WILLIAMSBRIDGE GARDENS
EAST 211TH – EAST 212TH STREET
BRONX, NEW YORK
NYSDEC BCP ID: C203113

REMEDIAL INVESTIGATION
WORK PLAN

SUBMITTED TO:

New York State Department of Environmental Conservation
Region 2
47-40 21st Street
Long Island City, New York 11101

PREPARED FOR:

B&B Urban LLC
419 Park Avenue South, 7th Floor
New York, New York 10019

PREPARED BY:

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PWGC Project Number: BBU1801

MARCH 2019

P.W. GROSSER CONSULTING, INC.
PROJECT No. BBU1801
New York State Department of Environmental Conservation
Brownfield Site No. C203113

REMEDIAL INVESTIGATION WORK PLAN

Williamsbridge Gardens
East 211th – East 212th Street
Bronx, New York

SUBMITTED:
March 2019

PREPARED FOR:

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

ON BEHALF OF:

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419 Park Avenue South, 7th Floor
New York, New York 10019

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CERTIFICATION

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

I certify that all information and statements in this certification are true. I understand that a false statement made herein is punishable as Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

	3-15-2019
Signature	Date

It is a violation of Article 145 of New York State Education Law for any person to alter this document in any way without the express written verification of adoption by any New York State licensed engineer in accordance with Section 7209(2), Article 145, New York State Education Law.

1.0 INTRODUCTION

P.W. Grosser Consulting, Inc. (PWGC) has prepared the following Remedial Investigation Work Plan (RIWP) to outline procedures and a scope of work intended to delineate impacted areas of concern at the Site identified as Williamsbridge Gardens located at 718 to 728 East 212th Street, Bronx, New York.

The Applicants, B&B Urban LLC and 211 Residential Associates LLC, have been accepted into the New York State Department of Environmental Conservation's (NYSDEC) Brownfield Cleanup Program (BCP) as a volunteer as set forth in a Brownfield Cleanup Agreement (BCA), dated August 3, 2018 (Site No. C203113). As such, the proposed Remedial Investigation (RI) is intended to delineate potential areas of concern within the property boundary and evaluate whether off-site adjacent properties may be impacted.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Site is located at 718 East 212th Street in the Williamsbridge section of the Bronx, New York and is identified as Block 4657 and Lots 0042, 0067, 0069, 0071, and 0072 on the New York City Tax Map. The Site is approximately 35,000-square feet and is bounded by East 212th Street to the north, East 211th Street to the south, residential and commercial properties and Holland Avenue to the east, and commercial properties and White Plains Road to the west. Currently, the Site is vacant with the exception of one small (approx. 600 sq. ft.) storage building; the Site is unoccupied but was most recently used for storage of carnival equipment and rides.

A Vicinity Map is included as **Figure 1**. A Site Plan is included as **Figure 2**.

2.2 Site History

Lot 0042 (East 211th Street) has been vacant since at least 1897. Lots 0067, 0069, and 0071 were first developed in approximately 1918 as residential apartment buildings. The buildings on Lots 0067 and 0069 remained in place until approximately 1978, when they were demolished. The building on Lot 0071 was demolished at some point between 1950 and 1976. Lot 0072 was first developed in approximately 1918 with an auto repair shop. Between 1918 and 1935 it was redeveloped as a contractor storage garage/warehouse and residential dwelling. These buildings were demolished in approximately 2004. Lots 0042, 0067, 0069, and 0071 have been used for carnival ride/equipment storage and maintenance from approximately 1981 to the present. Lot 0072 has been vacant from approximately 2004 to the present.

Past site uses include residential (approx. 1918 to 1978), auto repair (approx. 1918) and contractor storage building (approx. 1935 to 2004).

Based on review of historical Sanborn Fire Insurance Maps, aerial photos, topographic maps, and city directories performed as part of PWGC's August 2017 Phase I ESA for the site, it appears the subject property was first developed in approximately 1908 with several residential apartment buildings. The site appears to have been used for residential purposes from that time through approximately 1978, at which point the existing structures were demolished; the site has been vacant since then and used for storage of carnival rides and equipment. No USTs were identified on Sanborn maps of the site.

2.3 Regional Geology/Hydrogeology

The geologic setting of New York City is well documented. Manhattan Island and the Bronx are underlain by tightly folded, metamorphic rocks. Erosion of these formations has resulted in the formation of northeast trending hills which are prominent in the northern sections of Manhattan. The bedrock beneath most of Manhattan and the Bronx is the Manhattan schist. The Inwood limestone does underlie two small areas in the northern half of the Manhattan island and a narrow belt of limestone is also present on the southeastern portion of the island near the East River. The Fordham gneiss also outcrops in a few locations on the northern half of the island. In most areas of Manhattan and the Bronx, bedrock is overlain by thin deposits of Pleistocene age glacial outwash deposits (sand and gravel).

2.4 Site Geology/Hydrogeology

Based on a January 2018 Phase II Environmental Site Assessment (ESA) performed by PWGC at the site, soils at the site consist primarily of silty and clayey sand with some gravel that extended from grade to the bedrock surface which was encountered at depths ranging from approximately 5 to 12 feet below grade.

Groundwater was not encountered in unconsolidated sediment above bedrock during the January 2018 Phase II ESA. Based on topography, if groundwater is present above bedrock, it likely flows in a westward direction toward the Bronx River. Groundwater flow within bedrock would be dependent on the orientation of fractures within the bedrock beneath the site.

A RI performed at an adjacent New York City Voluntary Cleanup Program (VCP) site (3560-3572 White Plains Road) in January 2014 did not encounter groundwater in unconsolidated sediment above bedrock. Bedrock was reportedly present at approximately 10 feet below grade at this site. The RI Report for this site cites a previous geotechnical investigation that encountered groundwater at approximately 14 to 16 feet below grade within bedrock.

2.5 Site Features

The project site elevation is approximately 100 feet above mean sea level and is generally level. The site is vacant with the exception of a small storage building. The property is unpaved.

2.6 Current and Future Site Use

The site is currently vacant with the exception of the 600-sf storage building. Development plans for the site consist of the demolition of the existing small structure, and construction of two new eight-story residential buildings with partial basements and a landscaped interior courtyard for residents. Combined, the buildings will be 171,000 square feet and contain 173 apartments (28 studio, 56 one-bedroom, 57 two-bedroom and 31 three-bedroom, plus one super's unit). The new buildings will be used for affordable housing, including at least 80% at rents below federal low-income housing tax credit rents, and with 30% formerly homeless families. The current zoning designation is R7A residential. The proposed use is consistent with existing zoning for the property. The goal of the cleanup at the site is to achieve Track 1 status; however, it is understood that the project may achieve Track 2 or Track 4.

2.7 Previous Environmental Reports

2.7.1 Phase I ESA (August 2017)

PWGC prepared a Phase I Environmental Site Assessment (ESA) in August 2017. The Phase I ESA identified the following Recognized Environmental Conditions (RECs) associated with the subject property:

- The site has been assigned an E-Designation for Hazardous Materials by the New York City Department of Planning.
- Chemical drums and containers were stored throughout the property. Staining and evidence of spillage was noted in the vicinity of where these containers were stored.
- Potential vapor encroachment related to offsite sources.

2.7.2 Phase II ESA (January 2018)

Based on the findings of the August 2017 Phase I ESA, PWGC performed a Phase II ESA for the site in January 2018 under the oversight of the NYCOER E-Designation program. The Phase II ESA is summarized below; data generated as part of the Phase II ESA will be incorporated into the RI Report for the site.

Geophysical Survey

A geophysical survey to identify potential underground storage tanks and/or other subsurface anomalies that may warrant additional investigation. Due to the presence of equipment, trailers, and vehicles stored on-site, the geophysical survey was limited to approximately half of the subject property. Geophysical services were

provided by Delta Geophysics of Catasauqua, Pennsylvania (Delta) under the oversight of PWGC. A split-box electromagnetic metal detection instrument and ground penetrating radar (GPR) were used to perform the geophysical survey. The geophysical survey did not identify subsurface anomalies within the accessible portions of the property.

A copy of the Geophysical Survey Report is included as **Appendix A**.

Soil Borings and Sampling

A total of 12 soil borings were installed throughout the site to evaluate subsurface soil quality. At each boring location, soils were collected continuously from grade to bedrock (depths ranging from approximately 5 to 12 feet below grade). Soil borings were installed using a Geoprobe® direct-push drill rig outfitted with a five-foot macro-core sampler and disposable acetate liners. Non-dedicated sampling equipment was decontaminated with a laboratory grade detergent and clean water rinse. Groundwater was not encountered during drilling activities at the site.

Collected soils were field screened for the presence of volatile organic compounds (VOCs) with a photo-ionization detector (PID). At each boring location two soils samples were collected: one from the 0 to 2-foot interval and one from the two-foot interval immediately above the bedrock surface. Samples were analyzed for VOCs, semi-volatile organic compounds (SVOCs), metals, pesticides and PCBs. Quality control samples including blind duplicates, matrix spike/matrix spike duplicates (MS/MSD) and filed blanks were collected as well.

VOCs were not detected at concentrations exceeding Restricted Residential SCOs ("RRSCO") in soil samples collected from the site. With the exception of acetone in the 0 to 2 foot samples collected from soil borings SB004 and SB005, VOCs were not detected at concentrations exceeding Unrestricted Use SCOs (UUSCOs) in samples collected from the site.

SVOCs were detected at concentrations exceeding RRSCOs in shallow samples (0 to 2 feet) collected from soil borings SB003, SB005, SB006, SB007, and SB010, and the deep sample (7 to 9 feet) collected from soil boring SB004. The compounds detected at these locations included benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-cd)pyrene. At several of the boring locations listed above, chrysene was

detected at a concentration exceeding its UUSCO, but below its RRSCO; no additional SVOCs were detected above their respective UUSCOs in soil samples collected from the site. With the exception of location SB004, SVOCs in excess of RRSCOs were limited to the 0 to 2 foot interval in samples collected from the site.

Metals were detected at concentrations exceeding their respective UUSCOs and RRSCOs at multiple boring locations throughout the site as follows:

- Arsenic – SB007 (0 to 2 feet) exceeded RRSCO.
- Barium – SB010 (0 to 2 feet) and SB011 (0 to 2 feet) exceeded RRSCO.
- Beryllium – no RRSCO exceedances. SB010 (0 to 2 feet) exceeded UUSCO.
- Cadmium - SB007 (0 to 2 feet), SB010 (0 to 2 feet) and SB011 (0 to 2 feet) exceeded RRSCO.
- Chromium - SB010 (0 to 2 feet), and SB011 (0 to 2 feet) exceeded RRSCO. SB001 (8 to 10 feet), SB007 (0 to 2 feet), and SB008 (10 to 12 feet), and SB012 (6 to 8 feet) exceeded UUSCO.
- Copper - SB010 (0 to 2 feet) and SB011 (0 to 2 feet) exceeded RRSCO. SB006 (0 to 2 feet), SB007 (0 to 2 feet), SB009 (0 to 2 feet), SB009 (7 to 9 feet), and SB012 (6 to 8 feet) exceeded UUSCO.
- Lead – SB006 (0 to 2 feet), SB009 (0 to 2 feet), SB010 (0 to 2 feet), SB011 (0 to 2 feet) exceeded RRSCO. SB003 (0 to 2 feet, 7 to 9 feet), SB004 (0 to 2 feet, 7 to 9 feet), SB007 (0 to 2 feet), SB008 (0 to 2 feet), and SB012 (0 to 2 feet) exceeded UUSCO.
- Mercury – SB004 (7 to 9 feet) and SB009 (0 to 2 feet) exceed RRSCO. SB006 (0 to 2 feet) and SB012 (0 to 2 feet) exceed UUSCO.
- Nickel - SB010 (0 to 2 feet) and SB011 (0 to 2 feet) exceeded RRSCO. SB007 (0 to 2 feet), SB009 (7 to 9 feet), and SB012 (6 to 8 feet) exceeded UUSCO.
- Selenium - no RRSCO exceedances. SB010 (0 to 2 feet) exceeded UUSCO.
- Silver - no RRSCO exceedances. SB009 (0 to 2 feet) exceeded UUSCO.
- Zinc – no RRSCO exceedances. SB004 (7 to 9 feet), SB005 (0 to 2 feet), SB006 (0 to 2 feet), SB007 (0 to 2 feet), SB008 (0 to 2 feet), SB009 (0 to 2 feet), SB010 (0 to 2 feet), SB011 (0 to 2 feet), SB012 (0 to 2 feet).

With the exception of mercury at location SB004, metals in excess of RRSCOs were limited to the 0 to 2 foot interval in samples collected from the site.

Pesticides were not detected at concentrations exceeding their respective RRSCOs in samples collected from the site. Pesticides (4-4'-DDD, 4,4'-DDE, 4,4'-DDT, and/or dieldrin) were detected at concentrations exceeding their respective UUSCOs in samples collected from the 0 to 2-foot interval at locations SB004, SB005, SB006, SB007, SB008, SB009, SB010 and SB011, and the 7 to 9 foot interval at locations SB003 and SB004.

PCBs were not detected at concentrations exceeding their respective RRSCOs in samples collected from the site PCBs were detected at concentrations exceeding their respective UUSCOs in the samples collected from the 0 to 2-foot interval at locations SB007 and SB008.

Soil sample results are summarized in **Table 1** through **Table 4**, and **Figure 3**. Laboratory analytical reports are included as **Appendix B**. A Data Usability Summary Report (DUSR) is included as **Appendix C**.

Soil Vapor Sampling

Eight soil vapor probes were installed, and eight soil vapor samples were collected. Vapor points were installed approximately one to two feet above bedrock at each location. Temporary soil vapor points were installed utilizing a Geoprobe® direct-push drill rig. At each location, a six-inch stainless-steel screen was installed at the base of the sampling point with polyethylene tubing to grade. Coarse sand was placed surrounding the screen and six inches above. The remainder of the soil vapor point annulus was sealed with bentonite grout to the surface.

Soil vapor samples were collected approximately 24 hours after sampling points were installed. A tracer gas (helium) was utilized to test the seal around the soil vapor points. Once the integrity of the seal was confirmed at each location, three volumes of air were extracted from each point prior to sample collection with a flow rate of less than 0.2 liters/minute. Soil vapor samples were collected using batch certified 6-liter SUMMA vacuum canisters fitted with two-hour flow control regulators with a flow rate of less than 0.2 liters/minute. Methodologies used for soil vapor assessment conform to the NYSDOH Final Guidance on Soil Vapor Intrusion, October 2006.

PCE was detected in four of eight soil vapor samples with a maximum concentration of 39.3 ug/m^3, which is below the USEPA Vapor Intrusion Screening Level (VISL) Of 360 ug/m^3 for PCE. PCE was the sole compound for which NYSDOH has developed a soil vapor intrusion decision matrix detected in soil vapor at the site.

Soil vapor sample results are summarized in **Table 5** and **Figure 4**. Laboratory analytical reports are included as **Appendix B**. A Data Usability Summary Report (DUSR) is included as **Appendix C**.

3.0 STANDARDS, CRITERIA, AND GUIDANCE (SCGS)

Based on previous investigations at the site, the primary chemicals of potential concern (COPC) to be encountered at the site are SVOCs and metals related to the current/historical usage of the site for equipment storage, as well as the likely presence of historic urban fill material.

Applicable regulations at NYSDEC 6 NYCRR Part 375 provide soil cleanup objectives (SCOs) for Unrestricted Use, or restricted use based on the intended usage of the property. Restricted use SCOs include: Residential, Restricted Residential (single family houses not permitted), Commercial, or Industrial. The goal of the cleanup at the site is to achieve Track 1 status, therefore soil sample results will be compared to the Unrestricted Use SCOs. As the future intended use of the site is multi-family residential, soil sample results will also be compared to the Restricted Residential SCOs to evaluate a Track 2 cleanup in the event that Track 1 standards cannot be achieved.

Groundwater sample results will be compared to the NYSDEC Class GA Ambient Water Quality Standards (AWQS) as specified in the Technical Operation and Guidance Series (TOGS 1.1.1) Ambient Water Quality Standards and Guidance Values.

Soil vapor, indoor air and outdoor Air results will be compared to the USEPA Vapor Intrusion Screening Levels (VISL) for Soil Vapor.

4.0 OBJECTIVES, SCOPE AND RATIONALE

The primary objectives of the additional work detailed in this plan will be to collect the information and field data necessary to address data gaps pertaining to on-site issues. The Scope of Work includes the following tasks:

1. Additional characterization of onsite soils
2. Characterization of on-site groundwater
3. Confirmation of site-specific groundwater flow direction
4. On-site and off-site qualitative human health exposure evaluation

4.1 Additional Characterization of On-Site Soils

Soil sampling will be performed in accordance with the Division of Environmental Remediation (DER) DER-10 Technical Guidance for Site Investigation and Remediation, May 2010.

To further characterize subsurface conditions, soil borings will be installed throughout the property. A minimum of twelve borings will be installed. Soil borings will be installed in close proximity (i.e., within two to three feet) of the sample locations from the January 2018 Phase II ESA (see **Figure 3**), but will not be installed in the exact locations from January 2018 as installing borings in soil that was disturbed during previous sampling activities may not be representative of the site conditions. However, for ease of reference the boring IDs used in January 2018 (SB001 through SB012) will be re-used for borings installed as part of this RI.

Soil borings will be installed utilizing a Geoprobe® direct-push drill rig outfitted with a macro-core sampler and dedicated acetate liners. Soils will be collected continuously from ground surface to 20 feet below grade, the top of the water table, or until bedrock is encountered, whichever is shallower. Soils will be field screened for the presence of VOCs using a PID.

Samples will be collected from two-foot intervals between the depths characterized as part of the January 2018 Phase II ESA. In the event that borings installed during this RI extend beyond the depth at which refusal occurred during the January 2018 Phase II ESA, additional samples will be collected at two-foot intervals until bedrock is encountered.

A minimum of one soil sample from the intermediate depth intervals at each boring location will be submitted for laboratory analysis. Should deep samples be collected, a minimum of one soil sample from the deep interval(s) will be submitted for laboratory analysis as well. Samples will be submitted for analysis from the two-foot interval(s) exhibiting the most evidence of impact (e.g. PID response, staining, odor); in the event that no evidence of impact is identified, sample intervals will be selected from multiple depths across the site to allow for the characterization of multiple depth intervals. Anticipated sample intervals will be as follows:

Boring Locations	Intermediate Interval (ft bgs)	Deep Interval (ft bgs)
SB001	2 to 8	>10
SB002	2 to 7	>9
SB003	2 to 7	>9
SB004	2 to 7	>9
SB005	2 to 3	>5
SB006	2 to 7	>9
SB007	2 to 7	>9
SB008	2 to 10	>12
SB009	2 to 7	>9
SB010	2 to 7	>9
SB011	2 to 5	>7
SB012	2 to 6	>8

Soil samples will be analyzed for:

- VOCs by USEPA Method 8260
- SVOCs by USEPA Method 8270
- Pesticides/PCBs by USEPA Method 8081/8082
- Metals by USEPA Method 6010/7471

Soil samples collected for VOCs will be discrete samples (non-composite and non-homogenous) to minimize VOC loss. The additional soil intervals will be held pending the results of the first two intervals to determine if additional intervals will be analyzed.

4.2 Characterization of On-Site Groundwater

Groundwater sampling will be performed in accordance with the Division of Environmental Remediation (DER) Draft DER-10 Technical Guidance for Site Investigation and Remediation, May 2012.

To characterize groundwater quality beneath the site a minimum of three permanent monitoring wells will be installed. In the event that initial sampling of these three wells identifies groundwater impact above NYSDEC AWQS, additional wells may be necessary. The need for additional wells will be based upon consultation with NYSDEC following review of initial groundwater sampling data. Proposed monitoring well locations are illustrated in **Figure 5**.

4.2.1 Monitoring Well Construction

Monitoring wells will be installed using a rotary drill rig outfitted for air-rotary drilling. In the event that groundwater is not present in unconsolidated sediment, or shallow weathered bedrock, a four-inch outer casing will be installed to the bedrock surface and grouted in place, and borings will be cored through bedrock until groundwater is encountered. Monitoring wells will be constructed of two-inch diameter, schedule 40 PVC casing and screen with 0.010-inch slot. The wells will be constructed with a minimum 10-foot screen section and riser to grade unless precluded by hydrogeologic conditions. The well annulus will be filled with #2 morie sand (or equivalent), to two feet above the well screen. The screen will be set with a minimum of seven (7) feet into and three (3) feet above the water table at the time of installation. A two-foot fine sand layer will be installed above the screen followed by a two-foot bentonite seal. Above the bentonite layer, the annulus around the well will be filled with a cement/bentonite grout. A concrete surface pad (2 feet by 2 feet by 6-inch) will be installed. The wells will be finished with flush mount curb boxes and/or steel stickup casings. Monitoring well construction logs will be prepared for each monitoring well.

4.2.2 Vertical Delineation

In the event that chlorinated VOC (CVOC) impact to groundwater is detected above NYSDEC AWQSs in one or more monitoring well, and/or a potential source area of CVOC impact in soil (i.e., one or more soil samples containing CVOCs exceeding UUSCOs) is identified, PWGC will attempt to vertically delineate such impact.

Vertical delineation will consist of the installation of one cluster well located on the downgradient side of Lot 72 (see Section 4.3). The cluster well will be installed using the same methodology as the monitoring wells described in Section 4.2.1. Cluster wells will be constructed of one-inch diameter schedule 40 PVC with five-foot screen sections screen with 0.010-inch slot set at 10-foot intervals. The annulus around each screen section will be filled with #2 morie sand (or equivalent), to one foot above the well screen. A two-foot bentonite seal will be installed between each screen section. The wells will be finished with flush mount curb boxes and/or steel stickup casings. Monitoring well construction logs will be prepared for each monitoring well.

4.2.3 Monitoring Well Development

Following installation, monitoring wells will be developed by over-pumping to restore the hydraulic properties of the aquifer. Well development will continue until the turbidity of the groundwater is less than or equal to 50 Nephelometric Turbidity Units (NTUs), or when pH, temperature, and conductivity measurements stabilize. Stabilization is considered achieved when three consecutive readings of these field parameters are within five percent of each other over a period of 15 minutes. Monitoring well development water will be containerized for off-site disposal. New monitoring wells along with existing wells will be surveyed relative to an arbitrary on-site datum.

4.2.4 Monitoring Well Sampling

Groundwater samples will be collected in compliance with the United States Environmental Protection Agency (USEPA) Low Stress (Low Flow) Purging and Sampling Procedure for The Collection of Groundwater Samples From Monitoring Wells (September 2017). A copy of the procedure is included as **Appendix D**.

Groundwater samples will be analyzed for:

- VOCs by USEPA Method 8260
- SVOCs by USEPA Method 8270

- Pesticides/PCBs by USEPA Method 8081/8082
- Metals by USEPA Method 6010/7471 (filtered and unfiltered)

4.3 Determination of Site-Specific Groundwater Flow Direction

All monitoring wells top of casings and top of manways will be surveyed to a relative datum for the purposes of determining site-specific groundwater flow direction, if appropriate and not fracture flow. This information will be utilized on groundwater contour maps generated for the Remedial Investigation Report.

4.4 On-site and Off-site Qualitative Human Health Exposure Evaluation

A Qualitative Human Health Exposure Assessment will be completed for the site, characterizing the exposure setting, identifying exposure pathways, and evaluating contaminant fate and transport. The Qualitative Human Health Exposure Assessment will follow DER-10, appendix 3B and Section 3.3 (b) 8.

4.5 Emerging Contaminant Sampling

In accordance with NYSDEC requirements, soil and groundwater samples collected during this RI will be analyzed for 1,4-dioxane and perfluoroakyl and polyfluoroakyl substances (PFAS). The compounds are collectively referred to as “emerging contaminants”.

Based on the historical usage of the site (see Section 2.2), there is no reason to believe that 1,4-dioxane or PFAS are or were stored/used at the site in significant quantities.

During groundwater sampling described in Section 4.2, samples for emerging contaminants will be collected in accordance with the following NYSDEC guidance documents:

- Groundwater Sampling for Emerging Contaminants (July 2018)
- Collection of Groundwater Samples for Per- and Polyfluoroalkyl Substances (PFAS) from Monitoring Wells Sample Protocol (August 9, 2018)

Soil and groundwater samples will be analyzed for PFAS by USEPA Method 537 (modified) with a target analyte list as specified in the NYSDEC guidance documents specified above, and for 1,4-dioxane by USEPA Method 8270 (SIM Mode). In accordance with NYSDEC guidance, PFAS analysis will include the following compounds:

Compound Name	Acronym	CAS Number
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanessulfonic acid	PFOS	1763-23-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorononanoic acid	PFNA	375-95-1
Perfluorodecanoic acid	PFDA	335-76-2
Perfluoroundecanoic acid	PFUA/PFUdA	2058-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluorotridecanoic acid	PFTriA/PFTrDA	72629-94-8
Perfluorotetradecanoic acid	PFTA/PFTeDA	376-06-7
6:2 Fluorotelomer sulfonate	6:2 FTS	27619-97-2
8:2 Fluorotelomer sulfonate	8:2 FTS	39108-34-4
Perfluroroctanesulfonamide	FOSA	754-91-6
N-methyl perfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6

Quality assurance/quality control (QA/QC) procedures for emerging contaminant sampling are included in Section 5.0.

5.0 QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) presents the objectives, functional activities, methods, and QA/QC requirements associated with sample collection and laboratory analysis for characterization activities. The QAPP follows requirements detailed in DER-10, Section 2.

5.1 Project Organization

The investigative efforts defined in this RIWP will be implemented by PWGC on behalf of B&B Urban LLC. The following identifies the responsibilities of various organizations supporting the RI:

- The NYSDEC Project Manager (Mandy Yau) will be responsible for reviewing and approving this work plan, coordinating approval of requested modifications, and providing guidance on regulatory requirements.
- The PWGC Program Manager (James Rhodes and/or Paul Boyce) will provide technical expertise for review of the project plans, reports and ongoing field activities.
- The PWGC Quality Assurance Manager (Andrew Lockwood) will confirm the quality of work associated with the project is in accordance with all project plans.
- PWGC Project Manager (Thomas Melia) will be responsible for the day-to-day project management, task leadership, and project engineering support and for the planning and implementation of RI activities. The Project Manager is responsible for ensuring that the requirements of this RI work plan are implemented. The project manager will also act as the Site Health and Safety Manager (HSM).
- PWGC Field Team Leader (Kaitlyn Crosby or designee) will be responsible for sample collection, oversight of subcontractor personnel, and coordination of daily field activities. The Field Team Leader will act as the Site Health and Safety Officer ensuring implementation of the Site Health and Safety Plan.
- A NYSDOH Environmental Laboratory Accreditation Program (ELAP) certified laboratory (Alpha Analytical Laboratories of Westborough, Massachusetts ELAP ID 11148 and 11627) will be contracted to perform required analyses and reporting, including Analytical Services Protocol (ASP) Category B Deliverables, which will allow for data validation.
- An independent third-party data validator (Laboratory Data Consultants of Carlsbad, California) will be contracted to perform data validation and prepare a Data Usability Summary Report (DUSR) in accordance with Section 5.7.

- Subcontractors will perform surveying, drilling, and/or sampling at the direction of the Field Team Leader in accordance with this work plan.

Qualifications for the project team are included in **Appendix E**.

5.2 Laboratory Analysis

Requirements for sample analysis are described below. All samples will be submitted to a NYSDOH ELAP certified laboratory (Alpha Analytical) for analysis. Analytical methods, preservation, container requirements, and holding times are summarized below:

ANALYTICAL METHODS (SOIL)

Analyte/ Analyte Group	Matrix	Method/ SOP	Container(s) (number, size & type per sample)	Preservation	Preparation Holding Time	Analytical Holding Time	Estimated Number of Samples to be Collected
TAL Metals	Soil	EPA 6010C	1 x 2 oz, glass	Metals ex	6 months	6 months	12 to 24
TCL VOCs	Soil	EPA 8260C	3 x 40 ml VOA, glass vial	1 x Methanol 2 x DI H_2O Cool $\leq$ 6 ^oC	48 hours	14 Days	12 to 24
TCL SVOCs	Soil	EPA 8270D	1 x 8 oz, glass	Cool $\leq$ 6 ^oC	14 days	40 days	12 to 24
PCBs	Soil	EPA 8082A	1 x 8 oz, glass	Cool $\leq$ 6 ^oC	14 days	40 Days	12 to 24
Cyanide	Soil	EPA 9010C/9012B	1 x 250 ml, plastic	Cool $\leq$ 6 ^oC	14 days	14 days	12 to 24
Pesticides	Soil	EPA 8081B	1 x 8 oz, glass	Cool $\leq$ 6 ^oC	14 days	40 days	12 to 24
PFAS	Soil	EPA 537 (modified)	1 x 8 oz, glass	None	14 days	28 days	12 to 24
1,4-dioxane*	Soil	EPA 8270 (SIM)	1 x 8oz, glass	Cool $\leq$ 6 ^oC	14 days	40 days	12 to 24
*SIM Mode only necessary if EPA 8260 analysis cannot meet a MDL of 0.1 mg/kg							

ANALYTICAL METHODS (GROUNDWATER)

Analyte/ Analyte Group	Matrix	Method/ SOP	Container(s) (number, size & type per sample)	Preservation	Preparation Holding Time	Analytical Holding Time	Estimated Number of Samples to be Collected
Metals	Water	EPA 6020A	1 x 500 ml plastic	HNO_3	6 months	6 months	3
VOCs	Water	EPA 8260C	3 x 40 ml VOA, glass vial	HCl Cool $\leq$ 6 °C	48 hours	14 Days	3
SVOCs	Water	EPA 8270D	2 x 1000 ml, amber glass	Cool $\leq$ 6 °C	7 days	40 days	3
PCBs	Water	EPA 8082A	1 x 1000 ml, amber glass	Cool $\leq$ 6 °C	7 days	40 Days	3
Cyanide	Water	EPA 9010C/9012B	1 x 250 ml, plastic	NaOH	14 days	14 days	3
Pesticides	Water	EPA 8081B	1 x 500 ml, amber glass	Cool $\leq$ 6 °C	7 days	40 days	3
PFAS	Water	EPA 537 (modified)	3 x 250 ml HDPE, unlined cap	Trizma Cool < 6 °C	14 days	28 days	3
1,4-Dioxane*	Water	EPA 8270D SIM Mode	2 x 1000 ml, amber glass	Cool $\leq$ 6 °C	7 days	40 days	3
*SIM Mode to be used to meet required detection limit of 0.35 ug/L							

Laboratory Method Detection Limits (MDLs) and Reporting Limits (RLs) for PFAS analysis are detailed in the tables below:

PFAS MDLs & RLs (SOIL)

Analyte	CAS Number	RL (ng/g)	MDL (ng/g)
Perfluorobutanoic Acid (PFBA)	375-22-4	1	0.0213
Perfluoropentanoic Acid (PFPeA)	2706-90-3	1	0.01035
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	1	0.0635
Perfluorohexanoic Acid (PFHxA)	307-24-4	1	0.064
Perfluoroheptanoic Acid (PFHpA)	375-85-9	1	0.064
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	1	0.057
Perfluorooctanoic Acid (PFOA)	335-67-1	1	0.04105
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	1	0.198
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	1	0.136
Perfluorononanoic Acid (PFNA)	375-95-1	1	0.083
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	1	0.1205

Analyte	CAS Number	RL (ng/g)	MDL (ng/g)
Perfluorodecanoic Acid (PFDA)	335-76-2	1	0.072
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	1	0.275
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	1	0.103
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	1	0.056
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	1	0.097
Perfluorooctanesulfonamide (FOSA)	754-91-6	1	0.1025
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	1	0.09
Perfluorododecanoic Acid (PFDoA)	307-55-1	1	0.086
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	1	0.062
Perfluorotetradecanoic Acid (PFTA)	376-06-7	1	0.07
PFOA/PFOS, Total		1	0.04105

PFAS MDLs & RLs (GROUNDWATER)

Analyte	CAS Number	RL (ng/L)	MDL (ng/L)
Perfluorobutanoic Acid (PFBA)	375-22-4	2	0.3732
Perfluoropentanoic Acid (PFPeA)	2706-90-3	2	0.464
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	2	0.38
Perfluorohexanoic Acid (PFHxA)	307-24-4	2	0.492
Perfluoroheptanoic Acid (PFHpA)	375-85-9	2	0.372
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	2	0.436
Perfluorooctanoic Acid (PFOA)	335-67-1	2	0.46
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	2	0.194
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	2	0.52
Perfluorononanoic Acid (PFNA)	375-95-1	2	0.436
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	2	0.56
Perfluorodecanoic Acid (PFDA)	335-76-2	2	0.62
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	2	0.2908
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	2	0.2504
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	2	0.424
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	2	0.386
Perfluorooctanesulfonamide (FOSA)	754-91-6	2	0.556
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	2	0.3728
Perfluorododecanoic Acid (PFDoA)	307-55-1	2	0.592
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	2	0.314

Analyte	CAS Number	RL (ng/L)	MDL (ng/L)
Perfluorotetradecanoic Acid (PFTA)	376-06-7	2	0.988
PFOA/PFOS, Total		2	0.46

The laboratory standard operating procedures for PFAS analysis are included in **Appendix F**.

5.2.1 Soil Samples

Soil samples will be collected as described in Section 4.1. Analysis will conform to NYSDEC Analytical Services Protocol (ASP) Category B data deliverables in accordance with NYSDEC DER-10, Appendix 2B, 1.0 (b), including calibration standards, surrogate recoveries, and chromatograms.

5.2.2 Groundwater Samples

Groundwater samples will be collected as described in Section 4.2. Analysis will conform to NYSDEC Analytical Services Protocol (ASP) Category B data deliverables in accordance with NYSDEC DER-10, Appendix 2B, 1.0 (b), including calibration standards, surrogate recoveries, and chromatograms.

5.3 Field/Laboratory Data Control Requirements

Quality Control (QC) procedures will be followed in the field and at the laboratory to facilitate that reliable data are obtained. When performing field sampling, care shall be taken to prevent the cross-contamination of sampling equipment, sample bottles, and other equipment that could compromise sample integrity. QC samples will include the following:

- Blind Duplicates – one per 20 environmental samples for each matrix sampled.
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) - one per 20 environmental samples for each matrix sampled.
- Equipment Blank – one per day for each matrix sampled.
- Field Blank – one per day when PFAS samples are collected.
- Trip Blank – one per day.

ESTIMATED QA/QC SAMPLE FREQUENCY

QA/QC Sample Type	Est. Total Soil Samples	Est. Days of Soil Sampling	Est. Total Soil QA/QC Samples	Est. Total Groundwater Samples	Est. Days of Groundwater Sampling	Est. Total Groundwater QA/QC Samples
Blind Duplicate	12 to 24	2	1 to 2	3	1	1
MS/MSD	12 to 24	2	1 to 2	3	1	1
Equipment Blank	12 to 24	2	1 to 2	3	1	1
Field Blank	12 to 24	2	2	3	1	1
Trip Blank	12 to 24	2	2	3	1	1

QA/QC Sample analysis will conform to NYSDEC ASP Category B data deliverables in accordance with NYSDEC DER-10, Appendix 2B, 1.0 (b), including calibration standards, surrogate recoveries, and chromatograms.

5.4 Special Sampling Considerations for PFAS Sampling

There are several potential sources of PFAS that could contribute to the cross-contamination of environmental samples collected during the RI. Weatherproof clothing, pens, logbooks, cosmetics, personal hygiene products, insect repellents, and sampling equipment could contain PFAS that could lead to false positive sampling results.

To ensure that the analytical results obtained during the RI are representative of the actual site conditions several measures should be taken:

- Collection of appropriate field QA/QC samples (blanks, duplicates, equipment rinseate samples, etc.) as detailed in Section 5.3.
- Analysis by the analytical laboratory using established laboratory QA/QC procedures and methods as detailed in Section 5.3.
- During decon, non-dedicated equipment to be used for PFAS sampling will be rinsed with PFAS free water supplied by the laboratory. Equipment will be allowed to fully air dry before use.
- New high-density polyethylene (HDPE) tubing shall be used at each sample location.
- Groundwater samples will be collected in laboratory supplied HDPE containers.
- New nitrile gloves shall be worn between each sample interval.
- Only clean cotton or synthetic clothes shall be worn – preferably washed more than six times, and without the use of fabric softeners. No waterproof or insecticide treated clothing, boots or rain jackets

made or treated with Teflon products shall be used at the collection site. This includes all Gore-Tex® and Tyvek® products.

- Do not apply moisturizers or hand creams to hands or face on the day of sampling. No sunblock or insect repellants. Do not bring packaged food to the work site or use aluminum foil.
- Field notes shall be taken using a computer tablet or by using ink pens on non-water proof plain paper attached to a metal clipboard. Do not use Sharpies or markers. Transcribe field notes to Chain-of-Custody forms and official field books when back in the office after the collection process.
- For groundwater samples use only laboratory supplied 250 ml polypropylene sample bottles. Sample bottles should be pre-preserved by the laboratory, if dictated by the analysis method.
- Print labels before going into the field and apply to the sample containers.
- Use only laboratory supplied PFAS-free water for trip, field and equipment blanks.
- Place each sample container in a separate polypropylene zip-lock bag.
- For the shipping coolers, use only regular crushed ice packaged in polypropylene zip-lock plastic bags.
- Use only laboratory supplied shipping coolers that were used to ship sample containers for this project. Tape the cooler shut before shipping samples to the laboratory.

5.5 Sample Identification

Each sample will be identified with a set of information relating individual sample characteristics. Required information consists of Sample Designation, Depth, Date, Time, and Matrix. Examples of sample IDs are shown below.

- SB001(0-2') (soil sample, boring 001 from 0 to 2 feet)
- GW001(6-8') (groundwater sample, soil boring 001 from 6 to 8 feet)
- MW004 (groundwater sample, permanent monitoring well 004)
- CW001 (10-15') (groundwater sample, cluster well 001, 10 to 15 foot interval)
- SV001 (permanent soil vapor point 001
- SS001 (temporary sub-slab vapor point 001)
- IA001 (indoor air sample 001)
- AA001 (ambient air quality sample 001)

Sample frequency, locations, depths, and nomenclature may change subject to field decisions and professional judgment.

5.6 Chain-of-Custody, Sample Packaging and Shipment

Each day that samples are collected, a chain-of-custody/request for analysis form will be completed and submitted to the laboratory with samples to be analyzed. A copy of the chain-of-custody will be retained by the Project Manager. The chain-of-custody will include the project name, sampler's signature, sample IDs, date and time of sample collection, and analysis requested.

Samples will be packaged and shipped in a manner that maintains sample preservation requirements during transport (i.e., ice to keep samples cool until receipt at the laboratory), ensures that sample holding times can be achieved by the laboratory, and prevents samples from being tampered with.

If a commercial carrier ships samples, a bill of lading (waybill) will be used as documentation of sample custody. Receipts for bills of lading and other documentation of shipment shall be maintained as part of the permanent custody documentation. Commercial carriers are not required to sign the chain-of-custody as long as it is enclosed in the shipping container and evidence tape (custody seal) remains in place on the shipping container.

5.7 Data Usability and Validation

The main purpose of the data is for use in defining the extent of contamination at the site, to aid in evaluation of potential human health and ecological exposure assessments, and to support remedial action decisions. Based upon this, data usability and validation will be performed as described below. Complete data packages will be archived in the project files, and if deemed necessary additional validation can be performed using procedures in the following sections.

Data collected as part of the January 2018 Phase II ESA has been validated in accordance with Sections 5.6.1 and 5.6.2 (see **Appendix C**).

5.7.1 Data Usability and Validation Requirements

Data usability and validation are performed on analytical data sets, primarily to confirm that sampling and chain-of-custody documentation are complete, sample IDs can be tied to specific sampling locations, samples were

analyzed within the required holding times, and analyses are reported in conformance with NYSDEC ASP, Category B data deliverable requirements as applicable to the method utilized.

5.7.2 Data Usability and Validation Methods

A designee of the PWGC Project Manager will complete a data usability evaluation for the data collected during the RI and a data usability summary report (DUSR) will be prepared. The DUSR will be prepared in accordance with NYSDEC DER-10, Appendix 2B.

Independent third-party data validation will be performed on 5% of the sample data, or on one sample from each sample delivery group (SDG), whichever is greater. Data validation will be performed by a qualified subcontractor independent of the project.

5.8 Field Equipment Calibration

Equipment will be inspected and approved by the Field Team Leader before being used. Equipment will be calibrated to factory specifications, if required. Monitoring equipment will be calibrated following manufacturers recommended schedules. Daily field response checks and calibrations will be performed as necessary (i.e. PID calibrations) following manufacturers standard operating procedures. Equipment calibrations will be documented in a designated field logbook.

5.9 Equipment Decontamination

In order to minimize the potential for cross-contamination, non-dedicated drilling and sampling equipment shall be properly decontaminated prior to and between sampling/drilling locations.

5.9.1 General Procedures

Drilling equipment will be decontaminated in a designated area. Sampling equipment and probes will be decontaminated in an area covered with plastic sheeting near the sampling location. Waste material generated during decontamination activities will be containerized, stored and disposed of in accordance with the procedures detailed in Section 5.9. Decontamination of sampling equipment shall be kept to a minimum, and wherever possible, dedicated sampling equipment shall be used. Personnel directly involved in equipment decontamination shall wear appropriate personal protective equipment (PPE).

5.9.2 *Drilling Equipment*

Drilling equipment shall be decontaminated prior to performance of the first boring/excavation and between all subsequent borings/excavations. This shall include hand tools, casing, augers, drill rods, temporary well material and other related tools and equipment. Water used during drilling and/or steam cleaning operations shall be from a potable source.

5.9.3 *Sampling Equipment*

Sampling equipment (i.e., trowels, knives, split-spoons, bowls, hand augers, etc...) will be decontaminated prior to each use as follows:

- Laboratory-grade glassware detergent and tap water scrub to remove visual contamination
- Generous tap water rinse
- Distilled water rinse

5.9.4 *Meters and Probes*

All meters and probes that are used in the field (other than those used solely for air monitoring purposes, e.g., PID meters) will be decontaminated between uses as follows:

- Laboratory-grade detergent and tap water solution wash
- Tap water rinse
- Distilled water rinse (triple rinse)

5.10 Management of Investigation Derived Waste

Waste materials generated from the field operations may consist of soil and rock cuttings, purge water, and miscellaneous solid materials such as personal protective equipment (PPE) and supplies. Investigative derived waste (IDW) generated during field operations will be disposed of in accordance with applicable regulations.

Soil and rock cuttings generated from soil boring and well installation activities will be stored in 55-gallon drums. Drums will be labeled to indicate the source of the material and will be stored in a designated area on-site. Soil and/or rock cores and cuttings will be field screened using a PID, while performing drilling operations. Drummed material will be disposed of at an off-site disposal facility. Following receipt of the analytical results, recommendations for disposition of the drummed material will be provided to the NYSDEC.

Development and purge water generated during the field activities will be stored in a portable holding tank and/or 55-gallon drums. Drums will be labeled to indicate the source of the fluid and will be stored in a designated area on-site. Drummed groundwater will be sampled to determine if discharge to the surface of the site is appropriate or off-site disposal is required. Following receipt of the groundwater sampling results, recommendations for disposition of the water will be provided to NYSDEC.

5.11 Field Documentation

Documentation will take place on either appropriate forms or in a dedicated site logbook. Permanent black or blue ink will be used to record information in the logbook. Errors in field documentation will be lined through, initialed, dated, and corrected. Forms will be kept by the PWGC Field Team Leader during the field activities. Field activities will be documented in the field logbook. The logbook will contain waterproof pages that are consecutively numbered and be permanently bound with a hard cover. Upon completion of daily activities, unused portions of pages will be lined-through and initialed.

The primary purpose of the field logbook is to document the daily field activities and to provide descriptions of each activity. All entries in the field logbook will be recorded and dated by person making the entry.

6.0 REMEDIAL INVESTIGATION REPORT PREPARATION

The Remedial Investigation Report (RIR) will incorporate the methods and findings of the investigation activities performed as outlined in this work plan. The report will identify specific contamination concentrations throughout each media (e.g. soil, groundwater, etc.), delineate the extent of contamination in soil and groundwater, evaluate potential exposure pathways, and provide conclusions and recommendations for additional investigation and/or remedial action. Electronic copies of the Investigation Report will be submitted to the NYSDEC along with hard copies. Analytical results of the investigation will be submitted in the electronic data delivery (EDD) format through the Department's environmental information management system (EIMS).

7.0 HEALTH AND SAFETY

Field operations will be performed in accordance with the health and safety requirements to be provided in the site specific Health and Safety Plan (HASP). The HASP is included as **Appendix G**. The HASP outlines the requirements for training, medical surveillance, daily tailgate meetings, emergency response, and accident and injury reporting.

Activity hazard analyses (AHAs) have been completed for identified work activities planned for the investigation.

The PWGC Field Team Leader will be responsible for implementing the HASP, completing the daily tailgate safety meetings and performing necessary Industrial Hygiene (IH) monitoring as specified in the HASP.

8.0 COMMUNITY AIR MONITORING PLAN

A site-specific Community Air Monitoring Plan (CAMP) has been prepared to provide measures for protection for the downwind community from potential airborne contaminants as a direct result of the Remedial Investigation. The CAMP is included as **Appendix H**.

The Community Air Monitoring Plan will be implemented and executed in accordance with the New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan.

9.0 PROJECT SCHEDULE

The preliminary schedule for the major project milestones is presented in **Table 1**. Field work is anticipated to be completed in March 2019, following approval of this RIWP by NYSDEC. A draft RI Report should be submitted to the NYSDEC by April 2019.

10.0 REFERENCES

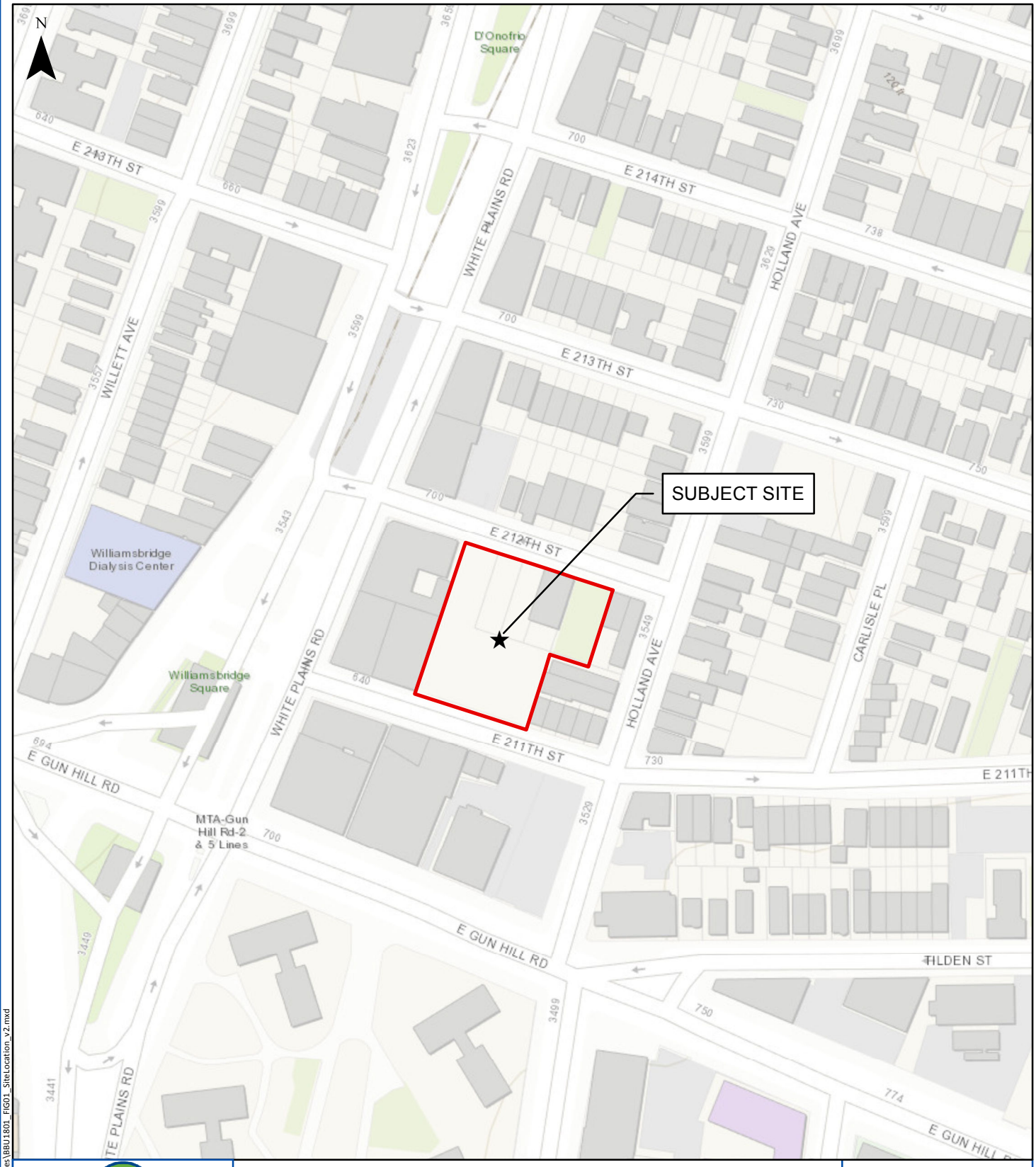
NYSDEC, Division of Environmental Restoration, 6 NYCRR Part 375 Subpart 6, Remedial Program Soil Cleanup Objectives

NYSDEC, Division of Environmental Remediation, May 2012, Draft DER-10, Technical Guidance for Site Investigation and Remediation.

NYSDEC, Division of Hazardous Waste Remediation, January 24, 1994, Memorandum # 4046, Technical and Administrative Guidance Memorandum #4046, Determination of Soil Cleanup Objectives and Cleanup Levels

NYSDEC, Division of Water, June 1998, Addendum April 2000, Technical and Operational Guidance Series 1:1:1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations

FIGURES



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Document Path: W:\Projects\A-D\CGCL1702\mapfiles\BBU1801_FIG01_SiteLocation_v2.mxd

SITE LOCATION

East 211th Street
Bronx, NY

0 75 150 300 450 Feet

Project:	BBU1801
Date:	1/17/2019
Designed by:	TM
Drawn by:	PH
Approved by:	TM
Figure No:	1

Document Path: W:\Projects\A-D\BBU\1801\mapfiles\BBU1801_FIG01_SitePlan.mxd

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DRAWING PREPARED FOR:

REVISION	DATE	INITIAL	COMMENTS

DRAWING INFORMATION:

Project:	BBU1801	Designed by:	TM
Date:	2/16/2018	Drawn by:	TS
Scale:	AS SHOWN	Approved by:	TM

SITE PLAN

EAST 211th Street
Bronx, NY

FIGURE NO:
2

N

WHITE PLAINS RD

EAST 212TH ST

EAST 211TH ST

HOLLAND AVE

SB001

SB002

SB003

SB004

SB005

SB006

SB007

SB008

SB009

SB010

SB011

SB012

LOCATION	SB001 (8-10)	
SAMPLING DATE	12/11/2017	
Metals		
Chromium, Total	34.6	
LOCATION	SB001 (0-2)	
SAMPLING DATE	12/11/2017	
no exceedances		

LOCATION	SB011 (0-2)	
SAMPLING DATE	12/14/2017	
Metals		
Barium, Total	418	
Cadmium, Total	4.79	
Chromium, Total	341	
Copper, Total	721	
Lead, Total	986	
Nickel, Total	341	
Zinc, Total	2110	
Pesticides		
4,4'-DDD	0.00348	
4,4'-DDE	0.0040	
4,4'-DDT	0.0253	
Dieldrin	0.00733	
LOCATION	SB011 (5-7)	
SAMPLING DATE	12/14/2017	
no exceedances		

LOCATION	SB010 (0-2)	
SAMPLING DATE	12/14/2017	
SVOCs		
Benzo(a)anthracene	1.4	
Benzo(a)pyrene	1.4	
Benzo(b)fluoranthene	1.8	
Chrysene	1.5	
Indeno(1,2,3-cd)pyrene	1	
Metals		
Barium, Total	650	
Beryllium, Total	15.8	
Cadmium, Total	6.53	
Chromium, Total	668	
Copper, Total	2160	
Lead, Total	1770	
Nickel, Total	1020	
Selenium, Total	9.68	
Zinc, Total	8000	
Pesticides		
4,4'-DDE	0.0132	
4,4'-DDT	0.062	
Dieldrin	0.0543	
LOCATION	SB010 (7-9)	
SAMPLING DATE	12/14/2017	
no exceedances		

LOCATION	SB012 (0-2)	
SAMPLING DATE	12/14/2017	
Metals		
Lead, Total	82.6	
Mercury, Total	0.24	
Zinc, Total	114	
LOCATION	SB012 (6-8)	
SAMPLING DATE	12/14/2017	
Metals		
Chromium, Total	36.7	
Copper, Total	57.1	
Nickel, Total	50.2	
Zinc, Total	117	

LOCATION	SB008 (0-2)	
SAMPLING DATE	12/14/2017	
Metals		
Lead, Total	186	
Zinc, Total	273	
Pesticides		
4,4'-DDD	0.0088	
4,4'-DDE	0.0619	
4,4'-DDT	0.0603	
PCBs		
PCBs, Total	0.185	J
LOCATION	SB008 (10-12)	
SAMPLING DATE	12/14/2017	
Metals		
Chromium, Total	42.8	

LOCATION	SB009 (0-2)	
SAMPLING DATE	12/14/2017	
Metals		
Copper, Total	120	
Lead, Total	624	
Mercury, Total	1.1	
Silver, Total	2.11	
Zinc, Total	714	
Pesticides		
4,4'-DDD	0.0035	
4,4'-DDT	0.0124	
LOCATION	SB009 (7-9)	
SAMPLING DATE	12/14/2017	
Metals		
Copper, Total	133	
Nickel, Total	85.6	

LOCATION	SB005 (0-2)	
SAMPLING DATE	12/14/2017	
VOCs		
Acetone	0.057	
SVOCs		
Benzo(a)anthracene	1.5	
Benzo(a)pyrene	1.4	
Benzo(b)fluoranthene	1.8	
Chrysene	1.7	
Indeno(1,2,3-cd)pyrene	0.88	
Metals		
Zinc, Total	126	
Pesticides		
4,4'-DDD	0.0246	
4,4'-DDE	0.0098	
4,4'-DDT	0.0127	P
LOCATION	SB005 (3-5)	
SAMPLING DATE	12/14/2017	
no exceedances		

LOCATION	SB006 (0-2)	
SAMPLING DATE	12/14/2017	
SVOCs		
Benzo(b)fluoranthene	1	
Indeno(1,2,3-cd)pyrene	0.54	
Metals		
Copper, Total	84.5	
Lead, Total	420	
Mercury, Total	0.45	
Zinc, Total	378	
Pesticides		
4,4'-DDD	0.0088	
4,4'-DDE	0.0056	P
LOCATION	SB006 (7.5-9.5)	
SAMPLING DATE	12/14/2017	
no exceedances		

LOCATION	SB007 (0-2)	
SAMPLING DATE	12/14/2017	
SVOCs		
Benzo(a)anthracene	1.4	
Benzo(a)pyrene	1.4	
Benzo(b)fluoranthene	1.7	
Chrysene	1.5	
Indeno(1,2,3-cd)pyrene	0.9	
Metals		
Arsenic, Total	19.6	
Cadmium, Total	10.7	
Chromium, Total	79.1	
Copper, Total	263	
Lead, Total	385	
Nickel, Total	109	
Zinc, Total	809	
Pesticides		
4,4'-DDD	0.0107	
4,4'-DDE	0.0092	
4,4'-DDT	0.0109	
PCBs		
PCBs, Total	0.12	J
LOCATION	SB007 (7-9)	
SAMPLING DATE	12/14/2017	
no exceedances		

LOCATION	SB004 (0-2)	
SAMPLING DATE	12/11/2017	
VOCs		
Acetone	0.058	
Metals		
Lead, Total	85.8	
Pesticides		
4,4'-DDT	0.0056	
LOCATION	SB004 (7-9)	
SAMPLING DATE	12/11/2017	
SVOCs		
Benzo(a)anthracene	1.2	
Benzo(b)fluoranthene	1.3	
Chrysene	1.1	
Indeno(1,2,3-cd)pyrene	0.6	
Metals		
Lead, Total	94.2	
Mercury, Total	7.6	
Zinc, Total	132	
Pesticides		
4,4'-DDT	0.0041	

LOCATION	SB003 (0-2)	
SAMPLING DATE	12/11/2017	
SVOCs		
Benzo(a)anthracene	1.4	
Benzo(a)pyrene	1.2	
Benzo(b)fluoranthene	1.6	
Chrysene	1.3	
Indeno(1,2,3-cd)pyrene	0.82	
Metals		
Lead, Total	76.3	
LOCATION	SB003 (7-9)	
SAMPLING DATE	12/11/2017	
Metals		
Lead, Total	80.4	
Pesticides		
4,4'-DDT	0.0061	P

no exceedances

0 50 100 150 200 Feet

Concentrations are mg/kg (ppm)

Yellow highlighted values exceed Unrestricted Use SCO

Orange highlighted values exceed Restricted Residential SCO

Soil Boring

Site Boundary

Proposed Cellar Footprint

Proposed Building Footprint

Adjacent Lots

PWGC

CLIENT DRIVEN SOLUTIONS

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DRAWING PREPARED FOR:

REVISION	DATE	INITIAL	COMMENTS

DRAWING INFORMATION:

Project:	BBU1801	Designed by:	KC
Date:	10/11/2018	Drawn by:	TS
Scale:	AS SHOWN	Approved by:	TM

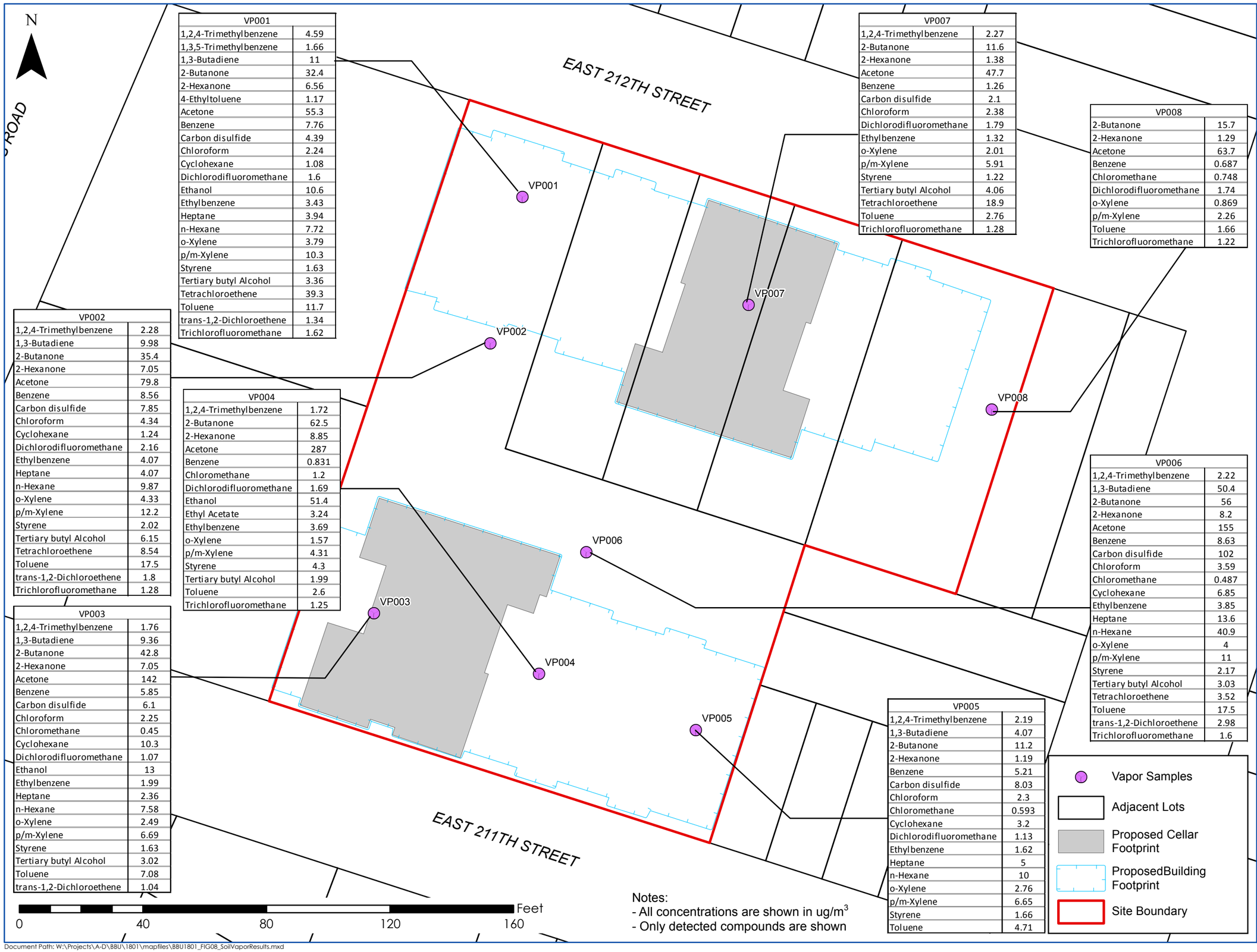
SOIL BORING RESULTS

EAST 211th Street
Bronx, NY

FIGURE NO:

3

Document Path: W:\Projects\A-D\BBU\1801\mapfiles\BBU1801_FIG07_Results.mxd



VP001	
1,2,4-Trimethylbenzene	4.59
1,3,5-Trimethylbenzene	1.66
1,3-Butadiene	11
2-Butanone	32.4
2-Hexanone	6.56
4-Ethyltoluene	1.17
Acetone	55.3
Benzene	7.76
Carbon disulfide	4.39
Chloroform	2.24
Cyclohexane	1.08
Dichlorodifluoromethane	1.6
Ethanol	10.6
Ethylbenzene	3.43
Heptane	3.94
n-Hexane	7.72
o-Xylene	3.79
p/m-Xylene	10.3
Styrene	1.63
Tertiary butyl Alcohol	3.36
Tetrachloroethene	39.3
Toluene	11.7
trans-1,2-Dichloroethene	1.34
Trichlorofluoromethane	1.62

VP002	
1,2,4-Trimethylbenzene	2.28
1,3-Butadiene	9.98
2-Butanone	35.4
2-Hexanone	7.05
Acetone	79.8
Benzene	8.56
Carbon disulfide	7.85
Chloroform	4.34
Cyclohexane	1.24
Dichlorodifluoromethane	2.16
Ethylbenzene	4.07
Heptane	4.07
n-Hexane	9.87
o-Xylene	4.33
p/m-Xylene	12.2
Styrene	2.02
Tertiary butyl Alcohol	6.15
Tetrachloroethene	8.54
Toluene	17.5
trans-1,2-Dichloroethene	1.8
Trichlorofluoromethane	1.28

VP003	
1,2,4-Trimethylbenzene	1.76
1,3-Butadiene	9.36
2-Butanone	42.8
2-Hexanone	7.05
Acetone	142
Benzene	5.85
Carbon disulfide	6.1
Chloroform	2.25
Chloromethane	0.45
Cyclohexane	10.3
Dichlorodifluoromethane	1.07
Ethanol	13
Ethylbenzene	1.99
Heptane	2.36
n-Hexane	7.58
o-Xylene	2.49
p/m-Xylene	6.69
Styrene	1.63
Tertiary butyl Alcohol	3.02
Toluene	7.08
trans-1,2-Dichloroethene	1.04

VP004	
1,2,4-Trimethylbenzene	1.72
2-Butanone	62.5
2-Hexanone	8.85
Acetone	287
Benzene	0.831
Chloromethane	1.2
Dichlorodifluoromethane	1.69
Ethanol	51.4
Ethyl Acetate	3.24
Ethylbenzene	3.69
o-Xylene	1.57
p/m-Xylene	4.31
Styrene	4.3
Tertiary butyl Alcohol	1.99
Toluene	2.6
Trichlorofluoromethane	1.25

VP005	
1,2,4-Trimethylbenzene	2.19
1,3-Butadiene	4.07
2-Butanone	11.2
2-Hexanone	1.19
Benzene	5.21
Carbon disulfide	8.03
Chloroform	2.3
Chloromethane	0.593
Cyclohexane	3.2
Dichlorodifluoromethane	1.13
Ethylbenzene	1.62
Heptane	5
n-Hexane	10
o-Xylene	2.76
p/m-Xylene	6.65
Styrene	1.66
Toluene	4.71

VP006	
1,2,4-Trimethylbenzene	2.22
1,3-Butadiene	50.4
2-Butanone	56
2-Hexanone	8.2
Acetone	155
Benzene	8.63
Carbon disulfide	102
Chloroform	3.59
Chloromethane	0.487
Cyclohexane	6.85
Ethylbenzene	3.85
Heptane	13.6
n-Hexane	40.9
o-Xylene	4
p/m-Xylene	11
Styrene	2.17
Tertiary butyl Alcohol	3.03
Tetrachloroethene	3.52
Toluene	17.5
trans-1,2-Dichloroethene	2.98
Trichlorofluoromethane	1.6

VP007	
1,2,4-Trimethylbenzene	2.27
2-Butanone	11.6
2-Hexanone	1.38
Acetone	47.7
Benzene	1.26
Carbon disulfide	2.1
Chloroform	2.38
Dichlorodifluoromethane	1.79
Ethylbenzene	1.32
o-Xylene	2.01
p/m-Xylene	5.91
Styrene	1.22
Tertiary butyl Alcohol	4.06
Tetrachloroethene	18.9
Toluene	2.76
Trichlorofluoromethane	1.28

VP008	
2-Butanone	15.7
2-Hexanone	1.29
Acetone	63.7
Benzene	0.687
Chloromethane	0.748
Dichlorodifluoromethane	1.74
o-Xylene	0.869
p/m-Xylene	2.26
Toluene	1.66
Trichlorofluoromethane	1.22

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Project:	BBU1801	Designed by:	TM
Date:	10/11/2018	Drawn by:	TS
Scale:	AS SHOWN	Approved by:	TM

SITE PLAN WITH SOIL VAPOR RESULTS

EAST 211th Street
Bronx, NY

FIGURE NO:

4

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Scale:	AS SHOWN	Approved by:	TM

PROPOSED MONITORING WELL LOCATIONS

EAST 211th Street
Bronx, NY

FIGURE NO:

5

Document Path: W:\Projects\A-D\BBU\1801\mapfiles\BBU1801_FIG05_Proposed_MW_Locations.mxd

TABLES

Table 1

Soil Sample Analaytical Data Summary - Volatile Organic Compounds
Henry Phipps Plaza South (Parcel 1) - 14RHAZ082M

LOCATION	CAS Number	Unrestricted Use SCO[1]	Restricted Residential SCO[2]	SB001 (0-2)	SB001 (8-10)	SB002 (0-2)	SB002 (7-9)	SB003 (0-2)	SB003 (7-9)	SB004 (0-2)	SB004 (7-9)	SB005 (0-2)	SB005 (3-5)	SB006 (0-2)	SB006 (7.5-9.5)	SB007 (0-2)	SB007 (7-9)	SB008 (0-2)	SB008 (10-12)	SB009 (0-2)	SB009 (7-9)	SB010 (0-2)	SB010 (7-9)	SB011 (0-2)	SB011 (5-7)	SB012 (0-2)	SB012 (6-8)	DUP001	DUP002
SAMPLING DATE				12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/11/2017	12/14/2017
LAB SAMPLE ID				L1745804-01	L1745804-02	L1745804-03	L1745804-04	L1745804-05	L1745804-06	L1745804-07	L1745804-08	L1746315-01	L1746315-02	L1746315-03	L1746315-04	L1746315-05	L1746315-06	L1746315-07	L1746315-08	L1746315-09	L1746315-10	L1746315-11	L1746315-12	L1746315-13	L1746315-14	L1746315-15	L1746315-16	L1745804-10	L1746315-17
Volatile Organic Compounds																													
1,1,1,2-Tetrachloroethane	630-20-6	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
1,1,1-Trichloroethane	71-55-6	0.68	100	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
1,1,2-Trichloroethane	79-00-5	NS	NS	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0026 U	0.002 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0021 U	0.0016 U	0.002 U	0.0014 U	0.002 U	0.0018 U	0.0016 U	0.0016 U	0.002 U	0.0014 U	0.0021 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.0019 U
1,1-Dichloroethane	75-34-3	0.27	26	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0026 U	0.002 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0021 U	0.0016 U	0.002 U	0.0014 U	0.002 U	0.0018 U	0.0016 U	0.0016 U	0.002 U	0.0014 U	0.0021 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.0019 U
1,1-Dichloroethene	75-35-4	0.33	100	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
1,1-Dichloropropene	563-58-6	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,2,3-Trichlorobenzene	87-61-6	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,2,3-Trichloropropane	96-18-4	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
1,2,4,5-Tetramethylbenzene	95-93-2	NS	NS	0.0046 U	0.0042 U	0.0045 U	0.0045 U	0.0069 U	0.0055 U	0.0048 U	0.00044 J	0.004 U	0.0038 U	0.0055 U	0.0043 U	0.0053 U	0.0037 U	0.0052 U	0.0047 U	0.0044 U	0.0044 U	0.0053 U	0.0036 U	0.0056 U	0.0043 U	0.0037 U	0.0037 U	0.0042 U	0.005 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,2,4-Trimethylbenzene	95-63-6	3.6	52	0.00027 J	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.00032 J	0.006 U	0.00039 J	0.00024 J	0.0048 U	0.00061 J	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0011 J	0.00082 J	0.0013 J	0.0007 J	0.0011 J	0.00074 J	0.00059 J	0.00057 J	0.0052 U	0.0014 J
1,2-Dibromo-3-chloropropane	96-12-8	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,2-Dibromoethane	106-93-4	NS	NS	0.0046 U	0.0042 U	0.0045 U	0.0045 U	0.0069 U	0.0055 U	0.0048 U	0.0059 U	0.004 U	0.0038 U	0.0055 U	0.0043 U	0.0053 U	0.0037 U	0.0052 U	0.0047 U	0.0044 U	0.0044 U	0.0053 U	0.0036 U	0.0056 U	0.0043 U	0.0037 U	0.0037 U	0.0042 U	0.005 U
1,2-Dichlorobenzene	95-50-1	1.1	100	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,2-Dichloroethane	107-06-2	0.02	3.1	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
1,2-Dichloroethene, Total	540-59-0	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
1,2-Dichloropropane	78-87-5	NS	NS	0.004 U	0.0037 U	0.0039 U	0.0039 U	0.006 U	0.0048 U	0.0042 U	0.0052 U	0.0036 U	0.0034 U	0.0048 U	0.0037 U	0.0046 U	0.0032 U	0.0046 U	0.0041 U	0.0038 U	0.0038 U	0.0047 U	0.0032 U	0.0049 U	0.0037 U	0.0033 U	0.0033 U	0.0037 U	0.0044 U
1,3,5-Trimethylbenzene	108-67-8	8.4	52	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.00026 J	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.00046 J	0.00035 J	0.00052 J	0.00028 J	0.00044 J	0.00026 J	0.00023 J	0.00023 J	0.0052 U	0.00061 J
1,3-Dichlorobenzene	541-73-1	2.4	49	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,3-Dichloropropane	142-28-9	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,3-Dichloropropene, Total	542-75-6	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
1,4-Dichlorobenzene	106-46-7	1.8	13	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
1,4-Dioxane	123-91-1	0.1	13	0.046 U	0.042 U	0.045 U	0.045 U	0.069 U	0.055 U	0.048 U	0.059 U	0.04 U	0.038 U	0.055 U	0.043 U	0.053 U	0.037 U	0.052 U	0.047 U	0.044 U	0.044 U	0.053 U	0.036 U	0.056 U	0.043 U	0.037 U	0.037 U	0.042 U	0.05 U
2,2-Dichloropropane	594-20-7	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
2-Butanone	78-93-3	0.12	100	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.0065 J	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
2-Hexanone	591-78-6	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
4-Methyl-2-pentanone	108-10-1	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
Acetone	67-64-1	0.05	100	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.0075 J	0.058	0.0067 J	0.057	0.0027 J	0.044	0.0045 J	0.013 U	0.0092 U	0.01 J	0.012 U	0.0072 J	0.011 U	0.013	0.0091 U	0.0069 J	0.0042 J	0.0093 U	0.0094 U	0.0064 J	0.017
Acrylonitrile	107-13-1	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
Benzene	71-43-2	0.06	4.8	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.00029 J	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.00033 J	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Bromobenzene	108-86-1	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
Bromochloromethane	74-97-5	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
Bromodichloromethane	75-27-4	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Bromoform	75-25-2	NS	NS	0.0046 U	0.0042 U	0.0045 U	0.0045 U	0.0069 U	0.0055 U	0.0048 U	0.0059 U	0.004 U	0.0038 U	0.0055 U	0.0043 U	0.0053 U	0.0037 U	0.0052 U	0.0047 U	0.0044 U	0.0044 U	0.0053 U	0.0036 U	0.0056 U	0.0043 U	0.0037 U	0.0037 U	0.0042 U	0.005 U
Bromomethane	74-83-9	NS	NS	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.003 U	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.0022 U	0.0022 U	0.0027 U	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0025 U
Carbon disulfide	75-15-0	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.002 J	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
Carbon tetrachloride	56-23-5	0.76	2.4	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Chlorobenzene	108-90-7	1.1	100	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Chloroethane	75-00-3	NS	NS	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.003 U	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.0022 U	0.0022 U	0.0027 U	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0025 U
Chloroform	67-66-3	0.37	49	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0026 U	0.002 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0021 U	0.0016 U	0.002 U	0.0014 U	0.002 U	0.0018 U	0.0016 U	0.0016 U	0.002 U	0.0014 U	0.0021 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.0019 U
Chloromethane	74-87-3	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
cis-1,2-Dichloroethene	156-59-2	0.25	100	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
cis-1,3-Dichloropropene	10061-01-5	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Dibromochloromethane	124-48-1	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Dibromomethane	74-95-3	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
Dichlorodifluoromethane	75-71-8	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
Ethyl ether	60-29-7	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
Ethylbenzene	100-41-4	1	41	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.00027 J	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.00027 J	0.0011 U	0.00031 J	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.00046 J
Hexachlorobutadiene	87-68-3	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
Isopropylbenzene	98-82-8	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Methyl tert butyl ether	1634-04-4	0.93	100	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.003 U	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.0022 U	0.0022 U	0.0027 U	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0025 U
Methylene chloride	75-09-2	0.05	100	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
n-Butylbenzene	104-51-8	12	100	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
n-Propylbenzene	103-65-1	3.9	100	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.00037 J	0.00027 J	0.00042 J	0.00021 J	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.00052 J
Naphthalene	91-20-3	12	100	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.00035 J	0.00037 J	0.00018 J	0.00055 J	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.00014 J	0.00028 J	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.00019 J
o-Chlorotoluene	95-49-8	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
o-Xylene	95-47-6	NS	NS	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.003 U	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.0022 U	0.0022 U	0.0027 U	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0025 U
p-Chlorotoluene	106-43-4	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
p-Diethylbenzene	105-05-5	NS	NS	0.0046 U	0.0042 U	0.0045 U	0.0045 U	0.0069 U	0.0055 U	0.0048 U	0.0059 U	0.004 U	0.0038 U	0.0055 U	0.0043 U	0.0053 U	0.0037 U	0.0052 U	0.0047 U	0.0044 U	0.0044 U	0.0053 U	0.0036 U	0.0056 U	0.0043 U	0.0037 U	0.0037 U	0.0042 U	0.005 U
p-Ethyltoluene	622-96-8	NS	NS	0.00027 J	0.0042 U	0.0045 U	0.0045 U	0.0069 U	0.0055 U	0.0048 U	0.0059 U	0.004 U	0.0038 U	0.00063 J	0.0043 U	0.0053 U	0.0037 U	0.0052 U	0.0047 U	0.0012 J	0.00088 J	0.0014 J	0.00072 J	0.0011 J	0.00078 J	0.00062 J	0.00059 J	0.0042 U	0.0015 J
p-Isopropyltoluene	99-87-6	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
p/m-Xylene	179601-23-1	NS	NS	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.00072 J	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.00056 J	0.00042 J	0.00075 J	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.00082 J
sec-Butylbenzene	135-98-8	11	100	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Styrene	100-42-5	NS	NS	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.003 U	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.0022 U	0.0022 U	0.0027 U	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0025 U
tert-Butylbenzene	98-06-6	5.9	100	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
Tetrachloroethene	127-18-4	1.3	19	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Toluene	108-88-3	0.7	100	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.00046 J	0.00028 J	0.0018 U	0.00093 J	0.0015 U	0.0014 U	0.0021 U	0.0016 U	0.002 U	0.0014 U	0.002 U	0.0018 U	0.0016 U	0.0016 U	0.00034 J	0.0014 U	0.0021 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.00026 J
trans-1,2-Dichloroethene	156-60-5	0.19	100	0.0017 U	0.0016 U	0.0017 U	0.0017 U	0.0026 U	0.002 U	0.0018 U	0.0022 U	0.0015 U	0.0014 U	0.0021 U	0.0016 U	0.002 U	0.0014 U	0.002 U	0.0018 U	0.0016 U	0.0016 U	0.002 U	0.0014 U	0.0021 U	0.0016 U	0.0014 U	0.0014 U	0.0016 U	0.0019 U
trans-1,3-Dichloropropene	10061-02-6	NS	NS	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
trans-1,4-Dichloro-2-butene	110-57-6	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
Trichloroethene	79-01-6	0.47	21	0.0011 U	0.001 U	0.0011 U	0.0011 U	0.0017 U	0.0014 U	0.0012 U	0.0015 U	0.001 U	0.00096 U	0.0014 U	0.0011 U	0.0013 U	0.00092 U	0.0013 U	0.0012 U	0.0011 U	0.0011 U	0.0013 U	0.00091 U	0.0014 U	0.0011 U	0.00093 U	0.00094 U	0.001 U	0.0012 U
Trichlorofluoromethane	75-69-4	NS	NS	0.0057 U	0.0052 U	0.0056 U	0.0056 U	0.0086 U	0.0068 U	0.006 U	0.0074 U	0.0051 U	0.0048 U	0.0069 U	0.0053 U	0.0066 U	0.0046 U	0.0066 U	0.0059 U	0.0055 U	0.0054 U	0.0067 U	0.0045 U	0.007 U	0.0053 U	0.0046 U	0.0047 U	0.0052 U	0.0063 U
Vinyl acetate	108-05-4	NS	NS	0.011 U	0.01 U	0.011 U	0.011 U	0.017 U	0.014 U	0.012 U	0.015 U	0.01 U	0.0096 U	0.014 U	0.011 U	0.013 U	0.0092 U	0.013 U	0.012 U	0.011 U	0.011 U	0.013 U	0.0091 U	0.014 U	0.011 U	0.0093 U	0.0094 U	0.01 U	0.012 U
Vinyl chloride	75-01-4	0.02	0.9	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.003 U	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.0022 U	0.0022 U	0.0027 U	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.0025 U
Xylenes, Total	1330-20-7	0.26	100	0.0023 U	0.0021 U	0.0022 U	0.0022 U	0.0034 U	0.0027 U	0.0024 U	0.00072 J	0.002 U	0.0019 U	0.0028 U	0.0021 U	0.0026 U	0.0018 U	0.0026 U	0.0023 U	0.00056 J	0.00042 J	0.00075 J	0.0018 U	0.0028 U	0.0021 U	0.0019 U	0.0019 U	0.0021 U	0.00082 J

Notes:
All Concentrations are ppm (mg/kg)
1 - Unrestricted Use SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
2 - Restricted Residential SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL).
U - Not detected at the reported detection limit for the sample.
NS - No standard established
NA - Analyte was not analyzed for
Yellow highlighted values exceed Unrestricted Use SCO
Orange highlighted values exceed Restricted Residential SCO

Table 2

Soil Sample Analaytical Data Summary - Semi-Volatile Organic Compounds
Henry Phipps Plaza South (Parcel 1) - 14RHAZ082M

LOCATION	CAS	Unrestricted	Restricted	SB001 (0-2)	SB001 (8-10)	SB002 (0-2)	SB002 (7-9)	SB003 (0-2)	SB003 (7-9)	SB004 (0-2)	SB004 (7-9)	SB005 (0-2)	SB005 (3-5)	SB006 (0-2)	SB006 (7.5-9.5)	SB007 (0-2)	SB007 (7-9)	SB008 (0-2)	SB008 (10-12)	SB009 (0-2)	SB009 (7-9)	SB010 (0-2)	SB010 (7-9)	SB011 (0-2)	SB011 (5-7)	SB012 (0-2)	SB012 (6-8)	DUP001	DUP002
SAMPLING DATE	Number	Use SCO[1]	Residential	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017
LAB SAMPLE ID			SCO[2]	L1745804-01	L1745804-02	L1745804-03	L1745804-04	L1745804-05	L1745804-06	L1745804-07	L1745804-08	L1746315-01	L1746315-02	L1746315-03	L1746315-04	L1746315-05	L1746315-06	L1746315-07	L1746315-08	L1746315-09	L1746315-10	L1746315-11	L1746315-12	L1746315-13	L1746315-14	L1746315-15	L1746315-16	L1745804-10	L1746315-17
Semi-Volatile Organic Compounds																													
1,2,4,5-Tetrachlorobenzene	95-94-3	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
1,2-Dichlorobenzene	95-50-1	1.1	100	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
1,3-Dichlorobenzene	541-73-1	2.4	49	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
1,4-Dichlorobenzene	106-46-7	1.8	13	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2,4,5-Trichlorophenol	95-95-4	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2,4,6-Trichlorophenol	88-06-2	NS	NS	0.11 U	0.11 U	0.12 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
2,4-Dichlorophenol	120-83-2	NS	NS	0.16 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.16 U	0.16 U	0.17 U	0.17 U	0.17 U	0.19 U	0.17 U	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U	0.17 U
2,4-Dimethylphenol	105-67-9	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2,4-Dinitrophenol	51-28-5	NS	NS	0.85 U	0.91 U	0.94 U	0.89 U	0.93 U	0.91 U	0.9 U	0.9 U	0.89 U	0.95 U	0.92 U	0.89 U	0.91 U	0.88 U	0.88 U	0.9 U	0.9 U	0.9 U	0.99 U	0.9 U	0.9 U	0.85 U	0.91 U	0.86 U	0.88 U	0.91 U
2,4-Dinitrotoluene	121-14-2	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2,6-Dinitrotoluene	606-20-2	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2-Chloronaphthalene	91-58-7	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2-Chlorophenol	95-57-8	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2-Methylnaphthalene	91-57-6	NS	NS	0.21 U	0.23 U	0.24 U	0.22 U	0.098 J	0.23 U	0.22 U	0.065 J	0.089 J	0.24 U	0.084 J	0.22 U	0.12 J	0.22 U	0.074 J	0.22 U	0.27	0.22 U	0.049 J	0.22 U	0.024 J	0.21 U	0.23 U	0.22 U	0.22 U	0.12 J
2-Methylphenol	95-48-7	0.33	100	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2-Nitroaniline	88-74-4	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
2-Nitrophenol	88-75-5	NS	NS	0.38 U	0.41 U	0.42 U	0.4 U	0.42 U	0.41 U	0.4 U	0.41 U	0.4 U	0.43 U	0.41 U	0.4 U	0.41 U	0.4 U	0.39 U	0.4 U	0.41 U	0.4 U	0.45 U	0.4 U	0.38 U	0.41 U	0.39 U	0.4 U	0.4 U	0.41 U
3,3'-Dichlorobenzidine	91-94-1	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
3-Methylphenol/4-Methylphenol	108-39-4	0.33	100	0.26 U	0.27 U	0.28 U	0.27 U	0.28 U	0.27 U	0.27 U	0.27 U	0.27 U	0.28 U	0.27 U	0.27 U	0.27 U	0.26 U	0.26 U	0.27 U	0.27 U	0.27 U	0.3 U	0.27 U	0.27 U	0.25 U	0.27 U	0.26 U	0.26 U	0.27 U
3-Nitroaniline	99-09-2	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
4,6-Dinitro-o-cresol	534-52-1	NS	NS	0.46 U	0.49 U	0.51 U	0.48 U	0.5 U	0.49 U	0.49 U	0.49 U	0.48 U	0.52 U	0.5 U	0.48 U	0.49 U	0.48 U	0.47 U	0.49 U	0.49 U	0.49 U	0.54 U	0.48 U	0.48 U	0.46 U	0.49 U	0.47 U	0.48 U	0.49 U
4-Bromophenyl phenyl ether	101-55-3	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
4-Chloroaniline	106-47-8	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
4-Chlorophenyl phenyl ether	7005-72-3	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
4-Nitroaniline	100-01-6	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.089 J	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.091 J	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
4-Nitrophenol	100-02-7	NS	NS	0.25 U	0.26 U	0.27 U	0.26 U	0.27 U	0.26 U	0.26 U	0.26 U	0.26 U	0.28 U	0.27 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.29 U	0.26 U	0.26 U	0.25 U	0.26 U	0.25 U	0.26 U	0.26 U
Acenaphthene	83-32-9	20	100	0.14 U	0.15 U	0.16 U	0.15 U	0.04 J	0.15 U	0.15 U	0.043 J	0.16	0.16 U	0.062 J	0.15 U	0.1 J	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.025 J	0.15 U	0.15 U	0.14 U	0.025 J	0.14 U	0.15 U	0.1 J
Acenaphthylene	208-96-8	100	100	0.14 U	0.15 U	0.19	0.15 U	0.88	0.077 J	0.056 J	0.68	0.077 J	0.16 U	0.078 J	0.15 U	0.29	0.15 U	0.095 J	0.15 U	0.074 J	0.15 U	0.4	0.15 U	0.059 J	0.14 U	0.12 J	0.14 U	0.15 U	0.16
Acetophenone	98-86-2	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.063 J	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.091 J	0.19 U	0.056 J	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Anthracene	120-12-7	100	100	0.11 U	0.11 U	0.11 J	0.11 U	0.54	0.062 J	0.11 U	0.51	0.42	0.12 U	0.18	0.11 U	0.4	0.11 U	0.066 J	0.11 U	0.082 J	0.11 U	0.29	0.11 U	0.037 J	0.11 U	0.1 J	0.11 U	0.11 U	0.32
Benzo(a)anthracene	56-55-3	1	1	0.11 U	0.11 U	0.34	0.11 U	1.4	0.12	0.1 J	1.2	1.5	0.058 J	0.85	0.11 U	1.4	0.11 U	0.32	0.11 U	0.42	0.11 U	1.4	0.11 U	0.11	0.11 U	0.54	0.11 U	0.11 U	0.94
Benzo(a)pyrene	50-32-8	1	1	0.14 U	0.15 U	0.31	0.15 U	1.2	0.16	0.1 J	0.93	1.4	0.053 J	0.8	0.15 U	1.4	0.15 U	0.36	0.15 U	0.34	0.15 U	1.4	0.15 U	0.13 J	0.14 U	0.52	0.14 U	0.15 U	0.83
Benzo(b)fluoranthene	205-99-2	1	1	0.11 U	0.11 U	0.4	0.11 U	1.6	0.24	0.14	1.3	1.8	0.063 J	1	0.11 U	1.7	0.11 U	0.5	0.11 U	0.52	0.11 U	1.8	0.11 U	0.18	0.11 U	0.74	0.11 U	0.11 U	1.2
Benzo(ghi)perylene	191-24-2	100	100	0.14 U	0.15 U	0.21	0.15 U	0.73	0.12 J	0.069 J	0.51	0.83	0.035 J	0.5	0.15 U	0.81	0.15 U	0.26	0.15 U	0.21	0.15 U	1	0.15 U	0.18	0.14 U	0.41	0.14 U	0.15 U	0.61
Benzo(k)fluoranthene	207-08-9	0.8	3.9	0.11 U	0.11 U	0.16	0.11 U	0.67	0.079 J	0.047 J	0.43	0.6	0.12 U	0.37	0.11 U	0.64	0.11 U	0.16	0.11 U	0.16	0.11 U	0.69	0.11 U	0.063 J	0.11 U	0.23	0.11 U	0.11 U	0.35
Benzoic Acid	65-85-0	NS	NS	0.58 U	0.61 U	0.64 U	0.6 U	0.63 U	0.61 U	0.61 U	0.61 U	0.6 U	0.64 U	0.62 U	0.6 U	0.61 U	0.59 U	0.59 U	0.61 U	0.61 U	0.61 U	0.67 U	0.6 U	0.6 U	0.57 U	0.61 U	0.58 U	0.59 U	0.61 U
Benzyl Alcohol	100-51-6	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Biphenyl	92-52-4	NS	NS	0.4 U	0.43 U	0.45 U	0.42 U	0.44 U	0.43 U	0.43 U	0.43 U	0.42 U	0.45 U	0.44 U	0.42 U	0.43 U	0.42 U	0.42 U	0.43 U	0.046 J	0.43 U	0.47 U	0.42 U	0.43 U	0.4 U	0.43 U	0.41 U	0.42 U	0.43 U
Bis(2-chloroethoxy)methane	111-91-1	NS	NS	0.19 U	0.2 U	0.21 U	0.2 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.21 U	0.21 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.22 U	0.2 U	0.2 U	0.19 U	0.2 U	0.19 U	0.2 U	0.2 U
Bis(2-chloroethyl)ether	111-44-4	NS	NS	0.16 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.16 U	0.16 U	0.17 U	0.17 U	0.17 U	0.19 U	0.17 U	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U	0.17 U
Bis(2-chloroisopropyl)ether	108-60-1	NS	NS	0.21 U	0.23 U	0.24 U	0.22 U	0.23 U	0.23 U	0.22 U	0.23 U	0.22 U	0.24 U	0.23 U	0.22 U	0.23 U	0.22 U	0.22 U	0.22 U	0.22 U	0.22 U	0.25 U	0.22 U	0.22 U	0.21 U	0.23 U	0.22 U	0.22 U	0.23 U
Bis(2-ethylhexyl)phthalate	117-81-7	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.083 J	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.077 J	0.19 U	2	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Butyl benzyl phthalate	85-68-7	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.056 J	0.19 U	0.19 U	0.07 J	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.59	0.19 U	0.31	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Carbazole	86-74-8	NS	NS	0.18 U	0.19 U	0.019 J	0.19 U	0.21	0.048 J	0.021 J	0.14 J	0.16 J	0.2 U	0.091 J	0.19 U	0.23	0.18 U	0.027 J	0.19 U	0.023 J	0.19 U	0.11 J	0.19 U	0.19 U	0.18 U	0.053 J	0.18 U	0.18 U	0.12 J
Chrysene	218-01-9	1	3.9	0.11 U	0.11 U	0.32	0.11 U	1.3	0.15	0.11	1.1	1.7	0.058 J	0.89	0.11 U	1.5	0.11 U	0.36	0.11 U	0.58	0.11 U	1.5	0.11 U	0.13	0.11 U	0.62	0.11 U	0.11 U	1
Di-n-butylphthalate	84-74-2	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.075 J	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.075 J	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Di-n-octylphthalate	117-84-0	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Dibenzo(a,h)anthracene	53-70-3	0.33	0.33	0.11 U	0.11 U	0.053 J	0.11 U	0.22	0.035 J	0.11 U	0.17	0.23	0.12 U	0.14	0.11 U	0.22	0.11 U	0.07 J	0.11 U	0.075 J	0.11 U	0.26	0.11 U	0.11 U	0.11 U	0.11	0.11 U	0.11 U	0.16
Dibenzofuran	132-64-9	7	59	0.18 U	0.19 U	0.2 U	0.19 U	0.12 J	0.19 U	0.19 U	0.11 J	0.069 J	0.2 U	0.036 J	0.19 U	0.13 J	0.18 U	0.025 J	0.19 U	0.04 J	0.19 U	0.023 J	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.074 J
Diethyl phthalate	84-66-2	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Dimethyl phthalate	131-11-3	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.87	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Fluoranthene	206-44-0	100	100	0.11 U	0.11 U	0.55	0.11 U	2.8	0.2	0.23	3	3.1	0.11 J	1.6	0.11 U	2.9	0.11 U	0.51	0.11 U	0.63	0.11 U	2.1	0.11 U	0.16	0.11 U	0.97	0.11 U	0.11 U	1.8
Fluorene	86-73-7	30	100	0.18 U	0.19 U	0.019 J	0.19 U	0.14 J	0.19 U	0.19 U	0.27	0.15 J	0.2 U	0.071 J	0.19 U	0.24	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.051 J	0.19 U	0.19 U	0.18 U	0.025 J	0.18 U	0.18 U	0.11 J
Hexachlorobenzene	118-74-1	0.33	1.2	0.11 U	0.11 U	0.12 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.12 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Hexachlorobutadiene	87-68-3	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Hexachlorocyclopentadiene	77-47-4	NS	NS	0.51 U	0.54 U	0.56 U	0.53 U	0.56 U	0.54 U	0.54 U	0.54 U	0.53 U	0.57 U	0.54 U	0.53 U	0.54 U	0.52 U	0.52 U	0.54 U	0.54 U	0.54 U	0.59 U	0.53 U	0.53 U	0.51 U	0.54 U	0.51 U	0.52 U	0.54 U
Hexachloroethane	67-72-1	NS	NS	0.14 U	0.15 U	0.16 U	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U	0.14 U	0.15 U	0.14 U	0.15 U	0.15 U
Indeno(1,2,3-cd)pyrene	193-39-5	0.5	0.5	0.14 U	0.15 U	0.21	0.15 U	0.82	0.13 J	0.071 J	0.6	0.88	0.039 J	0.54	0.15 U	0.9	0.15 U	0.28	0.15 U	0.23	0.15 U	1	0.15 U	0.16	0.14 U	0.42	0.14 U	0.15 U	0.62
Isophorone	78-59-1	NS	NS	0.16 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.16 U	0.16 U	0.17 U	0.17 U	0.17 U	0.19 U	0.17 U	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U	0.17 U
n-Nitrosodi-n-propylamine	621-64-7	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Naphthalene	91-20-3	12	100	0.18 U	0.19 U	0.2 U	0.19 U	0.2	0.19 U	0.19 U	0.14 J	0.11 J	0.2 U	0.083 J	0.19 U	0.2	0.18 U	0.082 J	0.19 U	0.15 J	0.19 U	0.052 J	0.19 U	0.19 U	0.18 U	0.023 J	0.18 U	0.18 U	0.17 J
NDPA/DPA	86-30-6	NS	NS	0.14 U	0.15 U	0.16 U	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U	0.14 U	0.15 U	0.14 U	0.15 U	0.15 U
Nitrobenzene	98-95-3	NS	NS	0.16 U	0.17 U	0.18 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.16 U	0.16 U	0.17 U	0.17 U	0.17 U	0.19 U	0.17 U	0.17 U	0.16 U	0.17 U	0.16 U	0.16 U	0.17 U
p-Chloro-m-cresol	59-50-7	NS	NS	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Pentachlorophenol	87-86-5	0.8	6.7	0.14 U	0.15 U	0.16 U	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.15 U	0.16 U	0.15 U	0.15 U	0.14 U	0.15 U	0.14 U	0.15 U	0.15 U
Phenanthrene	85-01-8	100	100	0.11 U	0.11 U	0.26	0.11 U	1.5	0.11	0.11	1.9	2.2	0.069 J	0.85	0.11 U	2.2	0.11 U	0.18	0.11 U	0.36	0.11 U	0.74	0.11 U	0.072 J	0.11 U	0.46	0.11 U	0.11 U	1.2
Phenol	108-95-2	0.33	100	0.18 U	0.19 U	0.2 U	0.19 U	0.19 U	0.19 U	0.19 U	0.19 U	0.18 U	0.2 U	0.19 U	0.19 U	0.19 U	0.18 U	0.18 U	0.19 U	0.19 U	0.19 U	0.21 U	0.19 U	0.19 U	0.18 U	0.19 U	0.18 U	0.18 U	0.19 U
Pyrene	129-00-0	100	100	0.11 U	0.11 U	0.46	0.11 U	2.2	0.21	0.18	2.2	2.9	0.088 J	1.4	0.11 U	2.5	0.11 U	0.48	0.11 U	0.58	0.11 U	2.2	0.11 U	0.17	0.11 U	0.9	0.11 U	0.11 U	1.5

Notes:
All Concentrations are ppm (mg/kg)
1 - Unrestricted Use SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
2 - Restricted Residential SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL).
U - Not detected at the reported detection limit for the sample.
NS - No standard established
NA - Analyte was not analyzed for
Yellow highlighted values exceed Unrestricted Use SCO
Orange highlighted values exceed Restricted Residential SCO

Table 3

Soil Sample Analaytical Data Summary - Total Metals
Henry Phipps Plaza South (Parcel 1) - 14RHAZ082M

LOCATION	CAS	Unrestricted	Restricted	SB001 (0-2)	SB001 (8-10)	SB002 (0-2)	SB002 (7-9)	SB003 (0-2)	SB003 (7-9)	SB004 (0-2)	SB004 (7-9)	SB005 (0-2)	SB005 (3-5)	SB006 (0-2)	SB006 (7.5-9.5)	SB007 (0-2)	SB007 (7-9)	SB008 (0-2)	SB008 (10-12)	SB009 (0-2)	SB009 (7-9)	SB010 (0-2)	SB010 (7-9)	SB011 (0-2)	SB011 (5-7)	SB012 (0-2)	SB012 (6-8)	DUP001	DUP002
SAMPLING DATE	Number	Use SCO1	Residential	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/11/2017	12/14/2017
LAB SAMPLE ID			SCO2	L1745804-01	L1745804-02	L1745804-03	L1745804-04	L1745804-05	L1745804-06	L1745804-07	L1745804-08	L1746315-01	L1746315-02	L1746315-03	L1746315-04	L1746315-05	L1746315-06	L1746315-07	L1746315-08	L1746315-09	L1746315-10	L1746315-11	L1746315-12	L1746315-13	L1746315-14	L1746315-15	L1746315-16	L1745804-10	L1746315-17
Metals																													
Aluminum, Total	7429-90-5	NS	NS	11000	11600	15200	9960	6470	8390	5930	5460	2090	12200	10800	10600	4750	9090	10200	12200	10100	10900	19400	12600	19800	11700	16600	23800	9180	12700
Antimony, Total	7440-36-0	NS	NS	4.11 U	4.39 U	4.59 U	4.4 U	4.54 U	4.49 U	4.4 U	4.58 U	0.359 J	4.7 U	2.29 J	0.387 J	6.5	4.3 U	1.63 J	4.47 U	26.3 J	0.387 J	9.39	4.39 U	9.42	4.36 U	0.918 J	4.12 U	4.27 U	3.33 J
Arsenic, Total	7440-38-2	13	16	0.847	1.5	2.48	0.616 J	5.32	3.75	3.15	3.45	6.4	2.99	5.22	1.79	19.6	0.74 J	2.54	0.68 J	6.63	0.686 J	4.96	0.65 J	9.34	0.488 J	2.8	0.346 J	1.49	7.2
Barium, Total	7440-39-3	350	400	109	80.7	91.4	67.2	72.1	109	76	65.9	123	39.5	225	76.6	160	81	284	58.8	322	67	650	98.7	418	95.1	144	204	41.5	428
Beryllium, Total	7440-41-7	7.2	72	0.773	0.8	0.634	0.669	0.318 J	0.386 J	0.255 J	0.275 J	0.242 J	0.254 J	0.486	0.683	1.5	0.645	0.442	0.814	0.427 J	0.378 J	15.8	0.545	5.46	0.47	0.726	0.767	0.418 J	0.601
Cadmium, Total	7440-43-9	2.5	4.3	0.822 U	0.879 U	0.919 U	0.88 U	0.907 U	0.897 U	0.88 U	0.916 U	0.171 J	0.941 U	0.799 J	0.126 J	10.7	0.163 J	0.277 J	0.125 J	1.42	0.88 U	6.53	0.879 U	4.79	0.871 U	0.262 J	0.124 J	0.854 U	1.97
Calcium, Total	7440-70-2	NS	NS	1950	1100	1400	1570	90800	33500	50300	57900	1680	1200	2790	1520	4000	1310	3480	1100	8800	2680	17000	1160	13300	1060	3590	2140	1050	7750
Chromium, Total	7440-47-3	30	180	25.9	34.6	24.3	25.5	9.34	11.6	10.1	11.8	4.54	19.4	24.9	25.8	79.1	23.9	21.1	42.8	26.1	16.2	668	29.9	341	20.5	25.1	36.7	16.8	37.1
Cobalt, Total	7440-48-4	NS	NS	12.1	12.2	9.44	13.3	3.23	3	3.25	3.56	2.75	5.98	8.17	11.7	21.8	13.7	8.11	14.6	7.82	21.5	451	17.7	111	12.7	9.12	28.6	6.8	12.8
Copper, Total	7440-50-8	50	270	27.6	30.4	12.8	23.5	12.1	16.9	11.5	28.2	28.4	13.6	84.5	22.8	263	22.7	40.5	25	120	133	2160	39.7	721	26.5	24.4	57.1	15	119
Iron, Total	7439-89-6	NS	NS	21800	21300	19200	21000	9340	7930	7940	9640	3060	14700	20800	21300	36300	20800	14900	24900	18700	23100	111000	21400	68100	18900	17300	32200	15100	29500
Lead, Total	7439-92-1	63	400	3.62 J	4.78	16.8	4.85	76.3	80.4	85.8	94.2	34.9	11.6	420	9.41	385	3.9 J	186	4.28 J	624	6.85	1770	12.7	986	4.44	82.6	5.05	7.69	477
Magnesium, Total	7439-95-4	NS	NS	4840	3910	3010	4030	14800	5060	3410	4340	238	2690	2910	4580	1000	4220	3350	4920	2860	14000	4410	4840	3730	4890	3790	12200	2220	4300
Manganese, Total	7439-96-5	1600	2000	968	693	490	624	149	192	140	194	20.7	172	681	552	255	628	392	631	320	408	641	400	358	329	604	579	417	693
Mercury, Total	7439-97-6	0.18	0.81	0.07 U	0.07 U	0.07 J	0.07 U	0.05 J	0.11	0.08	7.6	0.12	0.08 U	0.45	0.02 J	0.11	0.07 U	0.06 J	0.07 U	1.1	0.12	0.09	0.07 U	0.08	0.07 U	0.24	0.07 U	0.04 J	0.56
Nickel, Total	7440-02-0	30	310	22.3	18.8	14.5	17.2	8.74	6.97	10.6	10.6	8.15	11.2	15	17.9	109	18.6	14.4	17.2	23.6	85.6	1020	21.9	341	18.8	15.7	50.2	11.9	31.8
Potassium, Total	7440-09-7	NS	NS	2040	2480	706	2220	842	627	899	1080	187 J	476	1050	1700	408	2160	1270	1760	944	1300	1380	5270	3820	5660	972	12100	1260	2850
Selenium, Total	7782-49-2	3.9	180	1.64 U	1.76 U	1.84 U	1.76 U	1.81 U	1.79 U	1.76 U	1.83 U	0.26 J	0.499 J	1.02 J	0.558 J	2.42	0.422 J	0.459 J	0.572 J	0.64 J	0.554 J	9.68	0.395 J	2.34	0.488 J	0.551 J	0.717 J	1.71 U	1.02 J
Silver, Total	7440-22-4	2	180	0.822 U	0.879 U	0.919 U	0.88 U	0.907 U	0.897 U	0.88 U	0.916 U	0.898 U	0.941 U	0.868 U	0.899 U	0.912 U	0.86 U	0.866 U	0.894 U	2.11	0.88 U	1.02	0.879 U	0.848 U	0.871 U	0.875 U	0.824 U	0.854 U	0.897 U
Sodium, Total	7440-23-5	NS	NS	223	60.2 J	52.5 J	50.7 J	445	824	303	260	89.3 J	9.64 J	38.1 J	59.3 J	217	31.4 J	36.9 J	8.58 J	30.4 J	307	4600	42.8 J	1420	23.8 J	85.4 J	168	34.9 J	122 J
Thallium, Total	7440-28-0	NS	NS	1.64 U	1.76 U	1.84 U	1.76 U	1.81 U	1.79 U	1.76 U	1.83 U	1.8 U	1.88 U	1.74 U	1.8 U	1.82 U	1.72 U	1.73 U	1.79 U	1.78 U	1.76 U	2.72	1.76 U	0.695 J	1.74 U	1.75 U	1.65 U	1.71 U	1.79 U
Vanadium, Total	7440-62-2	NS	NS	40.2	40.5	35.5	33.5	14	15.2	16	15.1	11.8	32.4	32.5	35.1	24.3	33.8	27.4	44.6	29.3	27.8	36.8	38.6	39.6	34.1	33.5	60.6	25.1	38.1
Zinc, Total	7440-66-6	109	10000	53	51.5	51.1	53	53.5	93	105	132	126	34.9	378	58.9	809	50.5	273	68.2	714	51	8000	81.9	2110	49	114	117	33.7	662

Notes:
All Concentrations are ppm (mg/kg)
1 - Unrestricted Use SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
2 - Restricted Residential SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL).
U - Not detected at the reported detection limit for the sample.
NS - No standard established
NA - Analyte was not analyzed for
Yellow highlighted values exceed Unrestricted Use SCO
Orange highlighted values exceed Restricted Residential SCO

Table 4

Soil Sample Analaytical Data Summary - Pesticides and Polychlorinated Biphenyls
Henry Phipps Plaza South (Parcel 1) - 14RHAZ082M

LOCATION	CAS	Unrestricted	Restricted	SB001 (0-2)	SB001 (8-10)	SB002 (0-2)	SB002 (7-9)	SB003 (0-2)	SB003 (7-9)	SB004 (0-2)	SB004 (7-9)	SB005 (0-2)	SB005 (3-5)	SB006 (0-2)	SB006 (7.5-9.5)	SB007 (0-2)	SB007 (7-9)	SB008 (0-2)	SB008 (10-12)	SB009 (0-2)	SB009 (7-9)	SB010 (0-2)	SB010 (7-9)	SB011 (0-2)	SB011 (5-7)	SB012 (0-2)	SB012 (6-8)	DUP001	DUP002
SAMPLING DATE	Number	Use SCO1	Residential	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/11/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/14/2017	12/11/2017	12/14/2017
LAB SAMPLE ID			SCO2	L1745804-01	L1745804-02	L1745804-03	L1745804-04	L1745804-05	L1745804-06	L1745804-07	L1745804-08	L1746315-01	L1746315-02	L1746315-03	L1746315-04	L1746315-05	L1746315-06	L1746315-07	L1746315-08	L1746315-09	L1746315-10	L1746315-11	L1746315-12	L1746315-13	L1746315-14	L1746315-15	L1746315-16	L1745804-10	L1746315-17
Pesticides																													
4,4'-DDD	72-54-8	0.0033	13	0.00162 U	0.00181 U	0.00188 U	0.00174 U	0.00184 U	0.0014 J	0.00067 J	0.00181 J	0.0246	0.00181 U	0.00875	0.00173 U	0.0107	0.00173 U	0.00882	0.00172 U	0.00347	0.00174 U	0.00189 JPI	0.00175 U	0.00348	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.0104
4,4'-DDE	72-55-9	0.0033	8.9	0.00162 U	0.00181 U	0.00188 U	0.00174 U	0.00124 J	0.00215 J	0.00179	0.00174 J	0.00975	0.00181 U	0.0056 P	0.00173 U	0.00923	0.00173 U	0.0619	0.00172 U	0.0031 P	0.00174 U	0.0132	0.00175 U	0.0040	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.00473 P
4,4'-DDT	50-29-3	0.0033	7.9	0.00305 U	0.0034 U	0.00352 U	0.00327 U	0.00345 U	0.00606 P	0.00564	0.00408	0.0127 P	0.00339 U	0.00339 U	0.00325 U	0.0109	0.00324 U	0.0603	0.00322 U	0.0124	0.00326 U	0.062	0.00328 U	0.0253	0.00316 U	0.00323 U	0.00318 U	0.00325 U	0.00492
Aldrin	309-00-2	0.005	0.097	0.00162 U	0.00181 U	0.00188 U	0.00174 U	0.00184 U	0.00268 U	0.00179 U	0.00183 U	0.00174 U	0.00181 U	0.00181 U	0.00173 U	0.00184 U	0.00173 U	0.00168 U	0.00172 U	0.00177 U	0.00174 U	0.002 U	0.00175 U	0.00173 U	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.0018 U
Alpha-BHC	319-84-6	0.02	0.48	0.00068 U	0.00076 U	0.00078 U	0.00073 U	0.00077 U	0.00112 U	0.00075 U	0.00076 U	0.00073 U	0.00075 U	0.00075 U	0.00072 U	0.00077 U	0.00072 U	0.0007 U	0.00072 U	0.00074 U	0.00073 U	0.00083 U	0.00073 U	0.00072 U	0.0007 U	0.00072 U	0.00071 U	0.00072 U	0.00075 U
Beta-BHC	319-85-7	0.036	0.36	0.00162 U	0.00181 U	0.00188 U	0.00174 U	0.00184 U	0.00268 U	0.00179 U	0.00183 U	0.00174 U	0.00181 U	0.00181 U	0.00173 U	0.00184 U	0.00173 U	0.00168 U	0.00172 U	0.00177 U	0.00174 U	0.002 U	0.00175 U	0.00173 U	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.0018 U
Chlordane	57-74-9	NS	NS	0.0132 U	0.0147 U	0.0152 U	0.0142 U	0.015 U	0.045	0.0145 U	0.0149 U	0.128	0.0147 U	0.0147 U	0.0141 U	0.0569	0.014 U	0.0552	0.014 U	0.0474 P	0.0141 U	0.061	0.0142 U	0.012 J	0.0137 U	0.014 U	0.0138 U	0.0141 U	0.0634
cis-Chlordane	5103-71-9	0.094	4.2	0.00203 U	0.00227 U	0.00235 U	0.00218 U	0.0023 U	0.0073 P	0.00224 U	0.00229 U	0.0279	0.00226 U	0.0011 J	0.00216 U	0.00802 P	0.00216 U	0.0118	0.00215 U	0.00218 J	0.00218 U	0.0142 P	0.00218 U	0.00205 J	0.00211 U	0.00216 U	0.00212 U	0.00217 U	0.00308
Delta-BHC	319-86-8	0.04	100	0.00037 J	0.00181 U	0.00188 U	0.00099 J	0.00184 U	0.00268 U	0.00054 J	0.00108 J	0.00174 U	0.00181 U	0.00156 J	0.00173 U	0.00184 U	0.00173 U	0.00168 U	0.00172 U	0.00177 U	0.00174 U	0.002 U	0.00175 U	0.00173 U	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.0018 U
Dieldrin	60-57-1	0.005	0.2	0.00102 U	0.00113 U	0.00117 U	0.00109 U	0.00115 U	0.00342	0.00112 U	0.00269	0.00109 U	0.00113 U	0.00113 U	0.00108 U	0.00115 U	0.00108 U	0.00105 U	0.00107 U	0.00111 U	0.00109 U	0.0543	0.00109 U	0.00733	0.00105 U	0.00108 U	0.00106 U	0.00108 U	0.00112 U
Endosulfan I	959-98-8	2.4	24	0.00162 U	0.00181 U	0.00188 U	0.00174 U	0.00184 U	0.00268 U	0.00179 U	0.00183 U	0.00174 U	0.00181 U	0.00181 U	0.00173 U	0.00184 U	0.00173 U	0.00168 U	0.00172 U	0.00177 U	0.00174 U	0.002 U	0.00175 U	0.00173 U	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.0018 U
Endosulfan II	33213-65-9	2.4	24	0.00162 U	0.00181 U	0.00188 U	0.00174 U	0.00067 JPI	0.00268 U	0.00179 U	0.00183 U	0.00174 U	0.00181 U	0.00181 U	0.00173 U	0.00184 U	0.00173 U	0.00168 U	0.00172 U	0.00177 U	0.00174 U	0.002 U	0.00175 U	0.00173 U	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.0018 U
Endosulfan sulfate	1031-07-8	2.4	24	0.00068 U	0.00076 U	0.00078 U	0.00073 U	0.00077 U	0.00112 U	0.00075 U	0.00076 U	0.00073 U	0.00075 U	0.00075 U	0.00072 U	0.00077 U	0.00072 U	0.0007 U	0.00072 U	0.00074 U	0.00073 U	0.00083 U	0.00073 U	0.00072 U	0.0007 U	0.00072 U	0.00071 U	0.00072 U	0.00075 U
Endrin	72-20-8	0.014	11	0.00068 U	0.00076 U	0.00078 U	0.00073 U	0.00082 PI	0.00112 U	0.00075 U	0.00076 U	0.00073 U	0.00075 U	0.00075 U	0.00072 U	0.00077 U	0.00072 U	0.0007 U	0.00072 U	0.00074 U	0.00073 U	0.00083 U	0.00073 U	0.00072 U	0.0007 U	0.00072 U	0.00071 U	0.00072 U	0.00075 U
Endrin aldehyde	7421-93-4	NS	NS	0.00203 U	0.00227 U	0.00235 U	0.00218 U	0.0023 U	0.00335 U	0.00224 U	0.00229 U	0.00218 U	0.00226 U	0.00226 U	0.00216 U	0.0023 U	0.00216 U	0.0021 U	0.00215 U	0.00222 U	0.00218 U	0.0025 U	0.00218 U	0.00216 U	0.00211 U	0.00216 U	0.00212 U	0.00217 U	0.00224 U
Endrin ketone	53494-70-5	NS	NS	0.00162 U	0.00181 U	0.00188 U	0.00174 U	0.00184 U	0.00268 U	0.00179 U	0.00183 U	0.00174 U	0.00181 U	0.00181 U	0.00173 U	0.00184 U	0.00173 U	0.00168 U	0.00172 U	0.00177 U	0.00174 U	0.002 U	0.00175 U	0.00173 U	0.00168 U	0.00172 U	0.0017 U	0.00174 U	0.0018 U
Heptachlor	76-44-8	0.042	2.1	0.00081 U	0.00091 U	0.00094 U	0.00087 U	0.00092 U	0.00134 U	0.0009 U	0.00092 U	0.00087 U	0.0009 U	0.0009 U	0.00087 U	0.00092 U	0.00086 U	0.00084 U	0.00086 U	0.00089 U	0.00087 U	0.001 U	0.00087 U	0.00086 U	0.00084 U	0.00086 U	0.00085 U	0.00087 U	0.0009 U
Heptachlor epoxide	1024-57-3	NS	NS	0.00305 U	0.0034 U	0.00352 U	0.00327 U	0.00345 U	0.00502 U	0.00336 U	0.00344 U	0.00326 U	0.00339 U	0.00339 U	0.00325 U	0.00346 U	0.00324 U	0.00328 PI	0.00322 U	0.00211 J	0.00326 U	0.00254 J	0.00328 U	0.00324 U	0.00316 U	0.00323 U	0.00318 U	0.00325 U	0.00337 U
Lindane	58-89-9	0.1	1.3	0.00068 U	0.00076 U	0.00078 U	0.00073 U	0.00077 U	0.00112 U	0.00075 U	0.00076 U	0.00073 U	0.00075 U	0.00075 U	0.00072 U	0.00077 U	0.00072 U	0.0007 U	0.00072 U	0.00074 U	0.00073 U	0.00083 U	0.00073 U	0.00072 U	0.0007 U	0.00072 U	0.00071 U	0.00072 U	0.00075 U
Methoxychlor	72-43-5	NS	NS	0.00305 U	0.0034 U	0.00352 U	0.00327 U	0.00345 U	0.00502 U	0.00336 U	0.00344 U	0.00326 U	0.00339 U	0.00339 U	0.00325 U	0.00346 U	0.00324 U	0.00315 U	0.00322 U	0.00333 U	0.00326 U	0.00375 U	0.00328 U	0.00324 U	0.00316 U	0.00323 U	0.00318 U	0.00325 U	0.00337 U
Toxaphene	8001-35-2	NS	NS	0.0305 U	0.034 U	0.0352 U	0.0327 U	0.0345 U	0.0502 U	0.0336 U	0.0344 U	0.0326 U	0.0339 U	0.0339 U	0.0325 U	0.0346 U	0.0324 U	0.0315 U	0.0322 U	0.0333 U	0.0326 U	0.0375 U	0.0328 U	0.0324 U	0.0316 U	0.0323 U	0.0318 U	0.0325 U	0.0337 U
trans-Chlordane	5103-74-2	NS	NS	0.00203 U	0.00227 U	0.00235 U	0.00218 U	0.0023 U	0.00332 JPI	0.00224 U	0.00229 U	0.0218 PI	0.00226 U	0.00091 JPI	0.00216 U	0.00884 PI	0.00216 U	0.0113 P	0.00215 U	0.00357 PI	0.00218 U	0.0113 P	0.00218 U	0.00252 PI	0.00211 U	0.00216 U	0.00212 U	0.00217 U	0.00309 PI
Polychlorinated Biphenyls																													
Aroclor 1016	12674-11-2	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0378 U	0.0747 U	0.0364 U	0.038 U	0.0371 U	0.0381 U	0.0366 U	0.0368 U	0.0366 U	0.0366 U	0.0358 U	0.0355 U	0.0367 U	0.0369 U	0.0406 U	0.0357 U	0.0355 U	0.0355 U	0.0366 U	0.0355 U	0.0364 U	0.0364 U
Aroclor 1221	11104-28-2	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0378 U	0.0747 U	0.0364 U	0.038 U	0.0371 U	0.0381 U	0.0366 U	0.0368 U	0.0366 U	0.0366 U	0.0358 U	0.0355 U	0.0367 U	0.0369 U	0.0406 U	0.0357 U	0.0355 U	0.0355 U	0.0366 U	0.0355 U	0.0364 U	0.0364 U
Aroclor 1232	11141-16-5	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0378 U	0.0747 U	0.0364 U	0.038 U	0.0371 U	0.0381 U	0.0366 U	0.0368 U	0.0366 U	0.0366 U	0.0358 U	0.0355 U	0.0367 U	0.0369 U	0.0406 U	0.0357 U	0.0355 U	0.0355 U	0.0366 U	0.0355 U	0.0364 U	0.0364 U
Aroclor 1242	53469-21-9	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0508	0.0747 U	0.0364 U	0.038 U	0.0371 U	0.0381 U	0.0289 J	0.0368 U	0.0366 U	0.0366 U	0.0358 U	0.0355 U	0.0367 U	0.0369 U	0.0406 U	0.0357 U	0.0355 U	0.0355 U	0.0366 U	0.0355 U	0.0364 U	0.0364 U
Aroclor 1248	12672-29-6	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0378 U	0.0747 U	0.0364 U	0.038 U	0.0371 U	0.0381 U	0.0366 U	0.0368 U	0.0359 J	0.0366 U	0.0511	0.0355 U	0.0367 U	0.0369 U	0.0406 U	0.0357 U	0.0355 U	0.0355 U	0.0366 U	0.0355 U	0.0364 U	0.0281 J
Aroclor 1254	11097-69-1	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0131 J	0.0747 U	0.0364 U	0.038 U	0.0371 U	0.0381 U	0.0266 J	0.0368 U	0.0416 P	0.0366 U	0.0759	0.0355 U	0.0367 U	0.0369 U	0.0406 U	0.0357 U	0.0355 U	0.0355 U	0.0366 U	0.0355 U	0.0364 U	0.0277 J
Aroclor 1260	11096-82-5	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0378 U	0.0747 U	0.0364 U	0.038 U	0.0191 J	0.0381 U	0.0213 J	0.0368 U	0.03 J	0.0366 U	0.0425	0.0355 U	0.0682	0.0369 U	0.0396 J	0.0357 U	0.0355 U	0.0355 U	0.0277 J	0.0355 U	0.0364 U	0.0203 J
Aroclor 1262	37324-23-5	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0378 U	0.0747 U	0.0364 U	0.038 U	0.0371 U	0.0381 U	0.0366 U	0.0368 U	0.0366 U	0.0366 U	0.0358 U	0.0355 U	0.0367 U	0.0369 U	0.0406 U	0.0357 U	0.0355 U	0.0355 U	0.0366 U	0.0355 U	0.0364 U	0.0364 U
Aroclor 1268	11100-14-4	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0378 U	0.0747 U	0.0364 U	0.038 U	0.00886 J	0.0381 U	0.00861 J	0.0368 U	0.0124 J	0.0366 U	0.0156 J	0.0355 U	0.0367 U	0.0369 U	0.0173 J	0.0357 U	0.0355 U	0.0355 U	0.00753 J	0.0355 U	0.0364 U	0.012 J
PCBs, Total	1336-36-3	0.1	1	0.0354 U	0.0375 U	0.0375 U	0.0367 U	0.0639 J	0.0747 U	0.0364 U	0.038 U	0.028 J	0.0381 U	0.0854 J	0.0368 U	0.12 J	0.0366 U	0.185 J	0.0355 U	0.0682	0.0369 U	0.0569 J	0.0357 U	0.0355 U	0.0355 U	0.0352 J	0.0355 U	0.0364 U	0.0881 J

Notes:
All Concentrations are ppm (mg/kg)
1 - Unrestricted Use SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
2 - Restricted Residential SCO, 6NYCRR Part 375-6, Remediation Program Soil Cleanup Objectives
J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL).
U - Not detected at the reported detection limit for the sample.
P - The RPD between the results for the two columns exceeds the method-specified criteria.
NS - No standard established
NA - Analyte was not analyzed for
Yellow highlighted values exceed Unrestricted Use SCO
Orange highlighted values exceed Restricted Residential SCO

Table 5

Soil Vapor Sample Analaytical Data Summary - Volatile Organic Compounds
Henry Phipps Plaza South (Parcel 1) - 14RHAZ082M

LOCATION	CAS	NYSDOH	NYSDOH	VP001	VP002	VP003	VP004	VP005	VP006	VP007	VP008	AA001
SAMPLING DATE	Number	Decision	Sub-Slab	L1745989-01	L1745989-02	L1745989-03	L1745989-04	L1745989-05	L1745989-06	L1745989-07	L1745989-08	L1745989-09
LAB SAMPLE ID		Matrix1	Threshold2	43081	43081	43081	43081	43081	43081	43081	43081	43081
Volatile Organic Compounds												
1,1,1-Trichloroethane	71-55-6	B	100	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1,2,2-Tetrachloroethane	79-34-5	NS	NS	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U	1.37 U
1,1,2-Trichloroethane	79-00-5	NS	NS	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U	1.09 U
1,1-Dichloroethane	75-34-3	NS	NS	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,1-Dichloroethene	75-35-4	A	6	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
1,2,4-Trichlorobenzene	120-82-1	NS	NS	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U	1.48 U
1,2,4-Trimethylbenzene	95-63-6	NS	NS	4.59	2.28	1.76	1.72	2.19	2.22	2.27	0.983 U	1.85
1,2-Dibromoethane	106-93-4	NS	NS	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U	1.54 U
1,2-Dichlorobenzene	95-50-1	NS	NS	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,2-Dichloroethane	107-06-2	NS	NS	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U	0.809 U
1,2-Dichloropropane	78-87-5	NS	NS	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U	0.924 U
1,3,5-Trimethylbenzene	108-67-8	NS	NS	1.66	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
1,3-Butadiene	106-99-0	NS	NS	11	9.98	9.36	0.442 U	4.07	50.4	0.442 U	0.442 U	0.442 U
1,3-Dichlorobenzene	541-73-1	NS	NS	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dichlorobenzene	106-46-7	NS	NS	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
1,4-Dioxane	123-91-1	NS	NS	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
2,2,4-Trimethylpentane	540-84-1	NS	NS	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U	0.934 U
2-Butanone	78-93-3	NS	NS	32.4	35.4	42.8	62.5	11.2	56	11.6	15.7	1.47 U
2-Hexanone	591-78-6	NS	NS	6.56	7.05	7.05	8.85	1.19	8.2	1.38	1.29	0.82 U
3-Chloropropene	107-05-1	NS	NS	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U	0.626 U
4-Ethyltoluene	622-96-8	NS	NS	1.17	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U	0.983 U
4-Methyl-2-pentanone	108-10-1	NS	NS	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U	2.05 U
Acetone	67-64-1	NS	NS	55.3	79.8	142	287	2.38 U	155	47.7	63.7	4.85
Benzene	71-43-2	NS	NS	7.76	8.56	5.85	0.831	5.21	8.63	1.26	0.687	1.74
Benzyl chloride	100-44-7	NS	NS	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U	1.04 U
Bromodichloromethane	75-27-4	NS	NS	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U	1.34 U
Bromoform	75-25-2	NS	NS	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U	2.07 U
Bromomethane	74-83-9	NS	NS	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U	0.777 U
Carbon disulfide	75-15-0	NS	NS	4.39	7.85	6.1	0.623 U	8.03	102	2.1	0.623 U	0.623 U
Carbon tetrachloride	56-23-5	A	6	1.26 U	1.26 U	1.26 U	1.26 U	1.26 U	1.26 U	1.26 U	1.26 U	1.26 U
Chlorobenzene	108-90-7	NS	NS	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U	0.921 U
Chloroethane	75-00-3	NS	NS	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U	0.528 U
Chloroform	67-66-3	NS	NS	2.24	4.34	2.25	0.977 U	2.3	3.59	2.38	0.977 U	0.977 U
Chloromethane	74-87-3	NS	NS	0.413 U	0.413 U	0.45	1.2	0.593	0.487	0.413 U	0.748	1.08
cis-1,2-Dichloroethene	156-59-2	A	6	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U	0.793 U
cis-1,3-Dichloropropene	10061-01-5	NS	NS	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Cyclohexane	110-82-7	NS	NS	1.08	1.24	10.3	0.688 U	3.2	6.85	0.688 U	0.688 U	0.688 U
Dibromochloromethane	124-48-1	NS	NS	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Dichlorodifluoromethane	75-71-8	NS	NS	1.6	2.16	1.07	1.69	1.13	0.989 U	1.79	1.74	1.4
Ethanol	64-17-5	NS	NS	10.6	9.42 U	13	51.4	9.42 U	9.42 U	9.42 U	9.42 U	9.42 U
Ethyl Acetate	141-78-6	NS	NS	1.8 U	1.8 U	1.8 U	3.24	1.8 U	1.8 U	1.8 U	1.8 U	1.8 U
Ethylbenzene	100-41-4	NS	NS	3.43	4.07	1.99	3.69	1.62	3.85	1.32	0.869 U	2.5
Freon-113	76-13-1	NS	NS	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U	1.53 U
Freon-114	76-14-2	NS	NS	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
Heptane	142-82-5	NS	NS	3.94	4.07	2.36	0.82 U	5	13.6	0.82 U	0.82 U	0.82 U
Hexachlorobutadiene	87-68-3	NS	NS	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U	2.13 U
Isopropanol	67-63-0	NS	NS	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U	1.23 U	1.42
Methyl tert butyl ether	1634-04-4	NS	NS	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U	0.721 U
Methylene chloride	75-09-2	B	100	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U	1.74 U
n-Hexane	110-54-3	NS	NS	7.72	9.87	7.58	0.705 U	10	40.9	0.705 U	0.705 U	0.705 U
o-Xylene	95-47-6	NS	NS	3.79	4.33	2.49	1.57	2.76	4	2.01	0.869	0.869 U
p/m-Xylene	179601-23-1	NS	NS	10.3	12.2	6.69	4.31	6.65	11	5.91	2.26	1.74 U
Styrene	100-42-5	NS	NS	1.63	2.02	1.63	4.3	1.66	2.17	1.22	0.852 U	0.852 U
Tertiary butyl Alcohol	75-65-0	NS	NS	3.36	6.15	3.02	1.99	1.52 U	3.03	4.06	1.52 U	1.52 U
Tetrachloroethene	127-18-4	B	100	39.3	8.54	1.36 U	1.36 U	1.36 U	3.52	18.9	1.36 U	1.36 U
Tetrahydrofuran	109-99-9	NS	NS	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U	1.47 U
Toluene	108-88-3	NS	NS	11.7	17.5	7.08	2.6	4.71	17.5	2.76	1.66	0.81
trans-1,2-Dichloroethene	156-60-5	NS	NS	1.34	1.8	1.04	0.793 U	0.793 U	2.98	0.793 U	0.793 U	0.793 U
trans-1,3-Dichloropropene	10061-02-6	NS	NS	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U	0.908 U
Trichloroethene	79-01-6	A	6	1.07 U	1.07 U	1.07 U	1.07 U	1.07 U	1.07 U	1.07 U	1.07 U	1.07 U
Trichlorofluoromethane	75-69-4	NS	NS	1.62	1.28	1.12 U	1.25	1.12 U	1.6	1.28	1.22	1.12 U
Vinyl bromide	593-60-2	NS	NS	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U	0.874 U
Vinyl chloride	75-01-4	C	6	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U

Notes:
All Concentrations are ug/m^3
1 - Soil Vapor/Indoor Air Decision Matricies, NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York (May 2017 Update)
2 - This value indicates the soil vapor concentration below which no monitoring/mitigation would be required regardless of the corresponding indoor air concentration, based on the applicable NYSDOH Decision Matrix
J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL).
U - Not detected at the reported detection limit for the sample.
Yellow highlighted values exceed AWQS

Table 6
Project Schedule - Remedial Investigation

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Task																				
30 Day Public Comment Period																				
NYSDEC Approval of RIWP																				
Field Activities																				
Laboratory Analysis																				
Data Validation																				
Preparation of RI Report																				
Submission of Draft RI Report to NYSDEC																				
NYSDEC Interal Review of RI Report & 30 Day Public Comment Period																				

APPENDIX A
GEOPHYSICAL SURVEY REPORT

DELTA Geophysics Inc.

GEOPHYSICAL INVESTIGATION REPORT

SITE LOCATION

718 East 212th Street
Bronx, New York 10467

PREPARED FOR:

P.W. Grosser Consulting, Inc.

630 Johnson Avenue, Suite 7
Bohemia, New York 11716

PREPARED BY:

Dylan Morgenweck
Delta Geophysics Inc.
738 Front Street
Catasauqua, PA18032

December 11, 2017

Delta Geophysics, Inc. (Delta) is pleased to provide the results of the geophysical survey conducted at 718 East 212th Street Bronx, New York 10467.

1.0 INTRODUCTION

On December 11, 2017 Delta Geophysics personnel performed a limited geophysical investigation at 718 East 212th Street Bronx, New York 10467. The area of interest included all accessible portions of two lots. During the time of the survey, subsurface conditions were unknown; surface conditions consisted of soil, stone, and grass.

2.0 SCOPE OF WORK

The objective of this survey was to investigate the subsurface for anomalies consistent with underground storage tanks (UST) and/or former excavations. A secondary objective was to locate and mark all underground utilities within the survey area.

3.0 METHODOLOGY

Selection of survey equipment is dependent upon site conditions and project objectives. For this project the technician utilized the following equipment to survey the area of concern:

- Geophysical Survey Systems Inc. SIR-3000 cart-mounted Ground Penetrating Radar (GPR) unit with a 400 Mhz antenna.
- Radiodetection RD7000 precision utility locator.
- Fisher M-Scope TW-6 pipe and cable locator.

Ground penetrating radar (commonly called GPR) is a geophysical method that has been developed over the past thirty years for shallow, high-resolution, subsurface investigations of the earth. GPR uses high frequency pulsed electromagnetic waves (generally 10 MHz to 1,000 MHz) to acquire subsurface information. Energy is propagated downward into the ground and is reflected back to the surface from boundaries at which there are electrical property contrasts. GPR is a method that is commonly used for environmental, engineering, archeological, and other shallow investigations.

The GSSI SIR-3000 GPR can accept a wide variety of antennas which provide various depths of penetration and levels of resolution. The 400 MHz antenna can achieve depths of penetration up to about 20 feet, but this depth may be greatly reduced due to site-specific conditions. Signal penetration decreases with increased soil conductivity. Conductive materials attenuate or absorb the GPR signal. As depth increases the return signal becomes weaker. Penetration is the greatest in unsaturated sands and fine gravels. Clayey, highly saline or saturated soils, areas covered by steel reinforced concrete, foundry slag, of other highly conductive materials significantly reduces GPR depth of penetration.

The 400MHz antenna was configured to transmit to a depth of approximately 10 feet below the subsurface, but actual signal penetration was limited to approximately 1-3 feet below ground surface (bgs). The limiting factor was signal attenuation from near surface soils.
The RD7000 precision utility locator uses radio emission to trace the location of metal bearing utilities. This radio emission can be active or passive. Active tracing requires the attachment of a radio transmitter to the utility, passive tracing uses radio emissions that are present on the utility. Underground electrical utilities typically emit radio signals that this device can detect.

The TW-6 is designed to find pipes, cables and other metallic objects such as underground storage tanks. One surveyor can carry both the transmitter and receiver together, making it ideally suited for exploration type searches of ferrous metal masses. Metal detectors of this type operate by generating a magnetic field at the transmitter which causes metallic objects in the subsurface to generate a secondary magnetic field. The induced secondary field is detected by the receiver, which generates an audible tone equal to the strength of the secondary field.

4.0 SURVEY FINDINGS

All accessible areas within the designated survey areas were examined during this survey. The areas were surveyed with the TW-6 and GPR for potential anomalous features, and then surveyed with the RD7000 for potential subsurface utilities. Delta personnel did not locate any anomalies during the survey.

Site map (121117) is included outlining the survey areas and inaccessible areas.

5.0 SURVEY LIMITATIONS

GPR depth of penetration was limited to approximately 1-2 feet bgs. The limiting factor was due to conductive soils. The TW-6 was not able to be utilized within close proximity to metallic fences, storage containers, trailers, and buildings on site. Access throughout large portions of the site was limited by parked trailers, trucks, garbage, storage containers, and ice. The site was snow and ice covered at the time of survey, limiting surface accessibility and GPR depth of penetration.

6.0 WARRANTIES AND DISCLAIMER

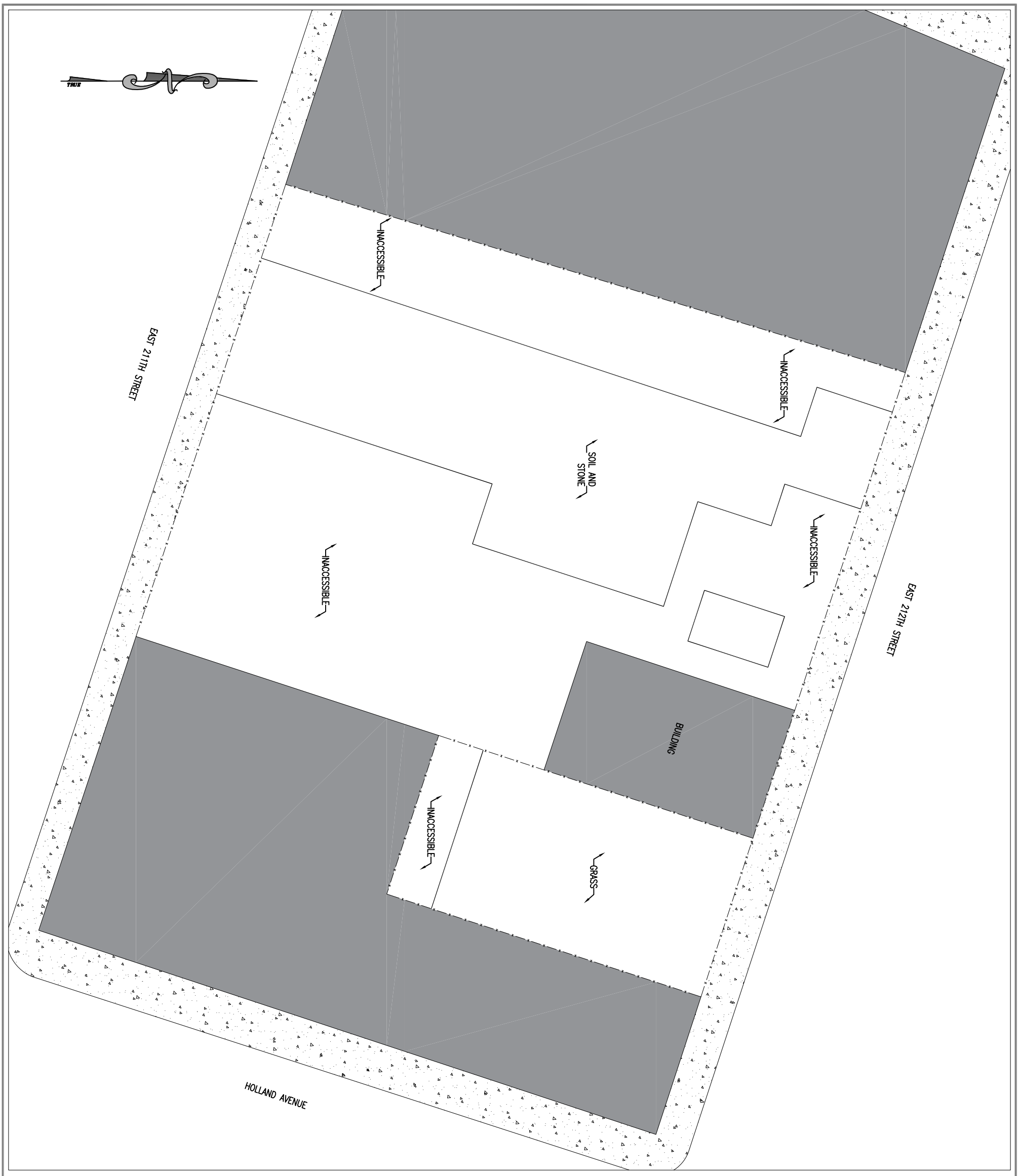
As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity to any anomalies indicated in this report. In addition, the absence of detected signatures does not preclude the possibility that targets may exist. To the extent the client desires more definitive conclusions than are warranted by the currently available facts; it is specifically Delta's intent that the conclusions stated herein will be intended as guidance.

This report is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based on the facts currently available within the limit or scope of work, budget and schedule. Delta represents that the services were performed in a manner consistent with currently accepted professional practices employed by geophysical/geological consultants under similar circumstances. No other representations to Client, express or implied, and no warranty or guarantee is included or intended in this agreement, or in any report, document, or otherwise.

This report was prepared pursuant to the contract Delta has with the Client. That contractual relationship included an exchange of information about the property that was unique and between Delta and its client and serves as the basis upon which this report was prepared. Because of the importance of the understandings between Delta and its client, reliance or any use of this report by anyone other than the Client, for whom it was prepared, is prohibited and therefore not foreseeable to Delta.

Reliance or use by any such third party without explicit authorization in the report does not make said third party a third party beneficiary to Delta's contract with the Client. Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at the third party's risk.

For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party.



NOTES:

This site plan was produced from data positioned by differential GPS measurments collected in the field. Due to the errors normally present in DGPS data, this document is not intended or represented to be of survey precision. Caution should be used in all field measurments based on this site plan.

As with any geophysical method, it must be stressed that caution be used during any excavation or intrusive testing in proximity of any anomalies indicated in this document The absence of detected signatures does not preclude the possibility that targets exist. The geophysical data and results presented in this site plan are based upon the application of scientific principles and professional judgements to certain facts with resultant subjective interpretations. Professional judgements expressed herein are based on the facts currently available within the limits of the existing data, scope of work, budget, and schedule.

Reliance or use by any such third party without explicit authorization in the document does not make said third party a third party benificiary to Delta's contract with the client. Any such unauthorized reliance on or use of this document, including any of its information or conclusions, will be at the third party's risk. For the same reasons, no warranties or representations, expressed or implied in this document, are made to any such third party.

0 15 30 60 90

GRAPHIC SCALE IN FEET

LEGEND

- MANHOLE COVER
- UTILITY POLE
- LIGHT POLE
- ELECTRIC
- GAS
- TELECOMMUNICATION
- STORM SEWER
- SANITARY SEWER
- WATER
- UNKNOWN UTILITY
- FENCE
- VENT LINE
- PRODUCT LINE
- RAILROAD TRACKS

DATE	12/11/17
SCALE	1'' = 30'
DWG NO.	121117
SHT NO.	1 OF 1
PROJECT.	

GEOPHYSICAL INVESTIGATION
718 EAST 212TH STREET BRONX, NEW YORK 10467
FOR
P.W. GROSSER CONSULTING, INC.

DELTA Geophysics Inc.
738 Front Street, Catasauqua, PA 18032
Phone: (610) 231-73012

APPENDIX B
LABORATORY ANALYTICAL REPORTS

ANALYTICAL REPORT

Lab Number:	L1745804
Client:	P. W. Grosser 630 Johnson Avenue Suite 7 Bohemia, NY 11716
ATTN:	Thomas Melia
Phone:	(631) 589-6353
Project Name:	BBU1702
Project Number:	BBU1702
Report Date:	12/21/17

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), NJ NELAP (MA935), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-14-00197).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1745804-01	SB001 (0-2)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 09:00	12/12/17
L1745804-02	SB001 (8-10)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 09:15	12/12/17
L1745804-03	SB002 (0-2)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 09:40	12/12/17
L1745804-04	SB002 (7-9)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 09:50	12/12/17
L1745804-05	SB003 (0-2)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 12:15	12/12/17
L1745804-06	SB003 (7-9)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 12:25	12/12/17
L1745804-07	SB004 (0-2)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 12:40	12/12/17
L1745804-08	SB004 (7-9)	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 12:50	12/12/17
L1745804-09	FIELD BLANK 001	WATER	718 E. 212TH ST., BRONX, NY	12/11/17 10:30	12/12/17
L1745804-10	DUP001	SOIL	718 E. 212TH ST., BRONX, NY	12/11/17 00:00	12/12/17
L1745804-11	TRIP BLANK	WATER	718 E. 212TH ST., BRONX, NY	12/11/17 00:00	12/12/17

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: BBU1702 **Lab Number:** L1745804
Project Number: BBU1702 **Report Date:** 12/21/17

Case Narrative (continued)

Report Submission
All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Volatile Organics
The WG1075119-5 Method Blank, associated with L1745804-04, -08, and -10, has a concentration above the reporting limit for bromomethane. Since the sample was non-detect to the RL for this target analyte, no further actions were taken. The results of the original analysis are reported.

Semivolatile Organics
The WG1073744-2/-3 LCS/LCSD recoveries, associated with L1745804-01 through -08 and -10, are below the acceptance criteria for benzoic acid (0%/0%); however, it has been identified as a "difficult" analyte. The results of the associated samples are reported.
The WG1073744-4/-5 MS/MSD recoveries, performed on L1745804-04, are below the acceptance criteria for benzoic acid (0%/0%) due to the concentration of this compound falling below the reported detection limit.

Total Metals
L1745804-01 through -08 and -10: The sample has elevated detection limits for all elements, with the exception of mercury, due to the dilution required by matrix interferences encountered during analysis.
L1745804-09: The Field Blank has a concentration above the reporting limit for calcium. The result was confirmed.
The WG1074609-3/-4 MS/MSD recoveries for aluminum (413%/1300%), iron (894%/3820%), magnesium (MSD 158%), and manganese (67%/220%), performed on L1745804-04, do not apply because the sample concentrations are greater than four times the spike amounts added.
The WG1074609-3/-4 MS/MSD recoveries, performed on L1745804-04, are outside the acceptance criteria for cadmium (60%/55%), calcium (MSD 161%), and potassium (MSD 134%). A post digestion spike was performed and yielded unacceptable recoveries for cadmium (65%) and potassium (74%). This has been attributed to sample matrix.

Project Name:	BBU1702	**Lab Number:**	L1745804
Project Number:	BBU1702	**Report Date:**	12/21/17

Case Narrative (continued)

The WG1074717-3/-4 MS/MSD recoveries, performed on L1745804-04, are outside the acceptance criteria for mercury (142%/142%). A post digestion spike was performed and yielded an unacceptable recovery of 122%. This has been attributed to sample matrix.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative Date: 12/21/17

ORGANICS

VOLATILES

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01
Client ID: SB001 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 09:00
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 15:00
Analyst: PK
Percent Solids: 94%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	1.9	1
1,1-Dichloroethane	ND		ug/kg	1.7	0.31	1
Chloroform	ND		ug/kg	1.7	0.42	1
Carbon tetrachloride	ND		ug/kg	1.1	0.39	1
1,2-Dichloropropane	ND		ug/kg	4.0	0.26	1
Dibromochloromethane	ND		ug/kg	1.1	0.20	1
1,1,2-Trichloroethane	ND		ug/kg	1.7	0.36	1
Tetrachloroethene	ND		ug/kg	1.1	0.34	1
Chlorobenzene	ND		ug/kg	1.1	0.40	1
Trichlorofluoromethane	ND		ug/kg	5.7	0.47	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.28	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	0.40	1
Bromodichloromethane	ND		ug/kg	1.1	0.35	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.24	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	0.26	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	0.24	1
1,1-Dichloropropene	ND		ug/kg	5.7	0.37	1
Bromoform	ND		ug/kg	4.6	0.27	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	0.34	1
Benzene	ND		ug/kg	1.1	0.22	1
Toluene	ND		ug/kg	1.7	0.22	1
Ethylbenzene	ND		ug/kg	1.1	0.19	1
Chloromethane	ND		ug/kg	5.7	0.50	1
Bromomethane	ND		ug/kg	2.3	0.38	1
Vinyl chloride	ND		ug/kg	2.3	0.36	1
Chloroethane	ND		ug/kg	2.3	0.36	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.42	1
trans-1,2-Dichloroethene	ND		ug/kg	1.7	0.27	1
Trichloroethene	ND		ug/kg	1.1	0.34	1
1,2-Dichlorobenzene	ND		ug/kg	5.7	0.21	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01 Date Collected: 12/11/17 09:00

Client ID: SB001 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.7	0.25	1
1,4-Dichlorobenzene	ND		ug/kg	5.7	0.21	1
Methyl tert butyl ether	ND		ug/kg	2.3	0.17	1
p/m-Xylene	ND		ug/kg	2.3	0.40	1
o-Xylene	ND		ug/kg	2.3	0.38	1
Xylenes, Total	ND		ug/kg	2.3	0.38	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.39	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	0.27	1
Dibromomethane	ND		ug/kg	11	0.27	1
Styrene	ND		ug/kg	2.3	0.46	1
Dichlorodifluoromethane	ND		ug/kg	11	0.57	1
Acetone	ND		ug/kg	11	2.6	1
Carbon disulfide	ND		ug/kg	11	1.2	1
2-Butanone	ND		ug/kg	11	0.78	1
Vinyl acetate	ND		ug/kg	11	0.17	1
4-Methyl-2-pentanone	ND		ug/kg	11	0.28	1
1,2,3-Trichloropropane	ND		ug/kg	11	0.20	1
2-Hexanone	ND		ug/kg	11	0.76	1
Bromochloromethane	ND		ug/kg	5.7	0.41	1
2,2-Dichloropropane	ND		ug/kg	5.7	0.51	1
1,2-Dibromoethane	ND		ug/kg	4.6	0.23	1
1,3-Dichloropropane	ND		ug/kg	5.7	0.21	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	0.36	1
Bromobenzene	ND		ug/kg	5.7	0.25	1
n-Butylbenzene	ND		ug/kg	1.1	0.26	1
sec-Butylbenzene	ND		ug/kg	1.1	0.25	1
tert-Butylbenzene	ND		ug/kg	5.7	0.28	1
o-Chlorotoluene	ND		ug/kg	5.7	0.25	1
p-Chlorotoluene	ND		ug/kg	5.7	0.21	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.7	0.45	1
Hexachlorobutadiene	ND		ug/kg	5.7	0.40	1
Isopropylbenzene	ND		ug/kg	1.1	0.22	1
p-Isopropyltoluene	ND		ug/kg	1.1	0.23	1
Naphthalene	ND		ug/kg	5.7	0.16	1
Acrylonitrile	ND		ug/kg	11	0.58	1
n-Propylbenzene	ND		ug/kg	1.1	0.24	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.7	0.28	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.7	0.24	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.7	0.18	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01 Date Collected: 12/11/17 09:00

Client ID: SB001 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.27	J	ug/kg	5.7	0.21	1
1,4-Dioxane	ND		ug/kg	46	16.	1
p-Diethylbenzene	ND		ug/kg	4.6	4.6	1
p-Ethyltoluene	0.27	J	ug/kg	4.6	0.27	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.6	0.18	1
Ethyl ether	ND		ug/kg	5.7	0.30	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.7	0.45	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	92		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	105		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02
Client ID: SB001 (8-10)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 09:15
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 15:26
Analyst: PK
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	10	1.7	1
1,1-Dichloroethane	ND		ug/kg	1.6	0.28	1
Chloroform	ND		ug/kg	1.6	0.39	1
Carbon tetrachloride	ND		ug/kg	1.0	0.36	1
1,2-Dichloropropane	ND		ug/kg	3.7	0.24	1
Dibromochloromethane	ND		ug/kg	1.0	0.18	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	0.33	1
Tetrachloroethene	ND		ug/kg	1.0	0.32	1
Chlorobenzene	ND		ug/kg	1.0	0.36	1
Trichlorofluoromethane	ND		ug/kg	5.2	0.44	1
1,2-Dichloroethane	ND		ug/kg	1.0	0.26	1
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.37	1
Bromodichloromethane	ND		ug/kg	1.0	0.32	1
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.22	1
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.24	1
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.22	1
1,1-Dichloropropene	ND		ug/kg	5.2	0.34	1
Bromoform	ND		ug/kg	4.2	0.25	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.31	1
Benzene	ND		ug/kg	1.0	0.20	1
Toluene	ND		ug/kg	1.6	0.20	1
Ethylbenzene	ND		ug/kg	1.0	0.18	1
Chloromethane	ND		ug/kg	5.2	0.46	1
Bromomethane	ND		ug/kg	2.1	0.35	1
Vinyl chloride	ND		ug/kg	2.1	0.33	1
Chloroethane	ND		ug/kg	2.1	0.33	1
1,1-Dichloroethene	ND		ug/kg	1.0	0.39	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	0.25	1
Trichloroethene	ND		ug/kg	1.0	0.32	1
1,2-Dichlorobenzene	ND		ug/kg	5.2	0.19	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02 Date Collected: 12/11/17 09:15

Client ID: SB001 (8-10) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.2	0.23	1
1,4-Dichlorobenzene	ND		ug/kg	5.2	0.19	1
Methyl tert butyl ether	ND		ug/kg	2.1	0.16	1
p/m-Xylene	ND		ug/kg	2.1	0.37	1
o-Xylene	ND		ug/kg	2.1	0.35	1
Xylenes, Total	ND		ug/kg	2.1	0.35	1
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.36	1
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.25	1
Dibromomethane	ND		ug/kg	10	0.25	1
Styrene	ND		ug/kg	2.1	0.42	1
Dichlorodifluoromethane	ND		ug/kg	10	0.52	1
Acetone	ND		ug/kg	10	2.4	1
Carbon disulfide	ND		ug/kg	10	1.2	1
2-Butanone	ND		ug/kg	10	0.72	1
Vinyl acetate	ND		ug/kg	10	0.16	1
4-Methyl-2-pentanone	ND		ug/kg	10	0.26	1
1,2,3-Trichloropropane	ND		ug/kg	10	0.18	1
2-Hexanone	ND		ug/kg	10	0.70	1
Bromochloromethane	ND		ug/kg	5.2	0.37	1
2,2-Dichloropropane	ND		ug/kg	5.2	0.47	1
1,2-Dibromoethane	ND		ug/kg	4.2	0.21	1
1,3-Dichloropropane	ND		ug/kg	5.2	0.19	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.33	1
Bromobenzene	ND		ug/kg	5.2	0.23	1
n-Butylbenzene	ND		ug/kg	1.0	0.24	1
sec-Butylbenzene	ND		ug/kg	1.0	0.23	1
tert-Butylbenzene	ND		ug/kg	5.2	0.26	1
o-Chlorotoluene	ND		ug/kg	5.2	0.23	1
p-Chlorotoluene	ND		ug/kg	5.2	0.19	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.2	0.42	1
Hexachlorobutadiene	ND		ug/kg	5.2	0.36	1
Isopropylbenzene	ND		ug/kg	1.0	0.20	1
p-Isopropyltoluene	ND		ug/kg	1.0	0.21	1
Naphthalene	ND		ug/kg	5.2	0.14	1
Acrylonitrile	ND		ug/kg	10	0.54	1
n-Propylbenzene	ND		ug/kg	1.0	0.22	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.2	0.26	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.2	0.22	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.2	0.17	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02 Date Collected: 12/11/17 09:15

Client ID: SB001 (8-10) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	5.2	0.20	1
1,4-Dioxane	ND		ug/kg	42	15.	1
p-Diethylbenzene	ND		ug/kg	4.2	4.2	1
p-Ethyltoluene	ND		ug/kg	4.2	0.24	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.2	0.16	1
Ethyl ether	ND		ug/kg	5.2	0.27	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.2	0.41	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	91		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	105		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03
Client ID: SB002 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 09:40
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 15:53
Analyst: PK
Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	1.8	1
1,1-Dichloroethane	ND		ug/kg	1.7	0.30	1
Chloroform	ND		ug/kg	1.7	0.41	1
Carbon tetrachloride	ND		ug/kg	1.1	0.38	1
1,2-Dichloropropane	ND		ug/kg	3.9	0.25	1
Dibromochloromethane	ND		ug/kg	1.1	0.20	1
1,1,2-Trichloroethane	ND		ug/kg	1.7	0.35	1
Tetrachloroethene	ND		ug/kg	1.1	0.34	1
Chlorobenzene	ND		ug/kg	1.1	0.39	1
Trichlorofluoromethane	ND		ug/kg	5.6	0.46	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.27	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	0.39	1
Bromodichloromethane	ND		ug/kg	1.1	0.34	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.23	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	0.26	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	0.23	1
1,1-Dichloropropene	ND		ug/kg	5.6	0.37	1
Bromoform	ND		ug/kg	4.5	0.26	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	0.33	1
Benzene	ND		ug/kg	1.1	0.22	1
Toluene	ND		ug/kg	1.7	0.22	1
Ethylbenzene	ND		ug/kg	1.1	0.19	1
Chloromethane	ND		ug/kg	5.6	0.49	1
Bromomethane	ND		ug/kg	2.2	0.38	1
Vinyl chloride	ND		ug/kg	2.2	0.35	1
Chloroethane	ND		ug/kg	2.2	0.35	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.42	1
trans-1,2-Dichloroethene	ND		ug/kg	1.7	0.27	1
Trichloroethene	ND		ug/kg	1.1	0.34	1
1,2-Dichlorobenzene	ND		ug/kg	5.6	0.20	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03 Date Collected: 12/11/17 09:40

Client ID: SB002 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.6	0.24	1
1,4-Dichlorobenzene	ND		ug/kg	5.6	0.20	1
Methyl tert butyl ether	ND		ug/kg	2.2	0.17	1
p/m-Xylene	ND		ug/kg	2.2	0.39	1
o-Xylene	ND		ug/kg	2.2	0.38	1
Xylenes, Total	ND		ug/kg	2.2	0.38	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.38	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	0.27	1
Dibromomethane	ND		ug/kg	11	0.27	1
Styrene	ND		ug/kg	2.2	0.45	1
Dichlorodifluoromethane	ND		ug/kg	11	0.56	1
Acetone	ND		ug/kg	11	2.6	1
Carbon disulfide	ND		ug/kg	11	1.2	1
2-Butanone	ND		ug/kg	11	0.77	1
Vinyl acetate	ND		ug/kg	11	0.17	1
4-Methyl-2-pentanone	ND		ug/kg	11	0.27	1
1,2,3-Trichloropropane	ND		ug/kg	11	0.20	1
2-Hexanone	ND		ug/kg	11	0.74	1
Bromochloromethane	ND		ug/kg	5.6	0.40	1
2,2-Dichloropropane	ND		ug/kg	5.6	0.50	1
1,2-Dibromoethane	ND		ug/kg	4.5	0.22	1
1,3-Dichloropropane	ND		ug/kg	5.6	0.20	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	0.36	1
Bromobenzene	ND		ug/kg	5.6	0.24	1
n-Butylbenzene	ND		ug/kg	1.1	0.25	1
sec-Butylbenzene	ND		ug/kg	1.1	0.24	1
tert-Butylbenzene	ND		ug/kg	5.6	0.28	1
o-Chlorotoluene	ND		ug/kg	5.6	0.25	1
p-Chlorotoluene	ND		ug/kg	5.6	0.20	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.6	0.44	1
Hexachlorobutadiene	ND		ug/kg	5.6	0.39	1
Isopropylbenzene	ND		ug/kg	1.1	0.22	1
p-Isopropyltoluene	ND		ug/kg	1.1	0.22	1
Naphthalene	ND		ug/kg	5.6	0.15	1
Acrylonitrile	ND		ug/kg	11	0.57	1
n-Propylbenzene	ND		ug/kg	1.1	0.24	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.6	0.28	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.6	0.24	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.6	0.18	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03 Date Collected: 12/11/17 09:40

Client ID: SB002 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	5.6	0.21	1
1,4-Dioxane	ND		ug/kg	45	16.	1
p-Diethylbenzene	ND		ug/kg	4.5	4.5	1
p-Ethyltoluene	ND		ug/kg	4.5	0.26	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.5	0.17	1
Ethyl ether	ND		ug/kg	5.6	0.29	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.6	0.44	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	106		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04
Client ID: SB002 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 09:50
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 16:17
Analyst: MKS
Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	1.8	1
1,1-Dichloroethane	ND		ug/kg	1.7	0.30	1
Chloroform	ND		ug/kg	1.7	0.42	1
Carbon tetrachloride	ND		ug/kg	1.1	0.39	1
1,2-Dichloropropane	ND		ug/kg	3.9	0.26	1
Dibromochloromethane	ND		ug/kg	1.1	0.20	1
1,1,2-Trichloroethane	ND		ug/kg	1.7	0.35	1
Tetrachloroethene	ND		ug/kg	1.1	0.34	1
Chlorobenzene	ND		ug/kg	1.1	0.39	1
Trichlorofluoromethane	ND		ug/kg	5.6	0.47	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.28	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	0.39	1
Bromodichloromethane	ND		ug/kg	1.1	0.34	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.23	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	0.26	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	0.23	1
1,1-Dichloropropene	ND		ug/kg	5.6	0.37	1
Bromoform	ND		ug/kg	4.5	0.26	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	0.33	1
Benzene	ND		ug/kg	1.1	0.22	1
Toluene	ND		ug/kg	1.7	0.22	1
Ethylbenzene	ND		ug/kg	1.1	0.19	1
Chloromethane	ND		ug/kg	5.6	0.49	1
Bromomethane	ND		ug/kg	2.2	0.38	1
Vinyl chloride	ND		ug/kg	2.2	0.35	1
Chloroethane	ND		ug/kg	2.2	0.35	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.42	1
trans-1,2-Dichloroethene	ND		ug/kg	1.7	0.27	1
Trichloroethene	ND		ug/kg	1.1	0.34	1
1,2-Dichlorobenzene	ND		ug/kg	5.6	0.20	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04 Date Collected: 12/11/17 09:50

Client ID: SB002 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.6	0.24	1
1,4-Dichlorobenzene	ND		ug/kg	5.6	0.20	1
Methyl tert butyl ether	ND		ug/kg	2.2	0.17	1
p/m-Xylene	ND		ug/kg	2.2	0.39	1
o-Xylene	ND		ug/kg	2.2	0.38	1
Xylenes, Total	ND		ug/kg	2.2	0.38	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.38	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	0.27	1
Dibromomethane	ND		ug/kg	11	0.27	1
Styrene	ND		ug/kg	2.2	0.45	1
Dichlorodifluoromethane	ND		ug/kg	11	0.56	1
Acetone	ND		ug/kg	11	2.6	1
Carbon disulfide	ND		ug/kg	11	1.2	1
2-Butanone	ND		ug/kg	11	0.77	1
Vinyl acetate	ND		ug/kg	11	0.17	1
4-Methyl-2-pentanone	ND		ug/kg	11	0.27	1
1,2,3-Trichloropropane	ND		ug/kg	11	0.20	1
2-Hexanone	ND		ug/kg	11	0.75	1
Bromochloromethane	ND		ug/kg	5.6	0.40	1
2,2-Dichloropropane	ND		ug/kg	5.6	0.50	1
1,2-Dibromoethane	ND		ug/kg	4.5	0.22	1
1,3-Dichloropropane	ND		ug/kg	5.6	0.20	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	0.36	1
Bromobenzene	ND		ug/kg	5.6	0.24	1
n-Butylbenzene	ND		ug/kg	1.1	0.26	1
sec-Butylbenzene	ND		ug/kg	1.1	0.24	1
tert-Butylbenzene	ND		ug/kg	5.6	0.28	1
o-Chlorotoluene	ND		ug/kg	5.6	0.25	1
p-Chlorotoluene	ND		ug/kg	5.6	0.20	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.6	0.44	1
Hexachlorobutadiene	ND		ug/kg	5.6	0.39	1
Isopropylbenzene	ND		ug/kg	1.1	0.22	1
p-Isopropyltoluene	ND		ug/kg	1.1	0.23	1
Naphthalene	ND		ug/kg	5.6	0.15	1
Acrylonitrile	ND		ug/kg	11	0.58	1
n-Propylbenzene	ND		ug/kg	1.1	0.24	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.6	0.28	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.6	0.24	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.6	0.18	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04 Date Collected: 12/11/17 09:50

Client ID: SB002 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	5.6	0.21	1
1,4-Dioxane	ND		ug/kg	45	16.	1
p-Diethylbenzene	ND		ug/kg	4.5	4.5	1
p-Ethyltoluene	ND		ug/kg	4.5	0.26	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.5	0.18	1
Ethyl ether	ND		ug/kg	5.6	0.29	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.6	0.44	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	98		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	97		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05
Client ID: SB003 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 12:15
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 16:19
Analyst: PK
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	17	2.8	1
1,1-Dichloroethane	ND		ug/kg	2.6	0.46	1
Chloroform	ND		ug/kg	2.6	0.64	1
Carbon tetrachloride	ND		ug/kg	1.7	0.59	1
1,2-Dichloropropane	ND		ug/kg	6.0	0.39	1
Dibromochloromethane	ND		ug/kg	1.7	0.30	1
1,1,2-Trichloroethane	ND		ug/kg	2.6	0.54	1
Tetrachloroethene	ND		ug/kg	1.7	0.52	1
Chlorobenzene	ND		ug/kg	1.7	0.60	1
Trichlorofluoromethane	ND		ug/kg	8.6	0.72	1
1,2-Dichloroethane	ND		ug/kg	1.7	0.42	1
1,1,1-Trichloroethane	ND		ug/kg	1.7	0.60	1
Bromodichloromethane	ND		ug/kg	1.7	0.53	1
trans-1,3-Dichloropropene	ND		ug/kg	1.7	0.36	1
cis-1,3-Dichloropropene	ND		ug/kg	1.7	0.40	1
1,3-Dichloropropene, Total	ND		ug/kg	1.7	0.36	1
1,1-Dichloropropene	ND		ug/kg	8.6	0.56	1
Bromoform	ND		ug/kg	6.9	0.41	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.7	0.51	1
Benzene	ND		ug/kg	1.7	0.33	1
Toluene	0.46	J	ug/kg	2.6	0.34	1
Ethylbenzene	ND		ug/kg	1.7	0.29	1
Chloromethane	ND		ug/kg	8.6	0.75	1
Bromomethane	ND		ug/kg	3.4	0.58	1
Vinyl chloride	ND		ug/kg	3.4	0.54	1
Chloroethane	ND		ug/kg	3.4	0.54	1
1,1-Dichloroethene	ND		ug/kg	1.7	0.64	1
trans-1,2-Dichloroethene	ND		ug/kg	2.6	0.41	1
Trichloroethene	ND		ug/kg	1.7	0.52	1
1,2-Dichlorobenzene	ND		ug/kg	8.6	0.31	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05 Date Collected: 12/11/17 12:15

Client ID: SB003 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	8.6	0.37	1
1,4-Dichlorobenzene	ND		ug/kg	8.6	0.31	1
Methyl tert butyl ether	ND		ug/kg	3.4	0.26	1
p/m-Xylene	ND		ug/kg	3.4	0.60	1
o-Xylene	ND		ug/kg	3.4	0.58	1
Xylenes, Total	ND		ug/kg	3.4	0.58	1
cis-1,2-Dichloroethene	ND		ug/kg	1.7	0.59	1
1,2-Dichloroethene, Total	ND		ug/kg	1.7	0.41	1
Dibromomethane	ND		ug/kg	17	0.41	1
Styrene	ND		ug/kg	3.4	0.69	1
Dichlorodifluoromethane	ND		ug/kg	17	0.86	1
Acetone	ND		ug/kg	17	3.9	1
Carbon disulfide	ND		ug/kg	17	1.9	1
2-Butanone	ND		ug/kg	17	1.2	1
Vinyl acetate	ND		ug/kg	17	0.26	1
4-Methyl-2-pentanone	ND		ug/kg	17	0.42	1
1,2,3-Trichloropropane	ND		ug/kg	17	0.30	1
2-Hexanone	ND		ug/kg	17	1.1	1
Bromochloromethane	ND		ug/kg	8.6	0.61	1
2,2-Dichloropropane	ND		ug/kg	8.6	0.77	1
1,2-Dibromoethane	ND		ug/kg	6.9	0.34	1
1,3-Dichloropropane	ND		ug/kg	8.6	0.31	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.7	0.55	1
Bromobenzene	ND		ug/kg	8.6	0.38	1
n-Butylbenzene	ND		ug/kg	1.7	0.39	1
sec-Butylbenzene	ND		ug/kg	1.7	0.37	1
tert-Butylbenzene	ND		ug/kg	8.6	0.42	1
o-Chlorotoluene	ND		ug/kg	8.6	0.38	1
p-Chlorotoluene	ND		ug/kg	8.6	0.31	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	8.6	0.68	1
Hexachlorobutadiene	ND		ug/kg	8.6	0.60	1
Isopropylbenzene	ND		ug/kg	1.7	0.33	1
p-Isopropyltoluene	ND		ug/kg	1.7	0.35	1
Naphthalene	0.35	J	ug/kg	8.6	0.24	1
Acrylonitrile	ND		ug/kg	17	0.88	1
n-Propylbenzene	ND		ug/kg	1.7	0.37	1
1,2,3-Trichlorobenzene	ND		ug/kg	8.6	0.43	1
1,2,4-Trichlorobenzene	ND		ug/kg	8.6	0.37	1
1,3,5-Trimethylbenzene	ND		ug/kg	8.6	0.28	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05 Date Collected: 12/11/17 12:15

Client ID: SB003 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	8.6	0.32	1
1,4-Dioxane	ND		ug/kg	69	25.	1
p-Diethylbenzene	ND		ug/kg	6.9	6.9	1
p-Ethyltoluene	ND		ug/kg	6.9	0.40	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	6.9	0.27	1
Ethyl ether	ND		ug/kg	8.6	0.45	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	8.6	0.67	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	112		70-130
Dibromofluoromethane	106		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06
Client ID: SB003 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 12:25
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 16:45
Analyst: PK
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	14	2.2	1
1,1-Dichloroethane	ND		ug/kg	2.0	0.37	1
Chloroform	ND		ug/kg	2.0	0.50	1
Carbon tetrachloride	ND		ug/kg	1.4	0.47	1
1,2-Dichloropropane	ND		ug/kg	4.8	0.31	1
Dibromochloromethane	ND		ug/kg	1.4	0.24	1
1,1,2-Trichloroethane	ND		ug/kg	2.0	0.43	1
Tetrachloroethene	ND		ug/kg	1.4	0.41	1
Chlorobenzene	ND		ug/kg	1.4	0.48	1
Trichlorofluoromethane	ND		ug/kg	6.8	0.57	1
1,2-Dichloroethane	ND		ug/kg	1.4	0.34	1
1,1,1-Trichloroethane	ND		ug/kg	1.4	0.48	1
Bromodichloromethane	ND		ug/kg	1.4	0.42	1
trans-1,3-Dichloropropene	ND		ug/kg	1.4	0.28	1
cis-1,3-Dichloropropene	ND		ug/kg	1.4	0.32	1
1,3-Dichloropropene, Total	ND		ug/kg	1.4	0.28	1
1,1-Dichloropropene	ND		ug/kg	6.8	0.45	1
Bromoform	ND		ug/kg	5.5	0.32	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.4	0.41	1
Benzene	ND		ug/kg	1.4	0.26	1
Toluene	0.28	J	ug/kg	2.0	0.27	1
Ethylbenzene	ND		ug/kg	1.4	0.23	1
Chloromethane	ND		ug/kg	6.8	0.60	1
Bromomethane	ND		ug/kg	2.7	0.46	1
Vinyl chloride	ND		ug/kg	2.7	0.43	1
Chloroethane	ND		ug/kg	2.7	0.43	1
1,1-Dichloroethene	ND		ug/kg	1.4	0.51	1
trans-1,2-Dichloroethene	ND		ug/kg	2.0	0.33	1
Trichloroethene	ND		ug/kg	1.4	0.41	1
1,2-Dichlorobenzene	ND		ug/kg	6.8	0.25	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06 Date Collected: 12/11/17 12:25

Client ID: SB003 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.8	0.30	1
1,4-Dichlorobenzene	ND		ug/kg	6.8	0.25	1
Methyl tert butyl ether	ND		ug/kg	2.7	0.21	1
p/m-Xylene	ND		ug/kg	2.7	0.48	1
o-Xylene	ND		ug/kg	2.7	0.46	1
Xylenes, Total	ND		ug/kg	2.7	0.46	1
cis-1,2-Dichloroethene	ND		ug/kg	1.4	0.47	1
1,2-Dichloroethene, Total	ND		ug/kg	1.4	0.33	1
Dibromomethane	ND		ug/kg	14	0.33	1
Styrene	ND		ug/kg	2.7	0.55	1
Dichlorodifluoromethane	ND		ug/kg	14	0.68	1
Acetone	7.5	J	ug/kg	14	3.1	1
Carbon disulfide	ND		ug/kg	14	1.5	1
2-Butanone	ND		ug/kg	14	0.94	1
Vinyl acetate	ND		ug/kg	14	0.21	1
4-Methyl-2-pentanone	ND		ug/kg	14	0.33	1
1,2,3-Trichloropropane	ND		ug/kg	14	0.24	1
2-Hexanone	ND		ug/kg	14	0.91	1
Bromochloromethane	ND		ug/kg	6.8	0.49	1
2,2-Dichloropropane	ND		ug/kg	6.8	0.61	1
1,2-Dibromoethane	ND		ug/kg	5.5	0.27	1
1,3-Dichloropropane	ND		ug/kg	6.8	0.25	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.4	0.43	1
Bromobenzene	ND		ug/kg	6.8	0.30	1
n-Butylbenzene	ND		ug/kg	1.4	0.31	1
sec-Butylbenzene	ND		ug/kg	1.4	0.30	1
tert-Butylbenzene	ND		ug/kg	6.8	0.34	1
o-Chlorotoluene	ND		ug/kg	6.8	0.30	1
p-Chlorotoluene	ND		ug/kg	6.8	0.25	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.8	0.54	1
Hexachlorobutadiene	ND		ug/kg	6.8	0.48	1
Isopropylbenzene	ND		ug/kg	1.4	0.26	1
p-Isopropyltoluene	ND		ug/kg	1.4	0.28	1
Naphthalene	0.37	J	ug/kg	6.8	0.19	1
Acrylonitrile	ND		ug/kg	14	0.70	1
n-Propylbenzene	ND		ug/kg	1.4	0.29	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.8	0.34	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.8	0.29	1
1,3,5-Trimethylbenzene	ND		ug/kg	6.8	0.22	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06 Date Collected: 12/11/17 12:25

Client ID: SB003 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.32	J	ug/kg	6.8	0.25	1
1,4-Dioxane	ND		ug/kg	55	20.	1
p-Diethylbenzene	ND		ug/kg	5.5	5.5	1
p-Ethyltoluene	ND		ug/kg	5.5	0.32	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	5.5	0.21	1
Ethyl ether	ND		ug/kg	6.8	0.35	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.8	0.54	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	113		70-130
Dibromofluoromethane	107		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07
Client ID: SB004 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 12:40
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 17:11
Analyst: PK
Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	12	2.0	1
1,1-Dichloroethane	ND		ug/kg	1.8	0.32	1
Chloroform	ND		ug/kg	1.8	0.44	1
Carbon tetrachloride	ND		ug/kg	1.2	0.42	1
1,2-Dichloropropane	ND		ug/kg	4.2	0.27	1
Dibromochloromethane	ND		ug/kg	1.2	0.21	1
1,1,2-Trichloroethane	ND		ug/kg	1.8	0.38	1
Tetrachloroethene	ND		ug/kg	1.2	0.36	1
Chlorobenzene	ND		ug/kg	1.2	0.42	1
Trichlorofluoromethane	ND		ug/kg	6.0	0.50	1
1,2-Dichloroethane	ND		ug/kg	1.2	0.30	1
1,1,1-Trichloroethane	ND		ug/kg	1.2	0.42	1
Bromodichloromethane	ND		ug/kg	1.2	0.37	1
trans-1,3-Dichloropropene	ND		ug/kg	1.2	0.25	1
cis-1,3-Dichloropropene	ND		ug/kg	1.2	0.28	1
1,3-Dichloropropene, Total	ND		ug/kg	1.2	0.25	1
1,1-Dichloropropene	ND		ug/kg	6.0	0.40	1
Bromoform	ND		ug/kg	4.8	0.28	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.2	0.36	1
Benzene	ND		ug/kg	1.2	0.23	1
Toluene	ND		ug/kg	1.8	0.23	1
Ethylbenzene	ND		ug/kg	1.2	0.20	1
Chloromethane	ND		ug/kg	6.0	0.52	1
Bromomethane	ND		ug/kg	2.4	0.41	1
Vinyl chloride	ND		ug/kg	2.4	0.38	1
Chloroethane	ND		ug/kg	2.4	0.38	1
1,1-Dichloroethene	ND		ug/kg	1.2	0.45	1
trans-1,2-Dichloroethene	ND		ug/kg	1.8	0.29	1
Trichloroethene	ND		ug/kg	1.2	0.36	1
1,2-Dichlorobenzene	ND		ug/kg	6.0	0.22	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07 Date Collected: 12/11/17 12:40

Client ID: SB004 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.0	0.26	1
1,4-Dichlorobenzene	ND		ug/kg	6.0	0.22	1
Methyl tert butyl ether	ND		ug/kg	2.4	0.18	1
p/m-Xylene	ND		ug/kg	2.4	0.42	1
o-Xylene	ND		ug/kg	2.4	0.41	1
Xylenes, Total	ND		ug/kg	2.4	0.41	1
cis-1,2-Dichloroethene	ND		ug/kg	1.2	0.41	1
1,2-Dichloroethene, Total	ND		ug/kg	1.2	0.29	1
Dibromomethane	ND		ug/kg	12	0.29	1
Styrene	ND		ug/kg	2.4	0.48	1
Dichlorodifluoromethane	ND		ug/kg	12	0.60	1
Acetone	58		ug/kg	12	2.8	1
Carbon disulfide	ND		ug/kg	12	1.3	1
2-Butanone	ND		ug/kg	12	0.83	1
Vinyl acetate	ND		ug/kg	12	0.18	1
4-Methyl-2-pentanone	ND		ug/kg	12	0.29	1
1,2,3-Trichloropropane	ND		ug/kg	12	0.21	1
2-Hexanone	ND		ug/kg	12	0.80	1
Bromochloromethane	ND		ug/kg	6.0	0.43	1
2,2-Dichloropropane	ND		ug/kg	6.0	0.54	1
1,2-Dibromoethane	ND		ug/kg	4.8	0.24	1
1,3-Dichloropropane	ND		ug/kg	6.0	0.22	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.2	0.38	1
Bromobenzene	ND		ug/kg	6.0	0.26	1
n-Butylbenzene	ND		ug/kg	1.2	0.27	1
sec-Butylbenzene	ND		ug/kg	1.2	0.26	1
tert-Butylbenzene	ND		ug/kg	6.0	0.30	1
o-Chlorotoluene	ND		ug/kg	6.0	0.27	1
p-Chlorotoluene	ND		ug/kg	6.0	0.22	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.0	0.48	1
Hexachlorobutadiene	ND		ug/kg	6.0	0.42	1
Isopropylbenzene	ND		ug/kg	1.2	0.23	1
p-Isopropyltoluene	ND		ug/kg	1.2	0.24	1
Naphthalene	0.18	J	ug/kg	6.0	0.17	1
Acrylonitrile	ND		ug/kg	12	0.62	1
n-Propylbenzene	ND		ug/kg	1.2	0.26	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.0	0.30	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.0	0.26	1
1,3,5-Trimethylbenzene	ND		ug/kg	6.0	0.19	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07 Date Collected: 12/11/17 12:40

Client ID: SB004 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	6.0	0.22	1
1,4-Dioxane	ND		ug/kg	48	17.	1
p-Diethylbenzene	ND		ug/kg	4.8	4.8	1
p-Ethyltoluene	ND		ug/kg	4.8	0.28	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.8	0.19	1
Ethyl ether	ND		ug/kg	6.0	0.31	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.0	0.47	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	109		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	106		70-130
Dibromofluoromethane	103		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08
Client ID: SB004 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 12:50
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 15:25
Analyst: MKS
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	15	2.4	1
1,1-Dichloroethane	ND		ug/kg	2.2	0.40	1
Chloroform	ND		ug/kg	2.2	0.55	1
Carbon tetrachloride	ND		ug/kg	1.5	0.51	1
1,2-Dichloropropane	ND		ug/kg	5.2	0.34	1
Dibromochloromethane	ND		ug/kg	1.5	0.26	1
1,1,2-Trichloroethane	ND		ug/kg	2.2	0.46	1
Tetrachloroethene	ND		ug/kg	1.5	0.45	1
Chlorobenzene	ND		ug/kg	1.5	0.52	1
Trichlorofluoromethane	ND		ug/kg	7.4	0.62	1
1,2-Dichloroethane	ND		ug/kg	1.5	0.36	1
1,1,1-Trichloroethane	ND		ug/kg	1.5	0.52	1
Bromodichloromethane	ND		ug/kg	1.5	0.46	1
trans-1,3-Dichloropropene	ND		ug/kg	1.5	0.31	1
cis-1,3-Dichloropropene	ND		ug/kg	1.5	0.34	1
1,3-Dichloropropene, Total	ND		ug/kg	1.5	0.31	1
1,1-Dichloropropene	ND		ug/kg	7.4	0.49	1
Bromoform	ND		ug/kg	5.9	0.35	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.5	0.44	1
Benzene	ND		ug/kg	1.5	0.29	1
Toluene	0.93	J	ug/kg	2.2	0.29	1
Ethylbenzene	0.27	J	ug/kg	1.5	0.25	1
Chloromethane	ND		ug/kg	7.4	0.65	1
Bromomethane	ND		ug/kg	3.0	0.50	1
Vinyl chloride	ND		ug/kg	3.0	0.47	1
Chloroethane	ND		ug/kg	3.0	0.47	1
1,1-Dichloroethene	ND		ug/kg	1.5	0.55	1
trans-1,2-Dichloroethene	ND		ug/kg	2.2	0.36	1
Trichloroethene	ND		ug/kg	1.5	0.45	1
1,2-Dichlorobenzene	ND		ug/kg	7.4	0.27	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08 Date Collected: 12/11/17 12:50

Client ID: SB004 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	7.4	0.32	1
1,4-Dichlorobenzene	ND		ug/kg	7.4	0.27	1
Methyl tert butyl ether	ND		ug/kg	3.0	0.23	1
p/m-Xylene	0.72	J	ug/kg	3.0	0.52	1
o-Xylene	ND		ug/kg	3.0	0.50	1
Xylenes, Total	0.72	J	ug/kg	3.0	0.50	1
cis-1,2-Dichloroethene	ND		ug/kg	1.5	0.51	1
1,2-Dichloroethene, Total	ND		ug/kg	1.5	0.36	1
Dibromomethane	ND		ug/kg	15	0.36	1
Styrene	ND		ug/kg	3.0	0.60	1
Dichlorodifluoromethane	ND		ug/kg	15	0.74	1
Acetone	6.7	J	ug/kg	15	3.4	1
Carbon disulfide	ND		ug/kg	15	1.6	1
2-Butanone	ND		ug/kg	15	1.0	1
Vinyl acetate	ND		ug/kg	15	0.23	1
4-Methyl-2-pentanone	ND		ug/kg	15	0.36	1
1,2,3-Trichloropropane	ND		ug/kg	15	0.26	1
2-Hexanone	ND		ug/kg	15	0.99	1
Bromochloromethane	ND		ug/kg	7.4	0.53	1
2,2-Dichloropropane	ND		ug/kg	7.4	0.67	1
1,2-Dibromoethane	ND		ug/kg	5.9	0.30	1
1,3-Dichloropropane	ND		ug/kg	7.4	0.27	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.5	0.47	1
Bromobenzene	ND		ug/kg	7.4	0.32	1
n-Butylbenzene	ND		ug/kg	1.5	0.34	1
sec-Butylbenzene	ND		ug/kg	1.5	0.32	1
tert-Butylbenzene	ND		ug/kg	7.4	0.37	1
o-Chlorotoluene	ND		ug/kg	7.4	0.33	1
p-Chlorotoluene	ND		ug/kg	7.4	0.27	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	7.4	0.59	1
Hexachlorobutadiene	ND		ug/kg	7.4	0.52	1
Isopropylbenzene	ND		ug/kg	1.5	0.29	1
p-Isopropyltoluene	ND		ug/kg	1.5	0.30	1
Naphthalene	0.55	J	ug/kg	7.4	0.20	1
Acrylonitrile	ND		ug/kg	15	0.76	1
n-Propylbenzene	ND		ug/kg	1.5	0.32	1
1,2,3-Trichlorobenzene	ND		ug/kg	7.4	0.37	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.4	0.32	1
1,3,5-Trimethylbenzene	ND		ug/kg	7.4	0.24	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08 Date Collected: 12/11/17 12:50

Client ID: SB004 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.39	J	ug/kg	7.4	0.28	1
1,4-Dioxane	ND		ug/kg	59	21.	1
p-Diethylbenzene	ND		ug/kg	5.9	5.9	1
p-Ethyltoluene	ND		ug/kg	5.9	0.35	1
1,2,4,5-Tetramethylbenzene	0.44	J	ug/kg	5.9	0.23	1
Ethyl ether	ND		ug/kg	7.4	0.39	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	7.4	0.58	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	93		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	96		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09
Client ID: FIELD BLANK 001
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 10:30
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 12/20/17 15:43
Analyst: BD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	2.5	0.70	1
1,1-Dichloroethane	ND		ug/l	2.5	0.70	1
Chloroform	ND		ug/l	2.5	0.70	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,1,2-Trichloroethane	ND		ug/l	1.5	0.50	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
Chlorobenzene	ND		ug/l	2.5	0.70	1
Trichlorofluoromethane	ND		ug/l	2.5	0.70	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	2.5	0.70	1
Bromodichloromethane	ND		ug/l	0.50	0.19	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1-Dichloropropene	ND		ug/l	2.5	0.70	1
Bromoform	ND		ug/l	2.0	0.65	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.17	1
Benzene	ND		ug/l	0.50	0.16	1
Toluene	ND		ug/l	2.5	0.70	1
Ethylbenzene	ND		ug/l	2.5	0.70	1
Chloromethane	ND		ug/l	2.5	0.70	1
Bromomethane	ND		ug/l	2.5	0.70	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Chloroethane	ND		ug/l	2.5	0.70	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
trans-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09 Date Collected: 12/11/17 10:30

Client ID: FIELD BLANK 001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/l	2.5	0.70	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.70	1
Methyl tert butyl ether	ND		ug/l	2.5	0.70	1
p/m-Xylene	ND		ug/l	2.5	0.70	1
o-Xylene	ND		ug/l	2.5	0.70	1
Xylenes, Total	ND		ug/l	2.5	0.70	1
cis-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
1,2-Dichloroethene, Total	ND		ug/l	2.5	0.70	1
Dibromomethane	ND		ug/l	5.0	1.0	1
1,2,3-Trichloropropane	ND		ug/l	2.5	0.70	1
Acrylonitrile	ND		ug/l	5.0	1.5	1
Styrene	ND		ug/l	2.5	0.70	1
Dichlorodifluoromethane	ND		ug/l	5.0	1.0	1
Acetone	ND		ug/l	5.0	1.5	1
Carbon disulfide	ND		ug/l	5.0	1.0	1
2-Butanone	ND		ug/l	5.0	1.9	1
Vinyl acetate	ND		ug/l	5.0	1.0	1
4-Methyl-2-pentanone	ND		ug/l	5.0	1.0	1
2-Hexanone	ND		ug/l	5.0	1.0	1
Bromochloromethane	ND		ug/l	2.5	0.70	1
2,2-Dichloropropane	ND		ug/l	2.5	0.70	1
1,2-Dibromoethane	ND		ug/l	2.0	0.65	1
1,3-Dichloropropane	ND		ug/l	2.5	0.70	1
1,1,1,2-Tetrachloroethane	ND		ug/l	2.5	0.70	1
Bromobenzene	ND		ug/l	2.5	0.70	1
n-Butylbenzene	ND		ug/l	2.5	0.70	1
sec-Butylbenzene	ND		ug/l	2.5	0.70	1
tert-Butylbenzene	ND		ug/l	2.5	0.70	1
o-Chlorotoluene	ND		ug/l	2.5	0.70	1
p-Chlorotoluene	ND		ug/l	2.5	0.70	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.70	1
Hexachlorobutadiene	ND		ug/l	2.5	0.70	1
Isopropylbenzene	ND		ug/l	2.5	0.70	1
p-Isopropyltoluene	ND		ug/l	2.5	0.70	1
Naphthalene	ND		ug/l	2.5	0.70	1
n-Propylbenzene	ND		ug/l	2.5	0.70	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09 Date Collected: 12/11/17 10:30

Client ID: FIELD BLANK 001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/l	2.5	0.70	1
1,4-Dioxane	ND		ug/l	250	61.	1
p-Diethylbenzene	ND		ug/l	2.0	0.70	1
p-Ethyltoluene	ND		ug/l	2.0	0.70	1
1,2,4,5-Tetramethylbenzene	ND		ug/l	2.0	0.54	1
Ethyl ether	ND		ug/l	2.5	0.70	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	0.70	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	92		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	104		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10
Client ID: DUP001
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 00:00
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/20/17 15:51
Analyst: MKS
Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	10	1.7	1
1,1-Dichloroethane	ND		ug/kg	1.6	0.28	1
Chloroform	ND		ug/kg	1.6	0.39	1
Carbon tetrachloride	ND		ug/kg	1.0	0.36	1
1,2-Dichloropropane	ND		ug/kg	3.7	0.24	1
Dibromochloromethane	ND		ug/kg	1.0	0.18	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	0.33	1
Tetrachloroethene	ND		ug/kg	1.0	0.32	1
Chlorobenzene	ND		ug/kg	1.0	0.36	1
Trichlorofluoromethane	ND		ug/kg	5.2	0.44	1
1,2-Dichloroethane	ND		ug/kg	1.0	0.26	1
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.37	1
Bromodichloromethane	ND		ug/kg	1.0	0.32	1
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.22	1
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.24	1
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.22	1
1,1-Dichloropropene	ND		ug/kg	5.2	0.34	1
Bromoform	ND		ug/kg	4.2	0.25	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.31	1
Benzene	ND		ug/kg	1.0	0.20	1
Toluene	ND		ug/kg	1.6	0.20	1
Ethylbenzene	ND		ug/kg	1.0	0.18	1
Chloromethane	ND		ug/kg	5.2	0.46	1
Bromomethane	ND		ug/kg	2.1	0.35	1
Vinyl chloride	ND		ug/kg	2.1	0.33	1
Chloroethane	ND		ug/kg	2.1	0.33	1
1,1-Dichloroethene	ND		ug/kg	1.0	0.39	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	0.25	1
Trichloroethene	ND		ug/kg	1.0	0.32	1
1,2-Dichlorobenzene	ND		ug/kg	5.2	0.19	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10 Date Collected: 12/11/17 00:00

Client ID: DUP001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.2	0.23	1
1,4-Dichlorobenzene	ND		ug/kg	5.2	0.19	1
Methyl tert butyl ether	ND		ug/kg	2.1	0.16	1
p/m-Xylene	ND		ug/kg	2.1	0.37	1
o-Xylene	ND		ug/kg	2.1	0.35	1
Xylenes, Total	ND		ug/kg	2.1	0.35	1
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.36	1
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.25	1
Dibromomethane	ND		ug/kg	10	0.25	1
Styrene	ND		ug/kg	2.1	0.42	1
Dichlorodifluoromethane	ND		ug/kg	10	0.52	1
Acetone	6.4	J	ug/kg	10	2.4	1
Carbon disulfide	ND		ug/kg	10	1.2	1
2-Butanone	ND		ug/kg	10	0.72	1
Vinyl acetate	ND		ug/kg	10	0.16	1
4-Methyl-2-pentanone	ND		ug/kg	10	0.26	1
1,2,3-Trichloropropane	ND		ug/kg	10	0.18	1
2-Hexanone	ND		ug/kg	10	0.70	1
Bromochloromethane	ND		ug/kg	5.2	0.37	1
2,2-Dichloropropane	ND		ug/kg	5.2	0.47	1
1,2-Dibromoethane	ND		ug/kg	4.2	0.21	1
1,3-Dichloropropane	ND		ug/kg	5.2	0.19	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.33	1
Bromobenzene	ND		ug/kg	5.2	0.23	1
n-Butylbenzene	ND		ug/kg	1.0	0.24	1
sec-Butylbenzene	ND		ug/kg	1.0	0.23	1
tert-Butylbenzene	ND		ug/kg	5.2	0.26	1
o-Chlorotoluene	ND		ug/kg	5.2	0.23	1
p-Chlorotoluene	ND		ug/kg	5.2	0.19	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.2	0.41	1
Hexachlorobutadiene	ND		ug/kg	5.2	0.36	1
Isopropylbenzene	ND		ug/kg	1.0	0.20	1
p-Isopropyltoluene	ND		ug/kg	1.0	0.21	1
Naphthalene	ND		ug/kg	5.2	0.14	1
Acrylonitrile	ND		ug/kg	10	0.54	1
n-Propylbenzene	ND		ug/kg	1.0	0.22	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.2	0.26	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.2	0.22	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.2	0.17	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10 Date Collected: 12/11/17 00:00

Client ID: DUP001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	5.2	0.19	1
1,4-Dioxane	ND		ug/kg	42	15.	1
p-Diethylbenzene	ND		ug/kg	4.2	4.2	1
p-Ethyltoluene	ND		ug/kg	4.2	0.24	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.2	0.16	1
Ethyl ether	ND		ug/kg	5.2	0.27	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.2	0.41	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	95		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-11
Client ID: TRIP BLANK
Sample Location: 718 E. 212TH ST., BRONX, NY

Date Collected: 12/11/17 00:00
Date Received: 12/12/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 12/20/17 16:12
Analyst: BD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	2.5	0.70	1
1,1-Dichloroethane	ND		ug/l	2.5	0.70	1
Chloroform	ND		ug/l	2.5	0.70	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,1,2-Trichloroethane	ND		ug/l	1.5	0.50	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
Chlorobenzene	ND		ug/l	2.5	0.70	1
Trichlorofluoromethane	ND		ug/l	2.5	0.70	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	2.5	0.70	1
Bromodichloromethane	ND		ug/l	0.50	0.19	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1-Dichloropropene	ND		ug/l	2.5	0.70	1
Bromoform	ND		ug/l	2.0	0.65	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.17	1
Benzene	ND		ug/l	0.50	0.16	1
Toluene	ND		ug/l	2.5	0.70	1
Ethylbenzene	ND		ug/l	2.5	0.70	1
Chloromethane	ND		ug/l	2.5	0.70	1
Bromomethane	ND		ug/l	2.5	0.70	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Chloroethane	ND		ug/l	2.5	0.70	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
trans-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-11 Date Collected: 12/11/17 00:00

Client ID: TRIP BLANK Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/l	2.5	0.70	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.70	1
Methyl tert butyl ether	ND		ug/l	2.5	0.70	1
p/m-Xylene	ND		ug/l	2.5	0.70	1
o-Xylene	ND		ug/l	2.5	0.70	1
Xylenes, Total	ND		ug/l	2.5	0.70	1
cis-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
1,2-Dichloroethene, Total	ND		ug/l	2.5	0.70	1
Dibromomethane	ND		ug/l	5.0	1.0	1
1,2,3-Trichloropropane	ND		ug/l	2.5	0.70	1
Acrylonitrile	ND		ug/l	5.0	1.5	1
Styrene	ND		ug/l	2.5	0.70	1
Dichlorodifluoromethane	ND		ug/l	5.0	1.0	1
Acetone	ND		ug/l	5.0	1.5	1
Carbon disulfide	ND		ug/l	5.0	1.0	1
2-Butanone	ND		ug/l	5.0	1.9	1
Vinyl acetate	ND		ug/l	5.0	1.0	1
4-Methyl-2-pentanone	ND		ug/l	5.0	1.0	1
2-Hexanone	ND		ug/l	5.0	1.0	1
Bromochloromethane	ND		ug/l	2.5	0.70	1
2,2-Dichloropropane	ND		ug/l	2.5	0.70	1
1,2-Dibromoethane	ND		ug/l	2.0	0.65	1
1,3-Dichloropropane	ND		ug/l	2.5	0.70	1
1,1,1,2-Tetrachloroethane	ND		ug/l	2.5	0.70	1
Bromobenzene	ND		ug/l	2.5	0.70	1
n-Butylbenzene	ND		ug/l	2.5	0.70	1
sec-Butylbenzene	ND		ug/l	2.5	0.70	1
tert-Butylbenzene	ND		ug/l	2.5	0.70	1
o-Chlorotoluene	ND		ug/l	2.5	0.70	1
p-Chlorotoluene	ND		ug/l	2.5	0.70	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.70	1
Hexachlorobutadiene	ND		ug/l	2.5	0.70	1
Isopropylbenzene	ND		ug/l	2.5	0.70	1
p-Isopropyltoluene	ND		ug/l	2.5	0.70	1
Naphthalene	ND		ug/l	2.5	0.70	1
n-Propylbenzene	ND		ug/l	2.5	0.70	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-11 Date Collected: 12/11/17 00:00

Client ID: TRIP BLANK Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/l	2.5	0.70	1
1,4-Dioxane	ND		ug/l	250	61.	1
p-Diethylbenzene	ND		ug/l	2.0	0.70	1
p-Ethyltoluene	ND		ug/l	2.0	0.70	1
1,2,4,5-Tetramethylbenzene	ND		ug/l	2.0	0.54	1
Ethyl ether	ND		ug/l	2.5	0.70	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	0.70	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	112		70-130
Toluene-d8	91		70-130
4-Bromofluorobenzene	89		70-130
Dibromofluoromethane	104		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 08:26
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03,05-07 Batch: WG1074862-5					
Methylene chloride	ND		ug/kg	10	1.6
1,1-Dichloroethane	ND		ug/kg	1.5	0.27
Chloroform	ND		ug/kg	1.5	0.37
Carbon tetrachloride	ND		ug/kg	1.0	0.34
1,2-Dichloropropane	ND		ug/kg	3.5	0.23
Dibromochloromethane	ND		ug/kg	1.0	0.18
1,1,2-Trichloroethane	ND		ug/kg	1.5	0.31
Tetrachloroethene	ND		ug/kg	1.0	0.30
Chlorobenzene	ND		ug/kg	1.0	0.35
Trichlorofluoromethane	ND		ug/kg	5.0	0.42
1,2-Dichloroethane	ND		ug/kg	1.0	0.25
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.35
Bromodichloromethane	ND		ug/kg	1.0	0.31
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.21
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.23
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.21
1,1-Dichloropropene	ND		ug/kg	5.0	0.33
Bromoform	ND		ug/kg	4.0	0.24
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.30
Benzene	ND		ug/kg	1.0	0.19
Toluene	ND		ug/kg	1.5	0.20
Ethylbenzene	ND		ug/kg	1.0	0.17
Chloromethane	ND		ug/kg	5.0	0.44
Bromomethane	0.38	J	ug/kg	2.0	0.34
Vinyl chloride	ND		ug/kg	2.0	0.32
Chloroethane	ND		ug/kg	2.0	0.32
1,1-Dichloroethene	ND		ug/kg	1.0	0.37
trans-1,2-Dichloroethene	ND		ug/kg	1.5	0.24
Trichloroethene	ND		ug/kg	1.0	0.30

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 08:26
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03,05-07 Batch: WG1074862-5					
1,2-Dichlorobenzene	ND		ug/kg	5.0	0.18
1,3-Dichlorobenzene	ND		ug/kg	5.0	0.22
1,4-Dichlorobenzene	ND		ug/kg	5.0	0.18
Methyl tert butyl ether	ND		ug/kg	2.0	0.15
p/m-Xylene	ND		ug/kg	2.0	0.35
o-Xylene	ND		ug/kg	2.0	0.34
Xylenes, Total	ND		ug/kg	2.0	0.34
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.34
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.24
Dibromomethane	ND		ug/kg	10	0.24
Styrene	ND		ug/kg	2.0	0.40
Dichlorodifluoromethane	ND		ug/kg	10	0.50
Acetone	ND		ug/kg	10	2.3
Carbon disulfide	ND		ug/kg	10	1.1
2-Butanone	ND		ug/kg	10	0.69
Vinyl acetate	ND		ug/kg	10	0.15
4-Methyl-2-pentanone	ND		ug/kg	10	0.24
1,2,3-Trichloropropane	ND		ug/kg	10	0.18
2-Hexanone	ND		ug/kg	10	0.67
Bromochloromethane	ND		ug/kg	5.0	0.36
2,2-Dichloropropane	ND		ug/kg	5.0	0.45
1,2-Dibromoethane	ND		ug/kg	4.0	0.20
1,3-Dichloropropane	ND		ug/kg	5.0	0.18
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.32
Bromobenzene	ND		ug/kg	5.0	0.22
n-Butylbenzene	ND		ug/kg	1.0	0.23
sec-Butylbenzene	ND		ug/kg	1.0	0.22
tert-Butylbenzene	ND		ug/kg	5.0	0.25
o-Chlorotoluene	ND		ug/kg	5.0	0.22

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 08:26
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03,05-07 Batch: WG1074862-5					
p-Chlorotoluene	ND		ug/kg	5.0	0.18
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.0	0.40
Hexachlorobutadiene	ND		ug/kg	5.0	0.35
Isopropylbenzene	ND		ug/kg	1.0	0.19
p-Isopropyltoluene	ND		ug/kg	1.0	0.20
Naphthalene	ND		ug/kg	5.0	0.14
Acrylonitrile	ND		ug/kg	10	0.51
n-Propylbenzene	ND		ug/kg	1.0	0.22
1,2,3-Trichlorobenzene	ND		ug/kg	5.0	0.25
1,2,4-Trichlorobenzene	ND		ug/kg	5.0	0.22
1,3,5-Trimethylbenzene	ND		ug/kg	5.0	0.16
1,2,4-Trimethylbenzene	ND		ug/kg	5.0	0.19
1,4-Dioxane	ND		ug/kg	40	14.
p-Diethylbenzene	ND		ug/kg	4.0	4.0
p-Ethyltoluene	ND		ug/kg	4.0	0.23
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.0	0.16
Ethyl ether	ND		ug/kg	5.0	0.26
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.0	0.39

Tentatively Identified Compounds			
Total TIC Compounds	2.18	J	ug/kg
Cyclotrisiloxane, Hexamethyl-	2.18	NJ	ug/kg

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 08:26
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-03,05-07 Batch: WG1074862-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	102		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 09:06
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 09,11 Batch: WG1074916-5					
Methylene chloride	ND		ug/l	2.5	0.70
1,1-Dichloroethane	ND		ug/l	2.5	0.70
Chloroform	ND		ug/l	2.5	0.70
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,1,2-Trichloroethane	ND		ug/l	1.5	0.50
Tetrachloroethene	ND		ug/l	0.50	0.18
Chlorobenzene	ND		ug/l	2.5	0.70
Trichlorofluoromethane	ND		ug/l	2.5	0.70
1,2-Dichloroethane	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	2.5	0.70
Bromodichloromethane	ND		ug/l	0.50	0.19
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1-Dichloropropene	ND		ug/l	2.5	0.70
Bromoform	ND		ug/l	2.0	0.65
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.17
Benzene	ND		ug/l	0.50	0.16
Toluene	ND		ug/l	2.5	0.70
Ethylbenzene	ND		ug/l	2.5	0.70
Chloromethane	ND		ug/l	2.5	0.70
Bromomethane	ND		ug/l	2.5	0.70
Vinyl chloride	ND		ug/l	1.0	0.07
Chloroethane	ND		ug/l	2.5	0.70
1,1-Dichloroethene	ND		ug/l	0.50	0.17
trans-1,2-Dichloroethene	ND		ug/l	2.5	0.70
Trichloroethene	ND		ug/l	0.50	0.18

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 09:06
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 09,11 Batch: WG1074916-5					
1,2-Dichlorobenzene	ND		ug/l	2.5	0.70
1,3-Dichlorobenzene	ND		ug/l	2.5	0.70
1,4-Dichlorobenzene	ND		ug/l	2.5	0.70
Methyl tert butyl ether	ND		ug/l	2.5	0.70
p/m-Xylene	ND		ug/l	2.5	0.70
o-Xylene	ND		ug/l	2.5	0.70
Xylenes, Total	ND		ug/l	2.5	0.70
cis-1,2-Dichloroethene	ND		ug/l	2.5	0.70
1,2-Dichloroethene, Total	ND		ug/l	2.5	0.70
Dibromomethane	ND		ug/l	5.0	1.0
1,2,3-Trichloropropane	ND		ug/l	2.5	0.70
Acrylonitrile	ND		ug/l	5.0	1.5
Styrene	ND		ug/l	2.5	0.70
Dichlorodifluoromethane	ND		ug/l	5.0	1.0
Acetone	ND		ug/l	5.0	1.5
Carbon disulfide	ND		ug/l	5.0	1.0
2-Butanone	ND		ug/l	5.0	1.9
Vinyl acetate	ND		ug/l	5.0	1.0
4-Methyl-2-pentanone	ND		ug/l	5.0	1.0
2-Hexanone	ND		ug/l	5.0	1.0
Bromochloromethane	ND		ug/l	2.5	0.70
2,2-Dichloropropane	ND		ug/l	2.5	0.70
1,2-Dibromoethane	ND		ug/l	2.0	0.65
1,3-Dichloropropane	ND		ug/l	2.5	0.70
1,1,1,2-Tetrachloroethane	ND		ug/l	2.5	0.70
Bromobenzene	ND		ug/l	2.5	0.70
n-Butylbenzene	ND		ug/l	2.5	0.70
sec-Butylbenzene	ND		ug/l	2.5	0.70
tert-Butylbenzene	ND		ug/l	2.5	0.70

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 09:06
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 09,11 Batch: WG1074916-5					
o-Chlorotoluene	ND		ug/l	2.5	0.70
p-Chlorotoluene	ND		ug/l	2.5	0.70
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.70
Hexachlorobutadiene	0.82	J	ug/l	2.5	0.70
Isopropylbenzene	ND		ug/l	2.5	0.70
p-Isopropyltoluene	ND		ug/l	2.5	0.70
Naphthalene	ND		ug/l	2.5	0.70
n-Propylbenzene	ND		ug/l	2.5	0.70
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.70
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.70
1,3,5-Trimethylbenzene	ND		ug/l	2.5	0.70
1,2,4-Trimethylbenzene	ND		ug/l	2.5	0.70
1,4-Dioxane	ND		ug/l	250	61.
p-Diethylbenzene	ND		ug/l	2.0	0.70
p-Ethyltoluene	ND		ug/l	2.0	0.70
1,2,4,5-Tetramethylbenzene	ND		ug/l	2.0	0.54
Ethyl ether	ND		ug/l	2.5	0.70
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	0.70

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	109		70-130
Toluene-d8	93		70-130
4-Bromofluorobenzene	88		70-130
Dibromofluoromethane	103		70-130

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 08:31
Analyst: JC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 04,08,10 Batch: WG1075119-5					
Methylene chloride	ND		ug/kg	10	1.6
1,1-Dichloroethane	ND		ug/kg	1.5	0.27
Chloroform	ND		ug/kg	1.5	0.37
Carbon tetrachloride	ND		ug/kg	1.0	0.34
1,2-Dichloropropane	ND		ug/kg	3.5	0.23
Dibromochloromethane	ND		ug/kg	1.0	0.18
1,1,2-Trichloroethane	ND		ug/kg	1.5	0.31
Tetrachloroethene	ND		ug/kg	1.0	0.30
Chlorobenzene	ND		ug/kg	1.0	0.35
Trichlorofluoromethane	ND		ug/kg	5.0	0.42
1,2-Dichloroethane	ND		ug/kg	1.0	0.25
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.35
Bromodichloromethane	ND		ug/kg	1.0	0.31
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.21
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.23
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.21
1,1-Dichloropropene	ND		ug/kg	5.0	0.33
Bromoform	ND		ug/kg	4.0	0.24
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.30
Benzene	ND		ug/kg	1.0	0.19
Toluene	ND		ug/kg	1.5	0.20
Ethylbenzene	ND		ug/kg	1.0	0.17
Chloromethane	ND		ug/kg	5.0	0.44
Bromomethane	2.7		ug/kg	2.0	0.34
Vinyl chloride	ND		ug/kg	2.0	0.32
Chloroethane	ND		ug/kg	2.0	0.32
1,1-Dichloroethene	ND		ug/kg	1.0	0.37
trans-1,2-Dichloroethene	ND		ug/kg	1.5	0.24
Trichloroethene	ND		ug/kg	1.0	0.30

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 08:31
Analyst: JC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 04,08,10 Batch: WG1075119-5					
1,2-Dichlorobenzene	ND		ug/kg	5.0	0.18
1,3-Dichlorobenzene	ND		ug/kg	5.0	0.22
1,4-Dichlorobenzene	ND		ug/kg	5.0	0.18
Methyl tert butyl ether	ND		ug/kg	2.0	0.15
p/m-Xylene	ND		ug/kg	2.0	0.35
o-Xylene	ND		ug/kg	2.0	0.34
Xylenes, Total	ND		ug/kg	2.0	0.34
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.34
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.24
Dibromomethane	ND		ug/kg	10	0.24
Styrene	ND		ug/kg	2.0	0.40
Dichlorodifluoromethane	ND		ug/kg	10	0.50
Acetone	ND		ug/kg	10	2.3
Carbon disulfide	ND		ug/kg	10	1.1
2-Butanone	ND		ug/kg	10	0.69
Vinyl acetate	ND		ug/kg	10	0.15
4-Methyl-2-pentanone	ND		ug/kg	10	0.24
1,2,3-Trichloropropane	ND		ug/kg	10	0.18
2-Hexanone	ND		ug/kg	10	0.67
Bromochloromethane	ND		ug/kg	5.0	0.36
2,2-Dichloropropane	ND		ug/kg	5.0	0.45
1,2-Dibromoethane	ND		ug/kg	4.0	0.20
1,3-Dichloropropane	ND		ug/kg	5.0	0.18
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.32
Bromobenzene	ND		ug/kg	5.0	0.22
n-Butylbenzene	ND		ug/kg	1.0	0.23
sec-Butylbenzene	ND		ug/kg	1.0	0.22
tert-Butylbenzene	ND		ug/kg	5.0	0.25
o-Chlorotoluene	ND		ug/kg	5.0	0.22

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/20/17 08:31
Analyst: JC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 04,08,10 Batch: WG1075119-5					
p-Chlorotoluene	ND		ug/kg	5.0	0.18
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.0	0.40
Hexachlorobutadiene	ND		ug/kg	5.0	0.35
Isopropylbenzene	ND		ug/kg	1.0	0.19
p-Isopropyltoluene	ND		ug/kg	1.0	0.20
Naphthalene	ND		ug/kg	5.0	0.14
Acrylonitrile	ND		ug/kg	10	0.51
n-Propylbenzene	ND		ug/kg	1.0	0.22
1,2,3-Trichlorobenzene	ND		ug/kg	5.0	0.25
1,2,4-Trichlorobenzene	ND		ug/kg	5.0	0.22
1,3,5-Trimethylbenzene	ND		ug/kg	5.0	0.16
1,2,4-Trimethylbenzene	ND		ug/kg	5.0	0.19
1,4-Dioxane	ND		ug/kg	40	14.
p-Diethylbenzene	ND		ug/kg	4.0	4.0
p-Ethyltoluene	ND		ug/kg	4.0	0.23
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.0	0.16
Ethyl ether	ND		ug/kg	5.0	0.26
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.0	0.39

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	97		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03,05-07 Batch: WG1074862-3 WG1074862-4								
Methylene chloride	87		83		70-130	5		30
1,1-Dichloroethane	118		113		70-130	4		30
Chloroform	104		101		70-130	3		30
Carbon tetrachloride	109		106		70-130	3		30
1,2-Dichloropropane	117		115		70-130	2		30
Dibromochloromethane	91		90		70-130	1		30
1,1,2-Trichloroethane	91		88		70-130	3		30
Tetrachloroethene	92		90		70-130	2		30
Chlorobenzene	89		87		70-130	2		30
Trichlorofluoromethane	102		97		70-139	5		30
1,2-Dichloroethane	116		112		70-130	4		30
1,1,1-Trichloroethane	108		104		70-130	4		30
Bromodichloromethane	104		101		70-130	3		30
trans-1,3-Dichloropropene	97		96		70-130	1		30
cis-1,3-Dichloropropene	111		109		70-130	2		30
1,1-Dichloropropene	108		104		70-130	4		30
Bromoform	88		86		70-130	2		30
1,1,2,2-Tetrachloroethane	80		80		70-130	0		30
Benzene	101		98		70-130	3		30
Toluene	85		83		70-130	2		30
Ethylbenzene	88		86		70-130	2		30
Chloromethane	116		110		52-130	5		30
Bromomethane	112		107		57-147	5		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03,05-07 Batch: WG1074862-3 WG1074862-4								
Vinyl chloride	101		95		67-130	6		30
Chloroethane	108		102		50-151	6		30
1,1-Dichloroethene	103		100		65-135	3		30
trans-1,2-Dichloroethene	104		100		70-130	4		30
Trichloroethene	105		102		70-130	3		30
1,2-Dichlorobenzene	82		80		70-130	2		30
1,3-Dichlorobenzene	82		81		70-130	1		30
1,4-Dichlorobenzene	81		81		70-130	0		30
Methyl tert butyl ether	111		108		66-130	3		30
p/m-Xylene	90		88		70-130	2		30
o-Xylene	92		90		70-130	2		30
cis-1,2-Dichloroethene	104		101		70-130	3		30
Dibromomethane	103		100		70-130	3		30
Styrene	88		86		70-130	2		30
Dichlorodifluoromethane	90		85		30-146	6		30
Acetone	123		120		54-140	2		30
Carbon disulfide	101		96		59-130	5		30
2-Butanone	106		114		70-130	7		30
Vinyl acetate	119		116		70-130	3		30
4-Methyl-2-pentanone	99		94		70-130	5		30
1,2,3-Trichloropropane	83		83		68-130	0		30
2-Hexanone	95		94		70-130	1		30
Bromochloromethane	112		106		70-130	6		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03,05-07 Batch: WG1074862-3 WG1074862-4								
2,2-Dichloropropane	116		111		70-130	4		30
1,2-Dibromoethane	89		88		70-130	1		30
1,3-Dichloropropane	91		90		69-130	1		30
1,1,1,2-Tetrachloroethane	92		91		70-130	1		30
Bromobenzene	82		81		70-130	1		30
n-Butylbenzene	83		80		70-130	4		30
sec-Butylbenzene	83		81		70-130	2		30
tert-Butylbenzene	82		80		70-130	2		30
o-Chlorotoluene	**66**	Q	85		70-130	25		30
p-Chlorotoluene	84		81		70-130	4		30
1,2-Dibromo-3-chloropropane	79		78		68-130	1		30
Hexachlorobutadiene	87		84		67-130	4		30
Isopropylbenzene	83		81		70-130	2		30
p-Isopropyltoluene	83		81		70-130	2		30
Naphthalene	84		85		70-130	1		30
Acrylonitrile	**136**	Q	129		70-130	5		30
n-Propylbenzene	81		80		70-130	1		30
1,2,3-Trichlorobenzene	87		86		70-130	1		30
1,2,4-Trichlorobenzene	87		86		70-130	1		30
1,3,5-Trimethylbenzene	83		81		70-130	2		30
1,2,4-Trimethylbenzene	83		82		70-130	1		30
1,4-Dioxane	105		103		65-136	2		30
p-Diethylbenzene	83		82		70-130	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-03,05-07 Batch: WG1074862-3 WG1074862-4								
p-Ethyltoluene	83		81		70-130	2		30
1,2,4,5-Tetramethylbenzene	82		81		70-130	1		30
Ethyl ether	110		105		67-130	5		30
trans-1,4-Dichloro-2-butene	99		97		70-130	2		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	106		104		70-130
Toluene-d8	96		96		70-130
4-Bromofluorobenzene	103		103		70-130
Dibromofluoromethane	107		106		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 09,11 Batch: WG1074916-3 WG1074916-4								
Methylene chloride	100		87		70-130	14		20
1,1-Dichloroethane	100		89		70-130	12		20
Chloroform	110		98		70-130	12		20
Carbon tetrachloride	120		98		63-132	20		20
1,2-Dichloropropane	110		90		70-130	20		20
Dibromochloromethane	110		90		63-130	20		20
1,1,2-Trichloroethane	100		91		70-130	9		20
Tetrachloroethene	110		92		70-130	18		20
Chlorobenzene	110		91		75-130	19		20
Trichlorofluoromethane	100		92		62-150	8		20
1,2-Dichloroethane	120		100		70-130	18		20
1,1,1-Trichloroethane	120		99		67-130	19		20
Bromodichloromethane	110		97		67-130	13		20
trans-1,3-Dichloropropene	97		78		70-130	**22**	Q	20
cis-1,3-Dichloropropene	110		89		70-130	**21**	Q	20
1,1-Dichloropropene	110		90		70-130	20		20
Bromoform	110		87		54-136	**23**	Q	20
1,1,2,2-Tetrachloroethane	100		86		67-130	15		20
Benzene	110		90		70-130	20		20
Toluene	100		86		70-130	15		20
Ethylbenzene	110		91		70-130	19		20
Chloromethane	66		**57**	Q	64-130	15		20
Bromomethane	96		84		39-139	13		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
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Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 09,11 Batch: WG1074916-3 WG1074916-4								
Vinyl chloride	75		65		55-140	14		20
Chloroethane	110		92		55-138	18		20
1,1-Dichloroethene	100		87		61-145	14		20
trans-1,2-Dichloroethene	100		88		70-130	13		20
Trichloroethene	120		96		70-130	**22**	Q	20
1,2-Dichlorobenzene	110		93		70-130	17		20
1,3-Dichlorobenzene	110		91		70-130	19		20
1,4-Dichlorobenzene	110		92		70-130	18		20
Methyl tert butyl ether	110		91		63-130	19		20
p/m-Xylene	115		95		70-130	19		20
o-Xylene	120		95		70-130	**23**	Q	20
cis-1,2-Dichloroethene	100		94		70-130	6		20
Dibromomethane	120		100		70-130	18		20
1,2,3-Trichloropropane	100		86		64-130	15		20
Acrylonitrile	97		84		70-130	14		20
Styrene	115		95		70-130	19		20
Dichlorodifluoromethane	88		77		36-147	13		20
Acetone	84		71		58-148	17		20
Carbon disulfide	92		79		51-130	15		20
2-Butanone	83		74		63-138	11		20
Vinyl acetate	82		**67**	Q	70-130	20		20
4-Methyl-2-pentanone	98		82		59-130	18		20
2-Hexanone	87		71		57-130	20		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 09,11 Batch: WG1074916-3 WG1074916-4								
Bromochloromethane	120		110		70-130	9		20
2,2-Dichloropropane	110		91		63-133	19		20
1,2-Dibromoethane	110		95		70-130	15		20
1,3-Dichloropropane	100		89		70-130	12		20
1,1,1,2-Tetrachloroethane	110		93		64-130	17		20
Bromobenzene	110		94		70-130	16		20
n-Butylbenzene	100		86		53-136	15		20
sec-Butylbenzene	100		85		70-130	16		20
tert-Butylbenzene	110		87		70-130	**23**	Q	20
o-Chlorotoluene	100		86		70-130	15		20
p-Chlorotoluene	100		85		70-130	16		20
1,2-Dibromo-3-chloropropane	100		88		41-144	13		20
Hexachlorobutadiene	120		100		63-130	18		20
Isopropylbenzene	110		86		70-130	**24**	Q	20
p-Isopropyltoluene	110		89		70-130	**21**	Q	20
Naphthalene	100		100		70-130	0		20
n-Propylbenzene	100		84		69-130	17		20
1,2,3-Trichlorobenzene	110		100		70-130	10		20
1,2,4-Trichlorobenzene	110		96		70-130	14		20
1,3,5-Trimethylbenzene	110		88		64-130	**22**	Q	20
1,2,4-Trimethylbenzene	110		88		70-130	**22**	Q	20
1,4-Dioxane	88		96		56-162	9		20
p-Diethylbenzene	110		88		70-130	**22**	Q	20

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 09,11 Batch: WG1074916-3 WG1074916-4								
p-Ethyltoluene	110		88		70-130	**22**	Q	20
1,2,4,5-Tetramethylbenzene	110		88		70-130	**22**	Q	20
Ethyl ether	98		88		59-134	11		20
trans-1,4-Dichloro-2-butene	72		**52**	Q	70-130	**32**	Q	20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	109		115		70-130
Toluene-d8	92		91		70-130
4-Bromofluorobenzene	90		90		70-130
Dibromofluoromethane	104		104		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 Batch: WG1075119-3 WG1075119-4								
Methylene chloride	96		94		70-130	2		30
1,1-Dichloroethane	99		99		70-130	0		30
Chloroform	99		98		70-130	1		30
Carbon tetrachloride	99		102		70-130	3		30
1,2-Dichloropropane	99		99		70-130	0		30
Dibromochloromethane	92		96		70-130	4		30
1,1,2-Trichloroethane	98		99		70-130	1		30
Tetrachloroethene	101		99		70-130	2		30
Chlorobenzene	97		96		70-130	1		30
Trichlorofluoromethane	106		105		70-139	1		30
1,2-Dichloroethane	98		98		70-130	0		30
1,1,1-Trichloroethane	101		101		70-130	0		30
Bromodichloromethane	95		97		70-130	2		30
trans-1,3-Dichloropropene	98		98		70-130	0		30
cis-1,3-Dichloropropene	96		97		70-130	1		30
1,1-Dichloropropene	102		101		70-130	1		30
Bromoform	90		95		70-130	5		30
1,1,2,2-Tetrachloroethane	101		101		70-130	0		30
Benzene	99		98		70-130	1		30
Toluene	99		98		70-130	1		30
Ethylbenzene	99		98		70-130	1		30
Chloromethane	103		101		52-130	2		30
Bromomethane	106		106		57-147	0		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 Batch: WG1075119-3 WG1075119-4								
Vinyl chloride	102		101		67-130	1		30
Chloroethane	102		100		50-151	2		30
1,1-Dichloroethene	102		101		65-135	1		30
trans-1,2-Dichloroethene	100		99		70-130	1		30
Trichloroethene	99		99		70-130	0		30
1,2-Dichlorobenzene	98		97		70-130	1		30
1,3-Dichlorobenzene	98		96		70-130	2		30
1,4-Dichlorobenzene	97		97		70-130	0		30
Methyl tert butyl ether	99		99		66-130	0		30
p/m-Xylene	99		98		70-130	1		30
o-Xylene	98		97		70-130	1		30
cis-1,2-Dichloroethene	98		97		70-130	1		30
Dibromomethane	98		99		70-130	1		30
Styrene	98		97		70-130	1		30
Dichlorodifluoromethane	108		108		30-146	0		30
Acetone	102		102		54-140	0		30
Carbon disulfide	100		98		59-130	2		30
2-Butanone	110		107		70-130	3		30
Vinyl acetate	100		103		70-130	3		30
4-Methyl-2-pentanone	98		97		70-130	1		30
1,2,3-Trichloropropane	101		99		68-130	2		30
2-Hexanone	99		97		70-130	2		30
Bromochloromethane	100		100		70-130	0		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 Batch: WG1075119-3 WG1075119-4								
2,2-Dichloropropane	102		101		70-130	1		30
1,2-Dibromoethane	99		99		70-130	0		30
1,3-Dichloropropane	99		100		69-130	1		30
1,1,1,2-Tetrachloroethane	95		97		70-130	2		30
Bromobenzene	98		97		70-130	1		30
n-Butylbenzene	102		101		70-130	1		30
sec-Butylbenzene	103		102		70-130	1		30
tert-Butylbenzene	102		100		70-130	2		30
o-Chlorotoluene	100		98		70-130	2		30
p-Chlorotoluene	99		99		70-130	0		30
1,2-Dibromo-3-chloropropane	94		96		68-130	2		30
Hexachlorobutadiene	100		98		67-130	2		30
Isopropylbenzene	102		100		70-130	2		30
p-Isopropyltoluene	102		100		70-130	2		30
Naphthalene	95		95		70-130	0		30
Acrylonitrile	100		98		70-130	2		30
n-Propylbenzene	101		100		70-130	1		30
1,2,3-Trichlorobenzene	95		96		70-130	1		30
1,2,4-Trichlorobenzene	97		97		70-130	0		30
1,3,5-Trimethylbenzene	101		100		70-130	1		30
1,2,4-Trimethylbenzene	100		99		70-130	1		30
1,4-Dioxane	108		103		65-136	5		30
p-Diethylbenzene	100		100		70-130	0		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 Batch: WG1075119-3 WG1075119-4								
p-Ethyltoluene	100		100		70-130	0		30
1,2,4,5-Tetramethylbenzene	98		98		70-130	0		30
Ethyl ether	99		98		67-130	1		30
trans-1,4-Dichloro-2-butene	104		104		70-130	0		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	98		100		70-130
Toluene-d8	101		100		70-130
4-Bromofluorobenzene	101		101		70-130
Dibromofluoromethane	100		100		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 QC Batch ID: WG1075119-6 WG1075119-7 QC Sample: L1745804-04 Client ID: SB002 (7-9)												
Methylene chloride	ND	112	85	76		85	79		70-130	0		30
1,1-Dichloroethane	ND	112	95	85		92	86		70-130	3		30
Chloroform	ND	112	90	80		87	80		70-130	3		30
Carbon tetrachloride	ND	112	100	93		97	90		70-130	7		30
1,2-Dichloropropane	ND	112	89	80		87	81		70-130	2		30
Dibromochloromethane	ND	112	85	75		84	78		70-130	0		30
1,1,2-Trichloroethane	ND	112	82	73		82	76		70-130	1		30
Tetrachloroethene	ND	112	86	76		72	**67**	Q	70-130	17		30
Chlorobenzene	ND	112	78	**69**	Q	69	**64**	Q	70-130	13		30
Trichlorofluoromethane	ND	112	110	98		100	94		70-139	8		30
1,2-Dichloroethane	ND	112	83	74		84	78		70-130	1		30
1,1,1-Trichloroethane	ND	112	100	90		95	88		70-130	6		30
Bromodichloromethane	ND	112	88	78		86	80		70-130	2		30
trans-1,3-Dichloropropene	ND	112	82	73		80	74		70-130	3		30
cis-1,3-Dichloropropene	ND	112	84	75		81	75		70-130	4		30
1,1-Dichloropropene	ND	112	99	88		90	83		70-130	9		30
Bromoform	ND	112	85	76		86	79		70-130	1		30
1,1,2,2-Tetrachloroethane	ND	112	78	**69**	Q	81	75		70-130	4		30
Benzene	ND	112	91	81		87	80		70-130	6		30
Toluene	ND	112	86	76		77	71		70-130	11		30
Ethylbenzene	ND	112	80	71		67	**62**	Q	70-130	17		30
Chloromethane	ND	112	100	89		100	94		52-130	2		30
Bromomethane	ND	112	93	83		95	88		57-147	1		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 QC Batch ID: WG1075119-6 WG1075119-7 QC Sample: L1745804-04 Client ID: SB002 (7-9)												
Vinyl chloride	ND	112	110	96		110	99		67-130	1		30
Chloroethane	ND	112	100	89		34	**31**	Q	50-151	**99**	Q	30
1,1-Dichloroethene	ND	112	110	94		100	94		65-135	4		30
trans-1,2-Dichloroethene	ND	112	97	87		92	85		70-130	6		30
Trichloroethene	ND	112	91	81		83	77		70-130	9		30
1,2-Dichlorobenzene	ND	112	68	**61**	Q	61	**56**	Q	70-130	12		30
1,3-Dichlorobenzene	ND	112	66	**59**	Q	56	**52**	Q	70-130	17		30
1,4-Dichlorobenzene	ND	112	64	**57**	Q	54	**50**	Q	70-130	17		30
Methyl tert butyl ether	ND	112	83	74		87	81		66-130	4		30
p/m-Xylene	ND	224	160	**69**	Q	130	**60**	Q	70-130	18		30
o-Xylene	ND	224	160	70		140	**62**	Q	70-130	14		30
cis-1,2-Dichloroethene	ND	112	91	81		88	82		70-130	3		30
Dibromomethane	ND	112	82	73		83	77		70-130	1		30
Styrene	ND	224	150	**68**	Q	130	**62**	Q	70-130	13		30
Dichlorodifluoromethane	ND	112	120	102		110	102		30-146	4		30
Acetone	ND	112	81	72		92	85		54-140	13		30
Carbon disulfide	ND	112	99	88		92	85		59-130	8		30
2-Butanone	ND	112	78	70		90	83		70-130	14		30
Vinyl acetate	ND	112	52	**46**	Q	31	**28**	Q	70-130	**51**	Q	30
4-Methyl-2-pentanone	ND	112	78	**69**	Q	83	77		70-130	6		30
1,2,3-Trichloropropane	ND	112	76	68		78	72		68-130	2		30
2-Hexanone	ND	112	76	**68**	Q	82	76		70-130	7		30
Bromochloromethane	ND	112	88	78		87	80		70-130	1		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1745804

Project Number: BBU1702 ***Report Date:*** 12/21/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 QC Batch ID: WG1075119-6 WG1075119-7 QC Sample: L1745804-04 Client ID: SB002 (7-9)												
2,2-Dichloropropane	ND	112	100	89		94	87		70-130	6		30
1,2-Dibromoethane	ND	112	80	71		80	74		70-130	1		30
1,3-Dichloropropane	ND	112	81	72		81	75		69-130	1		30
1,1,1,2-Tetrachloroethane	ND	112	87	77		81	75		70-130	7		30
Bromobenzene	ND	112	74	**66**	Q	66	**61**	Q	70-130	12		30
n-Butylbenzene	ND	112	61	**54**	Q	45	**42**	Q	70-130	30		30
sec-Butylbenzene	ND	112	72	**64**	Q	55	**51**	Q	70-130	26		30
tert-Butylbenzene	ND	112	76	**67**	Q	60	**56**	Q	70-130	23		30
o-Chlorotoluene	ND	112	72	**64**	Q	59	**54**	Q	70-130	20		30
p-Chlorotoluene	ND	112	68	**61**	Q	56	**52**	Q	70-130	19		30
1,2-Dibromo-3-chloropropane	ND	112	78	69		82	76		68-130	5		30
Hexachlorobutadiene	ND	112	56	**50**	Q	40	**37**	Q	67-130	**33**	Q	30
Isopropylbenzene	ND	112	78	70		64	**59**	Q	70-130	21		30
p-Isopropyltoluene	ND	112	67	**59**	Q	51	**47**	Q	70-130	26		30
Naphthalene	ND	112	68	**60**	Q	67	**62**	Q	70-130	1		30
Acrylonitrile	ND	112	78	**69**	Q	83	77		70-130	6		30
n-Propylbenzene	ND	112	72	**64**	Q	56	**52**	Q	70-130	24		30
1,2,3-Trichlorobenzene	ND	112	61	**55**	Q	55	**51**	Q	70-130	11		30
1,2,4-Trichlorobenzene	ND	112	58	**51**	Q	50	**47**	Q	70-130	14		30
1,3,5-Trimethylbenzene	ND	112	72	**64**	Q	58	**54**	Q	70-130	21		30
1,2,4-Trimethylbenzene	ND	112	70	**62**	Q	57	**52**	Q	70-130	20		30
1,4-Dioxane	ND	5610	5500	98		5600	104		65-136	2		30
p-Diethylbenzene	ND	112	61	**54**	Q	46	**43**	Q	70-130	27		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 04,08,10 QC Batch ID: WG1075119-6 WG1075119-7 QC Sample: L1745804-04 Client ID: SB002 (7-9)												
p-Ethyltoluene	ND	112	69	**62**	Q	55	**50**	Q	70-130	24		30
1,2,4,5-Tetramethylbenzene	ND	112	63	**56**	Q	51	**48**	Q	70-130	20		30
Ethyl ether	ND	112	85	76		88	81		67-130	3		30
trans-1,4-Dichloro-2-butene	ND	112	79	70		82	76		70-130	4		30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	99		98		70-130
4-Bromofluorobenzene	101		102		70-130
Dibromofluoromethane	99		98		70-130
Toluene-d8	99		98		70-130

SEMIVOLATILES

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01
Client ID: SB001 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 16:50
Analyst: EK
Percent Solids: 94%

Date Collected: 12/11/17 09:00
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	140	18.	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	20.	1
Hexachlorobenzene	ND		ug/kg	110	20.	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	24.	1
2-Chloronaphthalene	ND		ug/kg	180	18.	1
1,2-Dichlorobenzene	ND		ug/kg	180	32.	1
1,3-Dichlorobenzene	ND		ug/kg	180	30.	1
1,4-Dichlorobenzene	ND		ug/kg	180	31.	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	47.	1
2,4-Dinitrotoluene	ND		ug/kg	180	35.	1
2,6-Dinitrotoluene	ND		ug/kg	180	30.	1
Fluoranthene	ND		ug/kg	110	20.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	180	19.	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	27.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	210	30.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	18.	1
Hexachlorobutadiene	ND		ug/kg	180	26.	1
Hexachlorocyclopentadiene	ND		ug/kg	510	160	1
Hexachloroethane	ND		ug/kg	140	29.	1
Isophorone	ND		ug/kg	160	23.	1
Naphthalene	ND		ug/kg	180	22.	1
Nitrobenzene	ND		ug/kg	160	26.	1
NDPA/DPA	ND		ug/kg	140	20.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	180	27.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	61.	1
Butyl benzyl phthalate	ND		ug/kg	180	45.	1
Di-n-butylphthalate	ND		ug/kg	180	34.	1
Di-n-octylphthalate	ND		ug/kg	180	60.	1
Diethyl phthalate	ND		ug/kg	180	16.	1
Dimethyl phthalate	ND		ug/kg	180	37.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01 Date Collected: 12/11/17 09:00

Client ID: SB001 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	20.	1
Benzo(a)pyrene	ND		ug/kg	140	43.	1
Benzo(b)fluoranthene	ND		ug/kg	110	30.	1
Benzo(k)fluoranthene	ND		ug/kg	110	28.	1
Chrysene	ND		ug/kg	110	18.	1
Acenaphthylene	ND		ug/kg	140	27.	1
Anthracene	ND		ug/kg	110	35.	1
Benzo(ghi)perylene	ND		ug/kg	140	21.	1
Fluorene	ND		ug/kg	180	17.	1
Phenanthrene	ND		ug/kg	110	22.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	20.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	25.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	400	41.	1
4-Chloroaniline	ND		ug/kg	180	32.	1
2-Nitroaniline	ND		ug/kg	180	34.	1
3-Nitroaniline	ND		ug/kg	180	33.	1
4-Nitroaniline	ND		ug/kg	180	73.	1
Dibenzofuran	ND		ug/kg	180	17.	1
2-Methylnaphthalene	ND		ug/kg	210	21.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	180	18.	1
Acetophenone	ND		ug/kg	180	22.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	34.	1
p-Chloro-m-cresol	ND		ug/kg	180	26.	1
2-Chlorophenol	ND		ug/kg	180	21.	1
2,4-Dichlorophenol	ND		ug/kg	160	28.	1
2,4-Dimethylphenol	ND		ug/kg	180	58.	1
2-Nitrophenol	ND		ug/kg	380	67.	1
4-Nitrophenol	ND		ug/kg	250	72.	1
2,4-Dinitrophenol	ND		ug/kg	850	83.	1
4,6-Dinitro-o-cresol	ND		ug/kg	460	85.	1
Pentachlorophenol	ND		ug/kg	140	39.	1
Phenol	ND		ug/kg	180	27.	1
2-Methylphenol	ND		ug/kg	180	28.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	28.	1
2,4,5-Trichlorophenol	ND		ug/kg	180	34.	1
Benzoic Acid	ND		ug/kg	580	180	1
Benzyl Alcohol	ND		ug/kg	180	54.	1
Carbazole	ND		ug/kg	180	17.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01 Date Collected: 12/11/17 09:00

Client ID: SB001 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	77		25-120
Phenol-d6	77		10-120
Nitrobenzene-d5	70		23-120
2-Fluorobiphenyl	79		30-120
2,4,6-Tribromophenol	81		10-136
4-Terphenyl-d14	62		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02
Client ID: SB001 (8-10)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 17:15
Analyst: EK
Percent Solids: 87%

Date Collected: 12/11/17 09:15
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	ND		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	31.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	65.	1
Butyl benzyl phthalate	ND		ug/kg	190	48.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	18.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02 Date Collected: 12/11/17 09:15

Client ID: SB001 (8-10) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	21.	1
Benzo(a)pyrene	ND		ug/kg	150	46.	1
Benzo(b)fluoranthene	ND		ug/kg	110	32.	1
Benzo(k)fluoranthene	ND		ug/kg	110	30.	1
Chrysene	ND		ug/kg	110	20.	1
Acenaphthylene	ND		ug/kg	150	29.	1
Anthracene	ND		ug/kg	110	37.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	ND		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	26.	1
Pyrene	ND		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	410	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	910	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	91.	1
Pentachlorophenol	ND		ug/kg	150	42.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	ND		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02 Date Collected: 12/11/17 09:15

Client ID: SB001 (8-10) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	88		25-120
Phenol-d6	86		10-120
Nitrobenzene-d5	83		23-120
2-Fluorobiphenyl	92		30-120
2,4,6-Tribromophenol	93		10-136
4-Terphenyl-d14	91		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03
Client ID: SB002 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 18:32
Analyst: EK
Percent Solids: 85%

Date Collected: 12/11/17 09:40
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	160	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	22.	1
Hexachlorobenzene	ND		ug/kg	120	22.	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	27.	1
2-Chloronaphthalene	ND		ug/kg	200	19.	1
1,2-Dichlorobenzene	ND		ug/kg	200	35.	1
1,3-Dichlorobenzene	ND		ug/kg	200	34.	1
1,4-Dichlorobenzene	ND		ug/kg	200	34.	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	52.	1
2,4-Dinitrotoluene	ND		ug/kg	200	39.	1
2,6-Dinitrotoluene	ND		ug/kg	200	34.	1
Fluoranthene	550		ug/kg	120	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	200	21.	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	30.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	240	34.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	20.	1
Hexachlorobutadiene	ND		ug/kg	200	29.	1
Hexachlorocyclopentadiene	ND		ug/kg	560	180	1
Hexachloroethane	ND		ug/kg	160	32.	1
Isophorone	ND		ug/kg	180	25.	1
Naphthalene	ND		ug/kg	200	24.	1
Nitrobenzene	ND		ug/kg	180	29.	1
NDPA/DPA	ND		ug/kg	160	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	200	30.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	200	68.	1
Butyl benzyl phthalate	ND		ug/kg	200	49.	1
Di-n-butylphthalate	ND		ug/kg	200	37.	1
Di-n-octylphthalate	ND		ug/kg	200	67.	1
Diethyl phthalate	ND		ug/kg	200	18.	1
Dimethyl phthalate	ND		ug/kg	200	41.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03 Date Collected: 12/11/17 09:40

Client ID: SB002 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	340		ug/kg	120	22.	1
Benzo(a)pyrene	310		ug/kg	160	48.	1
Benzo(b)fluoranthene	400		ug/kg	120	33.	1
Benzo(k)fluoranthene	160		ug/kg	120	31.	1
Chrysene	320		ug/kg	120	20.	1
Acenaphthylene	190		ug/kg	160	30.	1
Anthracene	110	J	ug/kg	120	38.	1
Benzo(ghi)perylene	210		ug/kg	160	23.	1
Fluorene	19	J	ug/kg	200	19.	1
Phenanthrene	260		ug/kg	120	24.	1
Dibenzo(a,h)anthracene	53	J	ug/kg	120	23.	1
Indeno(1,2,3-cd)pyrene	210		ug/kg	160	27.	1
Pyrene	460		ug/kg	120	20.	1
Biphenyl	ND		ug/kg	450	46.	1
4-Chloroaniline	ND		ug/kg	200	36.	1
2-Nitroaniline	ND		ug/kg	200	38.	1
3-Nitroaniline	ND		ug/kg	200	37.	1
4-Nitroaniline	ND		ug/kg	200	81.	1
Dibenzofuran	ND		ug/kg	200	18.	1
2-Methylnaphthalene	ND		ug/kg	240	24.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	200	20.	1
Acetophenone	ND		ug/kg	200	24.	1
2,4,6-Trichlorophenol	ND		ug/kg	120	37.	1
p-Chloro-m-cresol	ND		ug/kg	200	29.	1
2-Chlorophenol	ND		ug/kg	200	23.	1
2,4-Dichlorophenol	ND		ug/kg	180	32.	1
2,4-Dimethylphenol	ND		ug/kg	200	65.	1
2-Nitrophenol	ND		ug/kg	420	74.	1
4-Nitrophenol	ND		ug/kg	270	80.	1
2,4-Dinitrophenol	ND		ug/kg	940	92.	1
4,6-Dinitro-o-cresol	ND		ug/kg	510	94.	1
Pentachlorophenol	ND		ug/kg	160	43.	1
Phenol	ND		ug/kg	200	30.	1
2-Methylphenol	ND		ug/kg	200	30.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	31.	1
2,4,5-Trichlorophenol	ND		ug/kg	200	38.	1
Benzoic Acid	ND		ug/kg	640	200	1
Benzyl Alcohol	ND		ug/kg	200	60.	1
Carbazole	19	J	ug/kg	200	19.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03 Date Collected: 12/11/17 09:40

Client ID: SB002 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	71		25-120
Phenol-d6	72		10-120
Nitrobenzene-d5	67		23-120
2-Fluorobiphenyl	71		30-120
2,4,6-Tribromophenol	82		10-136
4-Terphenyl-d14	61		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04
Client ID: SB002 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 17:41
Analyst: EK
Percent Solids: 89%

Date Collected: 12/11/17 09:50
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	190	18.	1
1,2-Dichlorobenzene	ND		ug/kg	190	33.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	32.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	49.	1
2,4-Dinitrotoluene	ND		ug/kg	190	37.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	ND		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	530	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	64.	1
Butyl benzyl phthalate	ND		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	35.	1
Di-n-octylphthalate	ND		ug/kg	190	63.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	39.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04 Date Collected: 12/11/17 09:50

Client ID: SB002 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	21.	1
Benzo(a)pyrene	ND		ug/kg	150	45.	1
Benzo(b)fluoranthene	ND		ug/kg	110	31.	1
Benzo(k)fluoranthene	ND		ug/kg	110	30.	1
Chrysene	ND		ug/kg	110	19.	1
Acenaphthylene	ND		ug/kg	150	29.	1
Anthracene	ND		ug/kg	110	36.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	ND		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	26.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	420	43.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	35.	1
4-Nitroaniline	ND		ug/kg	190	77.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	19.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	61.	1
2-Nitrophenol	ND		ug/kg	400	70.	1
4-Nitrophenol	ND		ug/kg	260	76.	1
2,4-Dinitrophenol	ND		ug/kg	890	87.	1
4,6-Dinitro-o-cresol	ND		ug/kg	480	89.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	600	190	1
Benzyl Alcohol	ND		ug/kg	190	57.	1
Carbazole	ND		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04 Date Collected: 12/11/17 09:50

Client ID: SB002 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	76		25-120
Phenol-d6	77		10-120
Nitrobenzene-d5	73		23-120
2-Fluorobiphenyl	82		30-120
2,4,6-Tribromophenol	81		10-136
4-Terphenyl-d14	70		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05
Client ID: SB003 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 19:23
Analyst: EK
Percent Solids: 86%

Date Collected: 12/11/17 12:15
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	40	J	ug/kg	160	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	120	22.	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	35.	1
1,3-Dichlorobenzene	ND		ug/kg	190	33.	1
1,4-Dichlorobenzene	ND		ug/kg	190	34.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	52.	1
2,4-Dinitrotoluene	ND		ug/kg	190	39.	1
2,6-Dinitrotoluene	ND		ug/kg	190	33.	1
Fluoranthene	2800		ug/kg	120	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	21.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	30.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	33.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	560	180	1
Hexachloroethane	ND		ug/kg	160	31.	1
Isophorone	ND		ug/kg	180	25.	1
Naphthalene	200		ug/kg	190	24.	1
Nitrobenzene	ND		ug/kg	180	29.	1
NDPA/DPA	ND		ug/kg	160	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	30.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	67.	1
Butyl benzyl phthalate	56	J	ug/kg	190	49.	1
Di-n-butylphthalate	ND		ug/kg	190	37.	1
Di-n-octylphthalate	ND		ug/kg	190	66.	1
Diethyl phthalate	ND		ug/kg	190	18.	1
Dimethyl phthalate	ND		ug/kg	190	41.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05 Date Collected: 12/11/17 12:15

Client ID: SB003 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	1400		ug/kg	120	22.	1
Benzo(a)pyrene	1200		ug/kg	160	47.	1
Benzo(b)fluoranthene	1600		ug/kg	120	33.	1
Benzo(k)fluoranthene	670		ug/kg	120	31.	1
Chrysene	1300		ug/kg	120	20.	1
Acenaphthylene	880		ug/kg	160	30.	1
Anthracene	540		ug/kg	120	38.	1
Benzo(ghi)perylene	730		ug/kg	160	23.	1
Fluorene	140	J	ug/kg	190	19.	1
Phenanthrene	1500		ug/kg	120	24.	1
Dibenzo(a,h)anthracene	220		ug/kg	120	22.	1
Indeno(1,2,3-cd)pyrene	820		ug/kg	160	27.	1
Pyrene	2200		ug/kg	120	19.	1
Biphenyl	ND		ug/kg	440	45.	1
4-Chloroaniline	ND		ug/kg	190	35.	1
2-Nitroaniline	ND		ug/kg	190	37.	1
3-Nitroaniline	ND		ug/kg	190	37.	1
4-Nitroaniline	ND		ug/kg	190	80.	1
Dibenzofuran	120	J	ug/kg	190	18.	1
2-Methylnaphthalene	98	J	ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	24.	1
2,4,6-Trichlorophenol	ND		ug/kg	120	37.	1
p-Chloro-m-cresol	ND		ug/kg	190	29.	1
2-Chlorophenol	ND		ug/kg	190	23.	1
2,4-Dichlorophenol	ND		ug/kg	180	31.	1
2,4-Dimethylphenol	ND		ug/kg	190	64.	1
2-Nitrophenol	ND		ug/kg	420	73.	1
4-Nitrophenol	ND		ug/kg	270	79.	1
2,4-Dinitrophenol	ND		ug/kg	930	91.	1
4,6-Dinitro-o-cresol	ND		ug/kg	500	93.	1
Pentachlorophenol	ND		ug/kg	160	43.	1
Phenol	ND		ug/kg	190	29.	1
2-Methylphenol	ND		ug/kg	190	30.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	37.	1
Benzoic Acid	ND		ug/kg	630	200	1
Benzyl Alcohol	ND		ug/kg	190	60.	1
Carbazole	210		ug/kg	190	19.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05 Date Collected: 12/11/17 12:15

Client ID: SB003 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	76		25-120
Phenol-d6	78		10-120
Nitrobenzene-d5	80		23-120
2-Fluorobiphenyl	72		30-120
2,4,6-Tribromophenol	82		10-136
4-Terphenyl-d14	62		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06
Client ID: SB003 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 19:48
Analyst: EK
Percent Solids: 87%

Date Collected: 12/11/17 12:25
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	200		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	31.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	83	J	ug/kg	190	65.	1
Butyl benzyl phthalate	ND		ug/kg	190	48.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	18.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06 Date Collected: 12/11/17 12:25

Client ID: SB003 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	120		ug/kg	110	21.	1
Benzo(a)pyrene	160		ug/kg	150	46.	1
Benzo(b)fluoranthene	240		ug/kg	110	32.	1
Benzo(k)fluoranthene	79	J	ug/kg	110	30.	1
Chrysene	150		ug/kg	110	20.	1
Acenaphthylene	77	J	ug/kg	150	29.	1
Anthracene	62	J	ug/kg	110	37.	1
Benzo(ghi)perylene	120	J	ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	110		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	35	J	ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	130	J	ug/kg	150	26.	1
Pyrene	210		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	410	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	910	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	91.	1
Pentachlorophenol	ND		ug/kg	150	42.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	48	J	ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06 Date Collected: 12/11/17 12:25

Client ID: SB003 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	**21**	Q	25-120
Phenol-d6	54		10-120
Nitrobenzene-d5	74		23-120
2-Fluorobiphenyl	72		30-120
2,4,6-Tribromophenol	14		10-136
4-Terphenyl-d14	64		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07
Client ID: SB004 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 18:57
Analyst: EK
Percent Solids: 88%

Date Collected: 12/11/17 12:40
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	230		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	65.	1
Butyl benzyl phthalate	ND		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	39.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07 Date Collected: 12/11/17 12:40

Client ID: SB004 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	100	J	ug/kg	110	21.	1
Benzo(a)pyrene	100	J	ug/kg	150	46.	1
Benzo(b)fluoranthene	140		ug/kg	110	32.	1
Benzo(k)fluoranthene	47	J	ug/kg	110	30.	1
Chrysene	110		ug/kg	110	20.	1
Acenaphthylene	56	J	ug/kg	150	29.	1
Anthracene	ND		ug/kg	110	37.	1
Benzo(ghi)perylene	69	J	ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	110		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	71	J	ug/kg	150	26.	1
Pyrene	180		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	35.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	220	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	400	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	900	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	90.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	57.	1
Carbazole	21	J	ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07 Date Collected: 12/11/17 12:40

Client ID: SB004 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	48		25-120
Phenol-d6	75		10-120
Nitrobenzene-d5	76		23-120
2-Fluorobiphenyl	72		30-120
2,4,6-Tribromophenol	39		10-136
4-Terphenyl-d14	63		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08
Client ID: SB004 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 20:14
Analyst: EK
Percent Solids: 86%

Date Collected: 12/11/17 12:50
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	43	J	ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	3000		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	140	J	ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	65.	1
Butyl benzyl phthalate	70	J	ug/kg	190	48.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08 Date Collected: 12/11/17 12:50

Client ID: SB004 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	1200		ug/kg	110	21.	1
Benzo(a)pyrene	930		ug/kg	150	46.	1
Benzo(b)fluoranthene	1300		ug/kg	110	32.	1
Benzo(k)fluoranthene	430		ug/kg	110	30.	1
Chrysene	1100		ug/kg	110	20.	1
Acenaphthylene	680		ug/kg	150	29.	1
Anthracene	510		ug/kg	110	37.	1
Benzo(ghi)perylene	510		ug/kg	150	22.	1
Fluorene	270		ug/kg	190	18.	1
Phenanthrene	1900		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	170		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	600		ug/kg	150	26.	1
Pyrene	2200		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	110	J	ug/kg	190	18.	1
2-Methylnaphthalene	65	J	ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	63	J	ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	410	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	900	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	90.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	140	J	ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08 Date Collected: 12/11/17 12:50

Client ID: SB004 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	64		25-120
Phenol-d6	77		10-120
Nitrobenzene-d5	77		23-120
2-Fluorobiphenyl	70		30-120
2,4,6-Tribromophenol	57		10-136
4-Terphenyl-d14	62		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09
Client ID: FIELD BLANK 001
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 12/18/17 15:08
Analyst: EK

Date Collected: 12/11/17 10:30
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 12/17/17 11:26

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	2.0	0.59	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	0.66	1
Hexachlorobenzene	ND		ug/l	2.0	0.58	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	0.67	1
2-Chloronaphthalene	ND		ug/l	2.0	0.64	1
1,2-Dichlorobenzene	ND		ug/l	2.0	0.73	1
1,3-Dichlorobenzene	ND		ug/l	2.0	0.69	1
1,4-Dichlorobenzene	ND		ug/l	2.0	0.71	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	1.4	1
2,4-Dinitrotoluene	ND		ug/l	5.0	0.84	1
2,6-Dinitrotoluene	ND		ug/l	5.0	1.1	1
Fluoranthene	ND		ug/l	2.0	0.57	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	0.62	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	0.73	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	0.70	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	0.63	1
Hexachlorobutadiene	ND		ug/l	2.0	0.72	1
Hexachlorocyclopentadiene	ND		ug/l	20	7.8	1
Hexachloroethane	ND		ug/l	2.0	0.68	1
Isophorone	ND		ug/l	5.0	0.60	1
Naphthalene	ND		ug/l	2.0	0.68	1
Nitrobenzene	ND		ug/l	2.0	0.75	1
NDPA/DPA	ND		ug/l	2.0	0.64	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	0.70	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	0.91	1
Butyl benzyl phthalate	ND		ug/l	5.0	1.3	1
Di-n-butylphthalate	ND		ug/l	5.0	0.69	1
Di-n-octylphthalate	ND		ug/l	5.0	1.1	1
Diethyl phthalate	ND		ug/l	5.0	0.63	1
Dimethyl phthalate	ND		ug/l	5.0	0.65	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09 Date Collected: 12/11/17 10:30

Client ID: FIELD BLANK 001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/l	2.0	0.61	1
Benzo(a)pyrene	ND		ug/l	2.0	0.54	1
Benzo(b)fluoranthene	ND		ug/l	2.0	0.64	1
Benzo(k)fluoranthene	ND		ug/l	2.0	0.60	1
Chrysene	ND		ug/l	2.0	0.54	1
Acenaphthylene	ND		ug/l	2.0	0.66	1
Anthracene	ND		ug/l	2.0	0.64	1
Benzo(ghi)perylene	ND		ug/l	2.0	0.61	1
Fluorene	ND		ug/l	2.0	0.62	1
Phenanthrene	ND		ug/l	2.0	0.61	1
Dibenzo(a,h)anthracene	ND		ug/l	2.0	0.55	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	0.71	1
Pyrene	ND		ug/l	2.0	0.57	1
Biphenyl	ND		ug/l	2.0	0.76	1
4-Chloroaniline	ND		ug/l	5.0	0.63	1
2-Nitroaniline	ND		ug/l	5.0	1.1	1
3-Nitroaniline	ND		ug/l	5.0	1.2	1
4-Nitroaniline	ND		ug/l	5.0	1.3	1
Dibenzofuran	ND		ug/l	2.0	0.66	1
2-Methylnaphthalene	ND		ug/l	2.0	0.72	1
1,2,4,5-Tetrachlorobenzene	ND		ug/l	10	0.67	1
Acetophenone	ND		ug/l	5.0	0.85	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	0.68	1
p-Chloro-m-cresol	ND		ug/l	2.0	0.62	1
2-Chlorophenol	ND		ug/l	2.0	0.63	1
2,4-Dichlorophenol	ND		ug/l	5.0	0.77	1
2,4-Dimethylphenol	ND		ug/l	5.0	1.6	1
2-Nitrophenol	ND		ug/l	10	1.5	1
4-Nitrophenol	ND		ug/l	10	1.8	1
2,4-Dinitrophenol	ND		ug/l	20	5.5	1
4,6-Dinitro-o-cresol	ND		ug/l	10	2.1	1
Pentachlorophenol	ND		ug/l	10	3.4	1
Phenol	ND		ug/l	5.0	1.9	1
2-Methylphenol	ND		ug/l	5.0	1.0	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	1.1	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	0.72	1
Benzoic Acid	ND		ug/l	50	13.	1
Benzyl Alcohol	ND		ug/l	2.0	0.72	1
Carbazole	ND		ug/l	2.0	0.63	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09 Date Collected: 12/11/17 10:30

Client ID: FIELD BLANK 001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	50		21-120
Phenol-d6	35		10-120
Nitrobenzene-d5	78		23-120
2-Fluorobiphenyl	91		15-120
2,4,6-Tribromophenol	90		10-120
4-Terphenyl-d14	101		41-149

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10
Client ID: DUP001
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/19/17 18:06
Analyst: EK
Percent Solids: 90%

Date Collected: 12/11/17 00:00
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 21:28

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	21.	1
Hexachlorobenzene	ND		ug/kg	110	20.	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	25.	1
2-Chloronaphthalene	ND		ug/kg	180	18.	1
1,2-Dichlorobenzene	ND		ug/kg	180	33.	1
1,3-Dichlorobenzene	ND		ug/kg	180	31.	1
1,4-Dichlorobenzene	ND		ug/kg	180	32.	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	49.	1
2,4-Dinitrotoluene	ND		ug/kg	180	36.	1
2,6-Dinitrotoluene	ND		ug/kg	180	31.	1
Fluoranthene	ND		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	180	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	31.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	18.	1
Hexachlorobutadiene	ND		ug/kg	180	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	520	160	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	160	24.	1
Naphthalene	ND		ug/kg	180	22.	1
Nitrobenzene	ND		ug/kg	160	27.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	180	28.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	63.	1
Butyl benzyl phthalate	ND		ug/kg	180	46.	1
Di-n-butylphthalate	ND		ug/kg	180	35.	1
Di-n-octylphthalate	ND		ug/kg	180	62.	1
Diethyl phthalate	ND		ug/kg	180	17.	1
Dimethyl phthalate	ND		ug/kg	180	38.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10 Date Collected: 12/11/17 00:00

Client ID: DUP001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	20.	1
Benzo(a)pyrene	ND		ug/kg	150	45.	1
Benzo(b)fluoranthene	ND		ug/kg	110	31.	1
Benzo(k)fluoranthene	ND		ug/kg	110	29.	1
Chrysene	ND		ug/kg	110	19.	1
Acenaphthylene	ND		ug/kg	150	28.	1
Anthracene	ND		ug/kg	110	36.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	180	18.	1
Phenanthrene	ND		ug/kg	110	22.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	21.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	25.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	420	42.	1
4-Chloroaniline	ND		ug/kg	180	33.	1
2-Nitroaniline	ND		ug/kg	180	35.	1
3-Nitroaniline	ND		ug/kg	180	34.	1
4-Nitroaniline	ND		ug/kg	180	76.	1
Dibenzofuran	ND		ug/kg	180	17.	1
2-Methylnaphthalene	ND		ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	180	19.	1
Acetophenone	ND		ug/kg	180	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	180	27.	1
2-Chlorophenol	ND		ug/kg	180	22.	1
2,4-Dichlorophenol	ND		ug/kg	160	29.	1
2,4-Dimethylphenol	ND		ug/kg	180	60.	1
2-Nitrophenol	ND		ug/kg	400	69.	1
4-Nitrophenol	ND		ug/kg	260	75.	1
2,4-Dinitrophenol	ND		ug/kg	880	85.	1
4,6-Dinitro-o-cresol	ND		ug/kg	480	88.	1
Pentachlorophenol	ND		ug/kg	150	40.	1
Phenol	ND		ug/kg	180	28.	1
2-Methylphenol	ND		ug/kg	180	28.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	180	35.	1
Benzoic Acid	ND		ug/kg	590	180	1
Benzyl Alcohol	ND		ug/kg	180	56.	1
Carbazole	ND		ug/kg	180	18.	1

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10 Date Collected: 12/11/17 00:00

Client ID: DUP001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	81		25-120
Phenol-d6	77		10-120
Nitrobenzene-d5	73		23-120
2-Fluorobiphenyl	81		30-120
2,4,6-Tribromophenol	81		10-136
4-Terphenyl-d14	81		18-120

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/18/17 13:51
Analyst: CB

Extraction Method: EPA 3510C
Extraction Date: 12/17/17 11:26

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 09 Batch: WG1073669-1					
Acenaphthene	ND		ug/l	2.0	0.59
1,2,4-Trichlorobenzene	ND		ug/l	5.0	0.66
Hexachlorobenzene	ND		ug/l	2.0	0.58
Bis(2-chloroethyl)ether	ND		ug/l	2.0	0.67
2-Chloronaphthalene	ND		ug/l	2.0	0.64
1,2-Dichlorobenzene	ND		ug/l	2.0	0.73
1,3-Dichlorobenzene	ND		ug/l	2.0	0.69
1,4-Dichlorobenzene	ND		ug/l	2.0	0.71
3,3'-Dichlorobenzidine	ND		ug/l	5.0	1.4
2,4-Dinitrotoluene	ND		ug/l	5.0	0.84
2,6-Dinitrotoluene	ND		ug/l	5.0	1.1
Fluoranthene	ND		ug/l	2.0	0.57
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	0.62
4-Bromophenyl phenyl ether	ND		ug/l	2.0	0.73
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	0.70
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	0.63
Hexachlorobutadiene	ND		ug/l	2.0	0.72
Hexachlorocyclopentadiene	ND		ug/l	20	7.8
Hexachloroethane	ND		ug/l	2.0	0.68
Isophorone	ND		ug/l	5.0	0.60
Naphthalene	ND		ug/l	2.0	0.68
Nitrobenzene	ND		ug/l	2.0	0.75
NDPA/DPA	ND		ug/l	2.0	0.64
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	0.70
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	0.91
Butyl benzyl phthalate	ND		ug/l	5.0	1.3
Di-n-butylphthalate	ND		ug/l	5.0	0.69
Di-n-octylphthalate	ND		ug/l	5.0	1.1
Diethyl phthalate	ND		ug/l	5.0	0.63

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/18/17 13:51
Analyst: CB

Extraction Method: EPA 3510C
Extraction Date: 12/17/17 11:26

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 09 Batch: WG1073669-1					
Dimethyl phthalate	ND		ug/l	5.0	0.65
Benzo(a)anthracene	ND		ug/l	2.0	0.61
Benzo(a)pyrene	ND		ug/l	2.0	0.54
Benzo(b)fluoranthene	ND		ug/l	2.0	0.64
Benzo(k)fluoranthene	ND		ug/l	2.0	0.60
Chrysene	ND		ug/l	2.0	0.54
Acenaphthylene	ND		ug/l	2.0	0.66
Anthracene	ND		ug/l	2.0	0.64
Benzo(ghi)perylene	ND		ug/l	2.0	0.61
Fluorene	ND		ug/l	2.0	0.62
Phenanthrene	ND		ug/l	2.0	0.61
Dibenzo(a,h)anthracene	ND		ug/l	2.0	0.55
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	0.71
Pyrene	ND		ug/l	2.0	0.57
Biphenyl	ND		ug/l	2.0	0.76
4-Chloroaniline	ND		ug/l	5.0	0.63
2-Nitroaniline	ND		ug/l	5.0	1.1
3-Nitroaniline	ND		ug/l	5.0	1.2
4-Nitroaniline	ND		ug/l	5.0	1.3
Dibenzofuran	ND		ug/l	2.0	0.66
2-Methylnaphthalene	ND		ug/l	2.0	0.72
1,2,4,5-Tetrachlorobenzene	ND		ug/l	10	0.67
Acetophenone	ND		ug/l	5.0	0.85
2,4,6-Trichlorophenol	ND		ug/l	5.0	0.68
p-Chloro-m-cresol	ND		ug/l	2.0	0.62
2-Chlorophenol	ND		ug/l	2.0	0.63
2,4-Dichlorophenol	ND		ug/l	5.0	0.77
2,4-Dimethylphenol	ND		ug/l	5.0	1.6
2-Nitrophenol	ND		ug/l	10	1.5

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/18/17 13:51
Analyst: CB

Extraction Method: EPA 3510C
Extraction Date: 12/17/17 11:26

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 09 Batch: WG1073669-1					
4-Nitrophenol	ND		ug/l	10	1.8
2,4-Dinitrophenol	ND		ug/l	20	5.5
4,6-Dinitro-o-cresol	ND		ug/l	10	2.1
Pentachlorophenol	ND		ug/l	10	3.4
Phenol	ND		ug/l	5.0	1.9
2-Methylphenol	ND		ug/l	5.0	1.0
3-Methylphenol/4-Methylphenol	ND		ug/l	3.0	1.1
2,4,5-Trichlorophenol	ND		ug/l	5.0	0.72
Benzoic Acid	ND		ug/l	50	13.
Benzyl Alcohol	ND		ug/l	2.0	0.72
Carbazole	ND		ug/l	2.0	0.63

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	37		21-120
Phenol-d6	26		10-120
Nitrobenzene-d5	59		23-120
2-Fluorobiphenyl	76		15-120
2,4,6-Tribromophenol	85		10-120
4-Terphenyl-d14	94		41-149

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/18/17 13:19
Analyst: MW

Extraction Method: EPA 3546
Extraction Date: 12/18/17 01:48

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-08,10 Batch: WG1073744-1					
Acenaphthene	ND		ug/kg	130	17.
1,2,4-Trichlorobenzene	ND		ug/kg	160	18.
Hexachlorobenzene	ND		ug/kg	98	18.
Bis(2-chloroethyl)ether	ND		ug/kg	150	22.
2-Chloronaphthalene	ND		ug/kg	160	16.
1,2-Dichlorobenzene	ND		ug/kg	160	29.
1,3-Dichlorobenzene	ND		ug/kg	160	28.
1,4-Dichlorobenzene	ND		ug/kg	160	28.
3,3'-Dichlorobenzidine	ND		ug/kg	160	43.
2,4-Dinitrotoluene	ND		ug/kg	160	32.
2,6-Dinitrotoluene	ND		ug/kg	160	28.
Fluoranthene	ND		ug/kg	98	19.
4-Chlorophenyl phenyl ether	ND		ug/kg	160	17.
4-Bromophenyl phenyl ether	ND		ug/kg	160	25.
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	28.
Bis(2-chloroethoxy)methane	ND		ug/kg	180	16.
Hexachlorobutadiene	ND		ug/kg	160	24.
Hexachlorocyclopentadiene	ND		ug/kg	460	150
Hexachloroethane	ND		ug/kg	130	26.
Isophorone	ND		ug/kg	150	21.
Naphthalene	ND		ug/kg	160	20.
Nitrobenzene	ND		ug/kg	150	24.
NDPA/DPA	ND		ug/kg	130	18.
n-Nitrosodi-n-propylamine	ND		ug/kg	160	25.
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	56.
Butyl benzyl phthalate	ND		ug/kg	160	41.
Di-n-butylphthalate	ND		ug/kg	160	31.
Di-n-octylphthalate	ND		ug/kg	160	55.
Diethyl phthalate	ND		ug/kg	160	15.

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/18/17 13:19
Analyst: MW

Extraction Method: EPA 3546
Extraction Date: 12/18/17 01:48

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-08,10 Batch: WG1073744-1					
Dimethyl phthalate	ND		ug/kg	160	34.
Benzo(a)anthracene	ND		ug/kg	98	18.
Benzo(a)pyrene	ND		ug/kg	130	40.
Benzo(b)fluoranthene	ND		ug/kg	98	27.
Benzo(k)fluoranthene	ND		ug/kg	98	26.
Chrysene	ND		ug/kg	98	17.
Acenaphthylene	ND		ug/kg	130	25.
Anthracene	ND		ug/kg	98	32.
Benzo(ghi)perylene	ND		ug/kg	130	19.
Fluorene	ND		ug/kg	160	16.
Phenanthrene	ND		ug/kg	98	20.
Dibenzo(a,h)anthracene	ND		ug/kg	98	19.
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	23.
Pyrene	ND		ug/kg	98	16.
Biphenyl	ND		ug/kg	370	38.
4-Chloroaniline	ND		ug/kg	160	30.
2-Nitroaniline	ND		ug/kg	160	31.
3-Nitroaniline	ND		ug/kg	160	31.
4-Nitroaniline	ND		ug/kg	160	67.
Dibenzofuran	ND		ug/kg	160	15.
2-Methylnaphthalene	ND		ug/kg	200	20.
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	160	17.
Acetophenone	ND		ug/kg	160	20.
2,4,6-Trichlorophenol	ND		ug/kg	98	31.
p-Chloro-m-cresol	ND		ug/kg	160	24.
2-Chlorophenol	ND		ug/kg	160	19.
2,4-Dichlorophenol	ND		ug/kg	150	26.
2,4-Dimethylphenol	ND		ug/kg	160	54.
2-Nitrophenol	ND		ug/kg	350	61.

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/18/17 13:19
Analyst: MW

Extraction Method: EPA 3546
Extraction Date: 12/18/17 01:48

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-08,10 Batch: WG1073744-1					
4-Nitrophenol	ND		ug/kg	230	66.
2,4-Dinitrophenol	ND		ug/kg	780	76.
4,6-Dinitro-o-cresol	ND		ug/kg	420	78.
Pentachlorophenol	ND		ug/kg	130	36.
Phenol	ND		ug/kg	160	24.
2-Methylphenol	ND		ug/kg	160	25.
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	25.
2,4,5-Trichlorophenol	ND		ug/kg	160	31.
Benzoic Acid	ND		ug/kg	530	160
Benzyl Alcohol	ND		ug/kg	160	50.
Carbazole	ND		ug/kg	160	16.
Tentatively Identified Compounds					
No Tentatively Identified Compounds	ND		ug/kg		

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	82		25-120
Phenol-d6	82		10-120
Nitrobenzene-d5	80		23-120
2-Fluorobiphenyl	99		30-120
2,4,6-Tribromophenol	114		10-136
4-Terphenyl-d14	102		18-120

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09 Batch: WG1073669-2 WG1073669-3								
Acenaphthene	82		83		37-111	1		30
1,2,4-Trichlorobenzene	76		80		39-98	5		30
Hexachlorobenzene	91		90		40-140	1		30
Bis(2-chloroethyl)ether	77		80		40-140	4		30
2-Chloronaphthalene	85		88		40-140	3		30
1,2-Dichlorobenzene	70		74		40-140	6		30
1,3-Dichlorobenzene	70		73		40-140	4		30
1,4-Dichlorobenzene	70		73		36-97	4		30
3,3'-Dichlorobenzidine	50		59		40-140	17		30
2,4-Dinitrotoluene	94		94		48-143	0		30
2,6-Dinitrotoluene	99		96		40-140	3		30
Fluoranthene	94		92		40-140	2		30
4-Chlorophenyl phenyl ether	88		88		40-140	0		30
4-Bromophenyl phenyl ether	91		92		40-140	1		30
Bis(2-chloroisopropyl)ether	86		89		40-140	3		30
Bis(2-chloroethoxy)methane	81		85		40-140	5		30
Hexachlorobutadiene	74		75		40-140	1		30
Hexachlorocyclopentadiene	82		86		40-140	5		30
Hexachloroethane	65		67		40-140	3		30
Isophorone	83		86		40-140	4		30
Naphthalene	77		78		40-140	1		30
Nitrobenzene	76		80		40-140	5		30
NDPA/DPA	90		89		40-140	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09 Batch: WG1073669-2 WG1073669-3								
n-Nitrosodi-n-propylamine	80		82		29-132	2		30
Bis(2-ethylhexyl)phthalate	85		84		40-140	1		30
Butyl benzyl phthalate	93		91		40-140	2		30
Di-n-butylphthalate	88		86		40-140	2		30
Di-n-octylphthalate	86		85		40-140	1		30
Diethyl phthalate	89		89		40-140	0		30
Dimethyl phthalate	96		94		40-140	2		30
Benzo(a)anthracene	86		85		40-140	1		30
Benzo(a)pyrene	89		88		40-140	1		30
Benzo(b)fluoranthene	87		88		40-140	1		30
Benzo(k)fluoranthene	91		87		40-140	4		30
Chrysene	87		87		40-140	0		30
Acenaphthylene	89		90		45-123	1		30
Anthracene	88		88		40-140	0		30
Benzo(ghi)perylene	88		87		40-140	1		30
Fluorene	88		87		40-140	1		30
Phenanthrene	86		86		40-140	0		30
Dibenzo(a,h)anthracene	88		87		40-140	1		30
Indeno(1,2,3-cd)pyrene	90		85		40-140	6		30
Pyrene	92		91		26-127	1		30
Biphenyl	91		93		40-140	2		30
4-Chloroaniline	**32**	Q	42		40-140	27		30
2-Nitroaniline	94		96		52-143	2		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09 Batch: WG1073669-2 WG1073669-3								
3-Nitroaniline	53		61		25-145	14		30
4-Nitroaniline	93		90		51-143	3		30
Dibenzofuran	84		85		40-140	1		30
2-Methylnaphthalene	82		84		40-140	2		30
1,2,4,5-Tetrachlorobenzene	88		90		2-134	2		30
Acetophenone	83		85		39-129	2		30
2,4,6-Trichlorophenol	99		99		30-130	0		30
p-Chloro-m-cresol	90		91		23-97	1		30
2-Chlorophenol	76		79		27-123	4		30
2,4-Dichlorophenol	88		92		30-130	4		30
2,4-Dimethylphenol	85		86		30-130	1		30
2-Nitrophenol	84		88		30-130	5		30
4-Nitrophenol	67		65		10-80	3		30
2,4-Dinitrophenol	68		70		20-130	3		30
4,6-Dinitro-o-cresol	91		90		20-164	1		30
Pentachlorophenol	**107**	Q	**106**	Q	9-103	1		30
Phenol	39		42		12-110	7		30
2-Methylphenol	72		75		30-130	4		30
3-Methylphenol/4-Methylphenol	70		72		30-130	3		30
2,4,5-Trichlorophenol	102		102		30-130	0		30
Benzoic Acid	48		48		10-164	0		30
Benzyl Alcohol	73		75		26-116	3		30
Carbazole	90		89		55-144	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 09 Batch: WG1073669-2 WG1073669-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	57		56		21-120
Phenol-d6	40		41		10-120
Nitrobenzene-d5	81		82		23-120
2-Fluorobiphenyl	93		94		15-120
2,4,6-Tribromophenol	104		101		10-120
4-Terphenyl-d14	99		96		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 Batch: WG1073744-2 WG1073744-3								
Acenaphthene	82		88		31-137	7		50
1,2,4-Trichlorobenzene	86		93		38-107	8		50
Hexachlorobenzene	103		112		40-140	8		50
Bis(2-chloroethyl)ether	71		76		40-140	7		50
2-Chloronaphthalene	91		99		40-140	8		50
1,2-Dichlorobenzene	79		82		40-140	4		50
1,3-Dichlorobenzene	77		82		40-140	6		50
1,4-Dichlorobenzene	77		84		28-104	9		50
3,3'-Dichlorobenzidine	60		71		40-140	17		50
2,4-Dinitrotoluene	93		100		40-132	7		50
2,6-Dinitrotoluene	100		108		40-140	8		50
Fluoranthene	93		99		40-140	6		50
4-Chlorophenyl phenyl ether	90		101		40-140	12		50
4-Bromophenyl phenyl ether	99		105		40-140	6		50
Bis(2-chloroisopropyl)ether	57		62		40-140	8		50
Bis(2-chloroethoxy)methane	72		79		40-117	9		50
Hexachlorobutadiene	97		101		40-140	4		50
Hexachlorocyclopentadiene	104		113		40-140	8		50
Hexachloroethane	74		80		40-140	8		50
Isophorone	76		84		40-140	10		50
Naphthalene	81		87		40-140	7		50
Nitrobenzene	77		82		40-140	6		50
NDPA/DPA	91		96		36-157	5		50

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 Batch: WG1073744-2 WG1073744-3								
n-Nitrosodi-n-propylamine	78		84		32-121	7		50
Bis(2-ethylhexyl)phthalate	86		93		40-140	8		50
Butyl benzyl phthalate	93		102		40-140	9		50
Di-n-butylphthalate	90		97		40-140	7		50
Di-n-octylphthalate	89		96		40-140	8		50
Diethyl phthalate	89		96		40-140	8		50
Dimethyl phthalate	99		107		40-140	8		50
Benzo(a)anthracene	86		94		40-140	9		50
Benzo(a)pyrene	97		103		40-140	6		50
Benzo(b)fluoranthene	97		104		40-140	7		50
Benzo(k)fluoranthene	90		97		40-140	7		50
Chrysene	83		89		40-140	7		50
Acenaphthylene	94		100		40-140	6		50
Anthracene	86		92		40-140	7		50
Benzo(ghi)perylene	95		101		40-140	6		50
Fluorene	89		95		40-140	7		50
Phenanthrene	82		88		40-140	7		50
Dibenzo(a,h)anthracene	94		101		40-140	7		50
Indeno(1,2,3-cd)pyrene	96		103		40-140	7		50
Pyrene	90		96		35-142	6		50
Biphenyl	97		103		54-104	6		50
4-Chloroaniline	44		51		40-140	15		50
2-Nitroaniline	96		105		47-134	9		50

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 Batch: WG1073744-2 WG1073744-3								
3-Nitroaniline	63		73		26-129	15		50
4-Nitroaniline	80		87		41-125	8		50
Dibenzofuran	84		93		40-140	10		50
2-Methylnaphthalene	86		93		40-140	8		50
1,2,4,5-Tetrachlorobenzene	99		107		40-117	8		50
Acetophenone	86		91		14-144	6		50
2,4,6-Trichlorophenol	103		117		30-130	13		50
p-Chloro-m-cresol	98		**105**	Q	26-103	7		50
2-Chlorophenol	81		88		25-102	8		50
2,4-Dichlorophenol	94		100		30-130	6		50
2,4-Dimethylphenol	92		100		30-130	8		50
2-Nitrophenol	83		93		30-130	11		50
4-Nitrophenol	102		106		11-114	4		50
2,4-Dinitrophenol	21		13		4-130	47		50
4,6-Dinitro-o-cresol	82		80		10-130	2		50
Pentachlorophenol	82		87		17-109	6		50
Phenol	79		83		26-90	5		50
2-Methylphenol	81		89		30-130.	9		50
3-Methylphenol/4-Methylphenol	81		90		30-130	11		50
2,4,5-Trichlorophenol	106		112		30-130	6		50
Benzoic Acid	**0**	Q	**0**	Q	10-110	NC		50
Benzyl Alcohol	88		94		40-140	7		50
Carbazole	85		91		54-128	7		50

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 Batch: WG1073744-2 WG1073744-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	77		83		25-120
Phenol-d6	77		82		10-120
Nitrobenzene-d5	75		76		23-120
2-Fluorobiphenyl	87		92		30-120
2,4,6-Tribromophenol	101		110		10-136
4-Terphenyl-d14	88		94		18-120

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 QC Batch ID: WG1073744-4 WG1073744-5 QC Sample: L1745804-04 Client ID: SB002 (7-9)												
Acenaphthene	ND	1490	1100	74		1200	81		31-137	9		50
1,2,4-Trichlorobenzene	ND	1490	1100	74		1100	74		38-107	0		50
Hexachlorobenzene	ND	1490	1200	81		1300	87		40-140	8		50
Bis(2-chloroethyl)ether	ND	1490	1100	74		1100	74		40-140	0		50
2-Chloronaphthalene	ND	1490	1100	74		1200	81		40-140	9		50
1,2-Dichlorobenzene	ND	1490	1100	74		1100	74		40-140	0		50
1,3-Dichlorobenzene	ND	1490	1100	74		1100	74		40-140	0		50
1,4-Dichlorobenzene	ND	1490	1100	74		1100	74		28-104	0		50
3,3'-Dichlorobenzidine	ND	1490	890	60		940	63		40-140	5		50
2,4-Dinitrotoluene	ND	1490	1100	74		1200	81		40-132	9		50
2,6-Dinitrotoluene	ND	1490	1200	81		1200	81		40-140	0		50
Fluoranthene	ND	1490	1200	81		1300	87		40-140	8		50
4-Chlorophenyl phenyl ether	ND	1490	1200	81		1200	81		40-140	0		50
4-Bromophenyl phenyl ether	ND	1490	1200	81		1200	81		40-140	0		50
Bis(2-chloroisopropyl)ether	ND	1490	1200	81		1200	81		40-140	0		50
Bis(2-chloroethoxy)methane	ND	1490	1100	74		1200	81		40-117	9		50
Hexachlorobutadiene	ND	1490	1100	74		1100	74		40-140	0		50
Hexachlorocyclopentadiene	ND	1490	670	45		750	50		40-140	11		50
Hexachloroethane	ND	1490	900	60		930	63		40-140	3		50
Isophorone	ND	1490	1100	74		1200	81		40-140	9		50
Naphthalene	ND	1490	1100	74		1200	81		40-140	9		50
Nitrobenzene	ND	1490	1100	74		1100	74		40-140	0		50
NDPA/DPA	ND	1490	1100	74		1200	81		36-157	9		50

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 QC Batch ID: WG1073744-4 WG1073744-5 QC Sample: L1745804-04 Client ID: SB002 (7-9)												
n-Nitrosodi-n-propylamine	ND	1490	1100	74		1100	74		32-121	0		50
Bis(2-ethylhexyl)phthalate	ND	1490	1100	74		1200	81		40-140	9		50
Butyl benzyl phthalate	ND	1490	1200	81		1300	87		40-140	8		50
Di-n-butylphthalate	ND	1490	1100	74		1200	81		40-140	9		50
Di-n-octylphthalate	ND	1490	1200	81		1200	81		40-140	0		50
Diethyl phthalate	ND	1490	1100	74		1200	81		40-140	9		50
Dimethyl phthalate	ND	1490	1200	81		1200	81		40-140	0		50
Benzo(a)anthracene	ND	1490	1100	74		1200	81		40-140	9		50
Benzo(a)pyrene	ND	1490	1200	81		1200	81		40-140	0		50
Benzo(b)fluoranthene	ND	1490	1100	74		1200	81		40-140	9		50
Benzo(k)fluoranthene	ND	1490	1200	81		1200	81		40-140	0		50
Chrysene	ND	1490	1100	74		1200	81		40-140	9		50
Acenaphthylene	ND	1490	1200	81		1300	87		40-140	8		50
Anthracene	ND	1490	1100	74		1200	81		40-140	9		50
Benzo(ghi)perylene	ND	1490	1100	74		1200	81		40-140	9		50
Fluorene	ND	1490	1200	81		1200	81		40-140	0		50
Phenanthrene	ND	1490	1100	74		1200	81		40-140	9		50
Dibenzo(a,h)anthracene	ND	1490	1100	74		1200	81		40-140	9		50
Indeno(1,2,3-cd)pyrene	ND	1490	1200	81		1200	81		40-140	0		50
Pyrene	ND	1490	1100	74		1200	81		35-142	9		50
Biphenyl	ND	1490	1200	81		1300	87		54-104	8		50
4-Chloroaniline	ND	1490	780	52		850	57		40-140	9		50
2-Nitroaniline	ND	1490	1200	81		1300	87		47-134	8		50

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 QC Batch ID: WG1073744-4 WG1073744-5 QC Sample: L1745804-04 Client ID: SB002 (7-9)												
3-Nitroaniline	ND	1490	1200	81		1200	81		26-129	0		50
4-Nitroaniline	ND	1490	1300	87		1300	87		41-125	0		50
Dibenzofuran	ND	1490	1100	74		1200	81		40-140	9		50
2-Methylnaphthalene	ND	1490	1100	74		1200	81		40-140	9		50
1,2,4,5-Tetrachlorobenzene	ND	1490	1200	81		1300	87		40-117	8		50
Acetophenone	ND	1490	1200	81		1200	81		14-144	0		50
2,4,6-Trichlorophenol	ND	1490	1200	81		1300	87		30-130	8		50
p-Chloro-m-cresol	ND	1490	1100	74		1200	81		26-103	9		50
2-Chlorophenol	ND	1490	1100	74		1100	74		25-102	0		50
2,4-Dichlorophenol	ND	1490	1100	74		1200	81		30-130	9		50
2,4-Dimethylphenol	ND	1490	990	66		1100	74		30-130	11		50
2-Nitrophenol	ND	1490	1000	67		1100	74		30-130	10		50
4-Nitrophenol	ND	1490	1300	87		1400	94		11-114	7		50
2,4-Dinitrophenol	ND	1490	210J	14		240J	16		4-130	13		50
4,6-Dinitro-o-cresol	ND	1490	390J	26		430J	29		10-130	10		50
Pentachlorophenol	ND	1490	1500	100		1600	**110**	Q	17-109	6		50
Phenol	ND	1490	1100	74		1100	74		26-90	0		50
2-Methylphenol	ND	1490	1000	67		1100	74		30-130.	10		50
3-Methylphenol/4-Methylphenol	ND	1490	1000	67		1100	74		30-130	10		50
2,4,5-Trichlorophenol	ND	1490	1300	87		1400	94		30-130	7		50
Benzoic Acid	ND	1490	ND	**0**	Q	ND	**0**	Q	10-110	NC		50
Benzyl Alcohol	ND	1490	1100	74		1200	81		40-140	9		50
Carbazole	ND	1490	1100	74		1200	81		54-128	9		50

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1745804

Project Number: BBU1702 ***Report Date:*** 12/21/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*

Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-08,10 QC Batch ID: WG1073744-4 WG1073744-5 QC Sample: L1745804-04 Client ID: SB002 (7-9)

Surrogate	*MS % Recovery*	*MS Qualifier*	*MSD % Recovery*	*MSD Qualifier*	*Acceptance Criteria*
2,4,6-Tribromophenol	80		85		10-136
2-Fluorobiphenyl	76		84		30-120
2-Fluorophenol	74		75		25-120
4-Terphenyl-d14	74		77		18-120
Nitrobenzene-d5	74		73		23-120
Phenol-d6	75		76		10-120

PCBS

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01
Client ID: SB001 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 03:37
Analyst: WR
Percent Solids: 94%

Date Collected: 12/11/17 09:00
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.4	4.02	1	A
Aroclor 1221	ND		ug/kg	35.4	5.39	1	A
Aroclor 1232	ND		ug/kg	35.4	3.48	1	A
Aroclor 1242	ND		ug/kg	35.4	4.33	1	A
Aroclor 1248	ND		ug/kg	35.4	3.97	1	A
Aroclor 1254	ND		ug/kg	35.4	2.89	1	A
Aroclor 1260	ND		ug/kg	35.4	3.70	1	A
Aroclor 1262	ND		ug/kg	35.4	2.91	1	A
Aroclor 1268	ND		ug/kg	35.4	2.51	1	A
PCBs, Total	ND		ug/kg	35.4	2.51	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	54		30-150	A
Decachlorobiphenyl	59		30-150	A
2,4,5,6-Tetrachloro-m-xylene	58		30-150	B
Decachlorobiphenyl	58		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02
Client ID: SB001 (8-10)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 03:51
Analyst: WR
Percent Solids: 87%

Date Collected: 12/11/17 09:15
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.5	4.25	1	A
Aroclor 1221	ND		ug/kg	37.5	5.70	1	A
Aroclor 1232	ND		ug/kg	37.5	3.69	1	A
Aroclor 1242	ND		ug/kg	37.5	4.58	1	A
Aroclor 1248	ND		ug/kg	37.5	4.20	1	A
Aroclor 1254	ND		ug/kg	37.5	3.06	1	A
Aroclor 1260	ND		ug/kg	37.5	3.91	1	A
Aroclor 1262	ND		ug/kg	37.5	3.08	1	A
Aroclor 1268	ND		ug/kg	37.5	2.65	1	A
PCBs, Total	ND		ug/kg	37.5	2.65	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		30-150	A
Decachlorobiphenyl	67		30-150	A
2,4,5,6-Tetrachloro-m-xylene	70		30-150	B
Decachlorobiphenyl	65		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03
Client ID: SB002 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 04:05
Analyst: WR
Percent Solids: 85%

Date Collected: 12/11/17 09:40
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.5	4.25	1	A
Aroclor 1221	ND		ug/kg	37.5	5.70	1	A
Aroclor 1232	ND		ug/kg	37.5	3.69	1	A
Aroclor 1242	ND		ug/kg	37.5	4.59	1	A
Aroclor 1248	ND		ug/kg	37.5	4.20	1	A
Aroclor 1254	ND		ug/kg	37.5	3.06	1	A
Aroclor 1260	ND		ug/kg	37.5	3.91	1	A
Aroclor 1262	ND		ug/kg	37.5	3.08	1	A
Aroclor 1268	ND		ug/kg	37.5	2.65	1	A
PCBs, Total	ND		ug/kg	37.5	2.65	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	57		30-150	A
Decachlorobiphenyl	50		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	61		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04
Client ID: SB002 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 02:56
Analyst: WR
Percent Solids: 89%

Date Collected: 12/11/17 09:50
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.7	4.17	1	A
Aroclor 1221	ND		ug/kg	36.7	5.59	1	A
Aroclor 1232	ND		ug/kg	36.7	3.62	1	A
Aroclor 1242	ND		ug/kg	36.7	4.50	1	A
Aroclor 1248	ND		ug/kg	36.7	4.12	1	A
Aroclor 1254	ND		ug/kg	36.7	3.00	1	A
Aroclor 1260	ND		ug/kg	36.7	3.84	1	A
Aroclor 1262	ND		ug/kg	36.7	3.02	1	A
Aroclor 1268	ND		ug/kg	36.7	2.60	1	A
PCBs, Total	ND		ug/kg	36.7	2.60	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	A
Decachlorobiphenyl	59		30-150	A
2,4,5,6-Tetrachloro-m-xylene	71		30-150	B
Decachlorobiphenyl	64		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05
Client ID: SB003 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 04:19
Analyst: WR
Percent Solids: 86%

Date Collected: 12/11/17 12:15
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.8	4.29	1	A
Aroclor 1221	ND		ug/kg	37.8	5.76	1	A
Aroclor 1232	ND		ug/kg	37.8	3.72	1	A
Aroclor 1242	50.8		ug/kg	37.8	4.63	1	A
Aroclor 1248	ND		ug/kg	37.8	4.25	1	A
Aroclor 1254	13.1	J	ug/kg	37.8	3.09	1	B
Aroclor 1260	ND		ug/kg	37.8	3.95	1	A
Aroclor 1262	ND		ug/kg	37.8	3.11	1	A
Aroclor 1268	ND		ug/kg	37.8	2.68	1	A
PCBs, Total	63.9	J	ug/kg	37.8	2.68	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	71		30-150	A
Decachlorobiphenyl	72		30-150	A
2,4,5,6-Tetrachloro-m-xylene	66		30-150	B
Decachlorobiphenyl	88		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06
Client ID: SB003 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 04:33
Analyst: WR
Percent Solids: 87%

Date Collected: 12/11/17 12:25
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	74.7	8.47	1	A
Aroclor 1221	ND		ug/kg	74.7	11.4	1	A
Aroclor 1232	ND		ug/kg	74.7	7.35	1	A
Aroclor 1242	ND		ug/kg	74.7	9.14	1	A
Aroclor 1248	ND		ug/kg	74.7	8.38	1	A
Aroclor 1254	ND		ug/kg	74.7	6.09	1	A
Aroclor 1260	ND		ug/kg	74.7	7.79	1	A
Aroclor 1262	ND		ug/kg	74.7	6.14	1	A
Aroclor 1268	ND		ug/kg	74.7	5.28	1	A
PCBs, Total	ND		ug/kg	74.7	5.28	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		30-150	A
Decachlorobiphenyl	54		30-150	A
2,4,5,6-Tetrachloro-m-xylene	65		30-150	B
Decachlorobiphenyl	69		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07
Client ID: SB004 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 04:47
Analyst: WR
Percent Solids: 88%

Date Collected: 12/11/17 12:40
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.4	4.12	1	A
Aroclor 1221	ND		ug/kg	36.4	5.54	1	A
Aroclor 1232	ND		ug/kg	36.4	3.58	1	A
Aroclor 1242	ND		ug/kg	36.4	4.45	1	A
Aroclor 1248	ND		ug/kg	36.4	4.08	1	A
Aroclor 1254	ND		ug/kg	36.4	2.97	1	A
Aroclor 1260	ND		ug/kg	36.4	3.80	1	A
Aroclor 1262	ND		ug/kg	36.4	2.99	1	A
Aroclor 1268	ND		ug/kg	36.4	2.57	1	A
PCBs, Total	ND		ug/kg	36.4	2.57	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	61		30-150	A
Decachlorobiphenyl	44		30-150	A
2,4,5,6-Tetrachloro-m-xylene	60		30-150	B
Decachlorobiphenyl	59		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08
Client ID: SB004 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 05:01
Analyst: WR
Percent Solids: 86%

Date Collected: 12/11/17 12:50
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	38.0	4.30	1	A
Aroclor 1221	ND		ug/kg	38.0	5.78	1	A
Aroclor 1232	ND		ug/kg	38.0	3.74	1	A
Aroclor 1242	ND		ug/kg	38.0	4.65	1	A
Aroclor 1248	ND		ug/kg	38.0	4.26	1	A
Aroclor 1254	ND		ug/kg	38.0	3.10	1	A
Aroclor 1260	ND		ug/kg	38.0	3.96	1	A
Aroclor 1262	ND		ug/kg	38.0	3.12	1	A
Aroclor 1268	ND		ug/kg	38.0	2.69	1	A
PCBs, Total	ND		ug/kg	38.0	2.69	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	69		30-150	A
Decachlorobiphenyl	98		30-150	A
2,4,5,6-Tetrachloro-m-xylene	67		30-150	B
Decachlorobiphenyl	129		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09
Client ID: FIELD BLANK 001
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Water
Analytical Method: 1,8082A
Analytical Date: 12/18/17 03:51
Analyst: WR

Date Collected: 12/11/17 10:30
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 12/17/17 13:42
Cleanup Method: EPA 3665A
Cleanup Date: 12/17/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/17/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.083	0.020	1	A
Aroclor 1221	ND		ug/l	0.083	0.032	1	A
Aroclor 1232	ND		ug/l	0.083	0.027	1	A
Aroclor 1242	ND		ug/l	0.083	0.030	1	A
Aroclor 1248	ND		ug/l	0.083	0.023	1	A
Aroclor 1254	ND		ug/l	0.083	0.035	1	A
Aroclor 1260	ND		ug/l	0.083	0.020	1	A
Aroclor 1262	ND		ug/l	0.083	0.017	1	A
Aroclor 1268	ND		ug/l	0.083	0.027	1	A
PCBs, Total	ND		ug/l	0.083	0.017	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	73		30-150	A
Decachlorobiphenyl	78		30-150	A
2,4,5,6-Tetrachloro-m-xylene	70		30-150	B
Decachlorobiphenyl	79		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10
Client ID: DUP001
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/20/17 05:15
Analyst: WR
Percent Solids: 90%

Date Collected: 12/11/17 00:00
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.4	4.13	1	A
Aroclor 1221	ND		ug/kg	36.4	5.54	1	A
Aroclor 1232	ND		ug/kg	36.4	3.58	1	A
Aroclor 1242	ND		ug/kg	36.4	4.46	1	A
Aroclor 1248	ND		ug/kg	36.4	4.09	1	A
Aroclor 1254	ND		ug/kg	36.4	2.97	1	A
Aroclor 1260	ND		ug/kg	36.4	3.80	1	A
Aroclor 1262	ND		ug/kg	36.4	2.99	1	A
Aroclor 1268	ND		ug/kg	36.4	2.58	1	A
PCBs, Total	ND		ug/kg	36.4	2.58	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		30-150	A
Decachlorobiphenyl	39		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	52		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 12/18/17 03:14
Analyst: WR

Extraction Method: EPA 3510C
Extraction Date: 12/17/17 13:42
Cleanup Method: EPA 3665A
Cleanup Date: 12/17/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/17/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 09 Batch: WG1073695-1						
Aroclor 1016	ND		ug/l	0.083	0.020	A
Aroclor 1221	ND		ug/l	0.083	0.032	A
Aroclor 1232	ND		ug/l	0.083	0.027	A
Aroclor 1242	ND		ug/l	0.083	0.030	A
Aroclor 1248	ND		ug/l	0.083	0.023	A
Aroclor 1254	ND		ug/l	0.083	0.035	A
Aroclor 1260	ND		ug/l	0.083	0.020	A
Aroclor 1262	ND		ug/l	0.083	0.017	A
Aroclor 1268	ND		ug/l	0.083	0.027	A
PCBs, Total	ND		ug/l	0.083	0.017	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	72		30-150	A
Decachlorobiphenyl	89		30-150	A
2,4,5,6-Tetrachloro-m-xylene	67		30-150	B
Decachlorobiphenyl	73		30-150	B

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 12/20/17 05:28
Analyst: WR

Extraction Method: EPA 3546
Extraction Date: 12/18/17 23:43
Cleanup Method: EPA 3665A
Cleanup Date: 12/19/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-08,10 Batch: WG1074155-1						
Aroclor 1016	ND		ug/kg	33.1	3.75	A
Aroclor 1221	ND		ug/kg	33.1	5.04	A
Aroclor 1232	ND		ug/kg	33.1	3.26	A
Aroclor 1242	ND		ug/kg	33.1	4.05	A
Aroclor 1248	ND		ug/kg	33.1	3.72	A
Aroclor 1254	ND		ug/kg	33.1	2.70	A
Aroclor 1260	ND		ug/kg	33.1	3.46	A
Aroclor 1262	ND		ug/kg	33.1	2.72	A
Aroclor 1268	ND		ug/kg	33.1	2.34	A
PCBs, Total	ND		ug/kg	33.1	2.34	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	68		30-150	A
Decachlorobiphenyl	55		30-150	A
2,4,5,6-Tetrachloro-m-xylene	73		30-150	B
Decachlorobiphenyl	62		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 09 Batch: WG1073695-2 WG1073695-3									
Aroclor 1016	76		75		40-140	1		50	A
Aroclor 1260	90		86		40-140	4		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	86		77		30-150	A
Decachlorobiphenyl	102		98		30-150	A
2,4,5,6-Tetrachloro-m-xylene	82		72		30-150	B
Decachlorobiphenyl	84		79		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-08,10 Batch: WG1074155-2 WG1074155-3									
Aroclor 1016	66		70		40-140	6		50	A
Aroclor 1260	61		67		40-140	9		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		70		30-150	A
Decachlorobiphenyl	58		62		30-150	A
2,4,5,6-Tetrachloro-m-xylene	71		74		30-150	B
Decachlorobiphenyl	64		68		30-150	B

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702
Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-08,10 QC Batch ID: WG1074155-4 WG1074155-5 QC Sample: L1745804-04 Client ID: SB002 (7-9)													
Aroclor 1016	ND	232	144	62		156	69		40-140	8		50	A
Aroclor 1260	ND	232	134	58		159	70		40-140	17		50	A

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	64		69		30-150	A
Decachlorobiphenyl	56		69		30-150	A
2,4,5,6-Tetrachloro-m-xylene	68		74		30-150	B
Decachlorobiphenyl	64		69		30-150	B

PESTICIDES

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01
Client ID: SB001 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 07:58
Analyst: JW
Percent Solids: 94%

Date Collected: 12/11/17 09:00
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	0.372	J	ug/kg	1.62	0.318	1	B
Lindane	ND		ug/kg	0.677	0.303	1	A
Alpha-BHC	ND		ug/kg	0.677	0.192	1	A
Beta-BHC	ND		ug/kg	1.62	0.616	1	A
Heptachlor	ND		ug/kg	0.813	0.364	1	A
Aldrin	ND		ug/kg	1.62	0.572	1	A
Heptachlor epoxide	ND		ug/kg	3.05	0.914	1	A
Endrin	ND		ug/kg	0.677	0.278	1	A
Endrin aldehyde	ND		ug/kg	2.03	0.711	1	A
Endrin ketone	ND		ug/kg	1.62	0.418	1	A
Dieldrin	ND		ug/kg	1.02	0.508	1	A
4,4'-DDE	ND		ug/kg	1.62	0.376	1	A
4,4'-DDD	ND		ug/kg	1.62	0.580	1	A
4,4'-DDT	ND		ug/kg	3.05	1.31	1	A
Endosulfan I	ND		ug/kg	1.62	0.384	1	A
Endosulfan II	ND		ug/kg	1.62	0.543	1	A
Endosulfan sulfate	ND		ug/kg	0.677	0.322	1	A
Methoxychlor	ND		ug/kg	3.05	0.948	1	A
Toxaphene	ND		ug/kg	30.5	8.53	1	A
cis-Chlordane	ND		ug/kg	2.03	0.566	1	A
trans-Chlordane	ND		ug/kg	2.03	0.536	1	A
Chlordane	ND		ug/kg	13.2	5.38	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85		30-150	B
Decachlorobiphenyl	107		30-150	B
2,4,5,6-Tetrachloro-m-xylene	89		30-150	A
Decachlorobiphenyl	96		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02
Client ID: SB001 (8-10)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 08:11
Analyst: JW
Percent Solids: 87%

Date Collected: 12/11/17 09:15
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.81	0.355	1	A
Lindane	ND		ug/kg	0.756	0.338	1	A
Alpha-BHC	ND		ug/kg	0.756	0.215	1	A
Beta-BHC	ND		ug/kg	1.81	0.688	1	A
Heptachlor	ND		ug/kg	0.907	0.406	1	A
Aldrin	ND		ug/kg	1.81	0.638	1	A
Heptachlor epoxide	ND		ug/kg	3.40	1.02	1	A
Endrin	ND		ug/kg	0.756	0.310	1	A
Endrin aldehyde	ND		ug/kg	2.27	0.794	1	A
Endrin ketone	ND		ug/kg	1.81	0.467	1	A
Dieldrin	ND		ug/kg	1.13	0.567	1	A
4,4'-DDE	ND		ug/kg	1.81	0.419	1	A
4,4'-DDD	ND		ug/kg	1.81	0.647	1	A
4,4'-DDT	ND		ug/kg	3.40	1.46	1	A
Endosulfan I	ND		ug/kg	1.81	0.428	1	A
Endosulfan II	ND		ug/kg	1.81	0.606	1	A
Endosulfan sulfate	ND		ug/kg	0.756	0.360	1	A
Methoxychlor	ND		ug/kg	3.40	1.06	1	A
Toxaphene	ND		ug/kg	34.0	9.52	1	A
cis-Chlordane	ND		ug/kg	2.27	0.632	1	A
trans-Chlordane	ND		ug/kg	2.27	0.598	1	A
Chlordane	ND		ug/kg	14.7	6.01	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	99		30-150	B
Decachlorobiphenyl	118		30-150	B
2,4,5,6-Tetrachloro-m-xylene	101		30-150	A
Decachlorobiphenyl	94		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03
Client ID: SB002 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 08:36
Analyst: JW
Percent Solids: 85%

Date Collected: 12/11/17 09:40
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.88	0.368	1	A
Lindane	ND		ug/kg	0.782	0.350	1	A
Alpha-BHC	ND		ug/kg	0.782	0.222	1	A
Beta-BHC	ND		ug/kg	1.88	0.712	1	A
Heptachlor	ND		ug/kg	0.939	0.421	1	A
Aldrin	ND		ug/kg	1.88	0.661	1	A
Heptachlor epoxide	ND		ug/kg	3.52	1.06	1	A
Endrin	ND		ug/kg	0.782	0.321	1	A
Endrin aldehyde	ND		ug/kg	2.35	0.821	1	A
Endrin ketone	ND		ug/kg	1.88	0.483	1	A
Dieldrin	ND		ug/kg	1.17	0.587	1	A
4,4'-DDE	ND		ug/kg	1.88	0.434	1	A
4,4'-DDD	ND		ug/kg	1.88	0.670	1	A
4,4'-DDT	ND		ug/kg	3.52	1.51	1	A
Endosulfan I	ND		ug/kg	1.88	0.443	1	A
Endosulfan II	ND		ug/kg	1.88	0.627	1	A
Endosulfan sulfate	ND		ug/kg	0.782	0.372	1	A
Methoxychlor	ND		ug/kg	3.52	1.10	1	A
Toxaphene	ND		ug/kg	35.2	9.86	1	A
cis-Chlordane	ND		ug/kg	2.35	0.654	1	A
trans-Chlordane	ND		ug/kg	2.35	0.619	1	A
Chlordane	ND		ug/kg	15.2	6.22	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	88		30-150	B
Decachlorobiphenyl	100		30-150	B
2,4,5,6-Tetrachloro-m-xylene	87		30-150	A
Decachlorobiphenyl	88		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04
Client ID: SB002 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 07:46
Analyst: JW
Percent Solids: 89%

Date Collected: 12/11/17 09:50
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	0.986	J	ug/kg	1.74	0.342	1	B
Lindane	ND		ug/kg	0.727	0.325	1	A
Alpha-BHC	ND		ug/kg	0.727	0.206	1	A
Beta-BHC	ND		ug/kg	1.74	0.662	1	A
Heptachlor	ND		ug/kg	0.873	0.391	1	A
Aldrin	ND		ug/kg	1.74	0.615	1	A
Heptachlor epoxide	ND		ug/kg	3.27	0.982	1	A
Endrin	ND		ug/kg	0.727	0.298	1	A
Endrin aldehyde	ND		ug/kg	2.18	0.764	1	A
Endrin ketone	ND		ug/kg	1.74	0.450	1	A
Dieldrin	ND		ug/kg	1.09	0.546	1	A
4,4'-DDE	ND		ug/kg	1.74	0.404	1	A
4,4'-DDD	ND		ug/kg	1.74	0.623	1	A
4,4'-DDT	ND		ug/kg	3.27	1.40	1	A
Endosulfan I	ND		ug/kg	1.74	0.412	1	A
Endosulfan II	ND		ug/kg	1.74	0.583	1	A
Endosulfan sulfate	ND		ug/kg	0.727	0.346	1	A
Methoxychlor	ND		ug/kg	3.27	1.02	1	A
Toxaphene	ND		ug/kg	32.7	9.16	1	A
cis-Chlordane	ND		ug/kg	2.18	0.608	1	A
trans-Chlordane	ND		ug/kg	2.18	0.576	1	A
Chlordane	ND		ug/kg	14.2	5.78	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	86		30-150	B
Decachlorobiphenyl	105		30-150	B
2,4,5,6-Tetrachloro-m-xylene	86		30-150	A
Decachlorobiphenyl	79		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05
Client ID: SB003 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 14:14
Analyst: KEG
Percent Solids: 86%

Date Collected: 12/11/17 12:15
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.84	0.361	1	A
Lindane	ND		ug/kg	0.767	0.343	1	A
Alpha-BHC	ND		ug/kg	0.767	0.218	1	A
Beta-BHC	ND		ug/kg	1.84	0.698	1	A
Heptachlor	ND		ug/kg	0.921	0.413	1	A
Aldrin	ND		ug/kg	1.84	0.648	1	A
Heptachlor epoxide	ND		ug/kg	3.45	1.04	1	A
Endrin	0.818	PI	ug/kg	0.767	0.315	1	B
Endrin aldehyde	ND		ug/kg	2.30	0.806	1	A
Endrin ketone	ND		ug/kg	1.84	0.474	1	A
Dieldrin	ND	PI	ug/kg	1.15	0.576	1	A
4,4'-DDE	1.24	J	ug/kg	1.84	0.426	1	B
4,4'-DDD	ND		ug/kg	1.84	0.657	1	B
4,4'-DDT	ND	PI	ug/kg	3.45	1.48	1	B
Endosulfan I	ND		ug/kg	1.84	0.435	1	A
Endosulfan II	0.672	JPI	ug/kg	1.84	0.615	1	A
Endosulfan sulfate	ND		ug/kg	0.767	0.365	1	A
Methoxychlor	ND		ug/kg	3.45	1.07	1	A
Toxaphene	ND		ug/kg	34.5	9.67	1	A
cis-Chlordane	ND		ug/kg	2.30	0.642	1	A
trans-Chlordane	ND		ug/kg	2.30	0.608	1	A
Chlordane	ND		ug/kg	15.0	6.10	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	B
Decachlorobiphenyl	86		30-150	B
2,4,5,6-Tetrachloro-m-xylene	84		30-150	A
Decachlorobiphenyl	105		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06
Client ID: SB003 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 09:01
Analyst: JW
Percent Solids: 87%

Date Collected: 12/11/17 12:25
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	2.68	0.525	1	A
Lindane	ND		ug/kg	1.12	0.499	1	A
Alpha-BHC	ND		ug/kg	1.12	0.317	1	A
Beta-BHC	ND		ug/kg	2.68	1.02	1	A
Heptachlor	ND		ug/kg	1.34	0.601	1	A
Aldrin	ND		ug/kg	2.68	0.944	1	A
Heptachlor epoxide	ND		ug/kg	5.02	1.51	1	B
Endrin	ND		ug/kg	1.12	0.458	1	A
Endrin aldehyde	ND		ug/kg	3.35	1.17	1	A
Endrin ketone	ND		ug/kg	2.68	0.690	1	A
Dieldrin	3.42		ug/kg	1.67	0.837	1	B
4,4'-DDE	2.15	J	ug/kg	2.68	0.620	1	A
4,4'-DDD	1.40	J	ug/kg	2.68	0.956	1	B
4,4'-DDT	6.06	P	ug/kg	5.02	2.16	1	A
Endosulfan I	ND		ug/kg	2.68	0.633	1	A
Endosulfan II	ND		ug/kg	2.68	0.896	1	A
Endosulfan sulfate	ND		ug/kg	1.12	0.532	1	A
Methoxychlor	ND		ug/kg	5.02	1.56	1	A
Toxaphene	ND		ug/kg	50.2	14.1	1	A
cis-Chlordane	7.30	P	ug/kg	3.35	0.934	1	A
trans-Chlordane	3.32	JPI	ug/kg	3.35	0.884	1	B
Chlordane	45.0		ug/kg	21.8	8.88	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	94		30-150	B
Decachlorobiphenyl	111		30-150	B
2,4,5,6-Tetrachloro-m-xylene	100		30-150	A
Decachlorobiphenyl	101		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07
Client ID: SB004 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 09:13
Analyst: JW
Percent Solids: 88%

Date Collected: 12/11/17 12:40
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	0.542	J	ug/kg	1.79	0.351	1	B
Lindane	ND		ug/kg	0.746	0.333	1	A
Alpha-BHC	ND		ug/kg	0.746	0.212	1	A
Beta-BHC	ND		ug/kg	1.79	0.679	1	A
Heptachlor	ND		ug/kg	0.895	0.401	1	A
Aldrin	ND		ug/kg	1.79	0.630	1	A
Heptachlor epoxide	ND		ug/kg	3.36	1.01	1	A
Endrin	ND		ug/kg	0.746	0.306	1	A
Endrin aldehyde	ND		ug/kg	2.24	0.783	1	A
Endrin ketone	ND		ug/kg	1.79	0.461	1	A
Dieldrin	ND		ug/kg	1.12	0.560	1	A
4,4'-DDE	1.79		ug/kg	1.79	0.414	1	B
4,4'-DDD	0.665	J	ug/kg	1.79	0.639	1	A
4,4'-DDT	5.64		ug/kg	3.36	1.44	1	A
Endosulfan I	ND		ug/kg	1.79	0.423	1	A
Endosulfan II	ND		ug/kg	1.79	0.598	1	A
Endosulfan sulfate	ND		ug/kg	0.746	0.355	1	A
Methoxychlor	ND		ug/kg	3.36	1.04	1	A
Toxaphene	ND		ug/kg	33.6	9.40	1	A
cis-Chlordane	ND		ug/kg	2.24	0.624	1	A
trans-Chlordane	ND		ug/kg	2.24	0.591	1	A
Chlordane	ND		ug/kg	14.5	5.93	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	99		30-150	B
Decachlorobiphenyl	102		30-150	B
2,4,5,6-Tetrachloro-m-xylene	107		30-150	A
Decachlorobiphenyl	95		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08
Client ID: SB004 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 09:26
Analyst: JW
Percent Solids: 86%

Date Collected: 12/11/17 12:50
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	1.08	J	ug/kg	1.83	0.359	1	B
Lindane	ND		ug/kg	0.763	0.341	1	A
Alpha-BHC	ND		ug/kg	0.763	0.217	1	A
Beta-BHC	ND		ug/kg	1.83	0.695	1	A
Heptachlor	ND		ug/kg	0.916	0.411	1	A
Aldrin	ND		ug/kg	1.83	0.645	1	A
Heptachlor epoxide	ND		ug/kg	3.44	1.03	1	A
Endrin	ND		ug/kg	0.763	0.313	1	A
Endrin aldehyde	ND		ug/kg	2.29	0.802	1	A
Endrin ketone	ND		ug/kg	1.83	0.472	1	A
Dieldrin	2.69		ug/kg	1.14	0.572	1	B
4,4'-DDE	1.74	J	ug/kg	1.83	0.424	1	B
4,4'-DDD	1.81	J	ug/kg	1.83	0.653	1	B
4,4'-DDT	4.08		ug/kg	3.44	1.47	1	B
Endosulfan I	ND		ug/kg	1.83	0.433	1	A
Endosulfan II	ND		ug/kg	1.83	0.612	1	A
Endosulfan sulfate	ND		ug/kg	0.763	0.363	1	A
Methoxychlor	ND		ug/kg	3.44	1.07	1	A
Toxaphene	ND		ug/kg	34.4	9.62	1	A
cis-Chlordane	ND		ug/kg	2.29	0.638	1	A
trans-Chlordane	ND		ug/kg	2.29	0.604	1	A
Chlordane	ND		ug/kg	14.9	6.07	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	96		30-150	B
Decachlorobiphenyl	**181**	Q	30-150	B
2,4,5,6-Tetrachloro-m-xylene	114		30-150	A
Decachlorobiphenyl	124		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09
Client ID: FIELD BLANK 001
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 12/20/17 07:09
Analyst: JW

Date Collected: 12/11/17 10:30
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 12/16/17 20:12

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.020	0.005	1	A
Lindane	ND		ug/l	0.020	0.004	1	A
Alpha-BHC	ND		ug/l	0.020	0.004	1	A
Beta-BHC	ND		ug/l	0.020	0.006	1	A
Heptachlor	ND		ug/l	0.020	0.003	1	A
Aldrin	ND		ug/l	0.020	0.002	1	A
Heptachlor epoxide	ND		ug/l	0.020	0.004	1	A
Endrin	ND		ug/l	0.040	0.004	1	A
Endrin aldehyde	ND		ug/l	0.040	0.008	1	A
Endrin ketone	ND		ug/l	0.040	0.005	1	A
Dieldrin	ND		ug/l	0.040	0.004	1	A
4,4'-DDE	ND		ug/l	0.040	0.004	1	A
4,4'-DDD	ND		ug/l	0.040	0.005	1	A
4,4'-DDT	ND		ug/l	0.040	0.004	1	A
Endosulfan I	ND		ug/l	0.020	0.003	1	A
Endosulfan II	ND		ug/l	0.040	0.005	1	A
Endosulfan sulfate	ND		ug/l	0.040	0.005	1	A
Methoxychlor	ND		ug/l	0.200	0.007	1	A
Toxaphene	ND		ug/l	0.200	0.063	1	A
cis-Chlordane	ND		ug/l	0.020	0.007	1	A
trans-Chlordane	ND		ug/l	0.020	0.006	1	A
Chlordane	ND		ug/l	0.200	0.046	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	84		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		30-150	B
Decachlorobiphenyl	86		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10
Client ID: DUP001
Sample Location: 718 E. 212TH ST., BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/20/17 14:26
Analyst: KEG
Percent Solids: 90%

Date Collected: 12/11/17 00:00
Date Received: 12/12/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.74	0.340	1	A
Lindane	ND		ug/kg	0.723	0.323	1	A
Alpha-BHC	ND		ug/kg	0.723	0.205	1	A
Beta-BHC	ND		ug/kg	1.74	0.658	1	A
Heptachlor	ND		ug/kg	0.868	0.389	1	A
Aldrin	ND		ug/kg	1.74	0.611	1	A
Heptachlor epoxide	ND		ug/kg	3.25	0.976	1	A
Endrin	ND		ug/kg	0.723	0.296	1	A
Endrin aldehyde	ND		ug/kg	2.17	0.759	1	A
Endrin ketone	ND		ug/kg	1.74	0.447	1	A
Dieldrin	ND		ug/kg	1.08	0.542	1	A
4,4'-DDE	ND		ug/kg	1.74	0.401	1	A
4,4'-DDD	ND		ug/kg	1.74	0.619	1	A
4,4'-DDT	ND		ug/kg	3.25	1.40	1	A
Endosulfan I	ND		ug/kg	1.74	0.410	1	A
Endosulfan II	ND		ug/kg	1.74	0.580	1	A
Endosulfan sulfate	ND		ug/kg	0.723	0.344	1	A
Methoxychlor	ND		ug/kg	3.25	1.01	1	A
Toxaphene	ND		ug/kg	32.5	9.11	1	A
cis-Chlordane	ND		ug/kg	2.17	0.604	1	A
trans-Chlordane	ND		ug/kg	2.17	0.573	1	A
Chlordane	ND		ug/kg	14.1	5.75	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	102		30-150	B
Decachlorobiphenyl	92		30-150	B
2,4,5,6-Tetrachloro-m-xylene	109		30-150	A
Decachlorobiphenyl	98		30-150	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/20/17 06:32
Analyst: JW

Extraction Method: EPA 3510C
Extraction Date: 12/16/17 20:12

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 09 Batch: WG1073595-1						
Delta-BHC	ND		ug/l	0.020	0.005	A
Lindane	ND		ug/l	0.020	0.004	A
Alpha-BHC	ND		ug/l	0.020	0.004	A
Beta-BHC	ND		ug/l	0.020	0.006	A
Heptachlor	ND		ug/l	0.020	0.003	A
Aldrin	ND		ug/l	0.020	0.002	A
Heptachlor epoxide	ND		ug/l	0.020	0.004	A
Endrin	ND		ug/l	0.040	0.004	A
Endrin aldehyde	ND		ug/l	0.040	0.008	A
Endrin ketone	ND		ug/l	0.040	0.005	A
Dieldrin	ND		ug/l	0.040	0.004	A
4,4'-DDE	ND		ug/l	0.040	0.004	A
4,4'-DDD	ND		ug/l	0.040	0.005	A
4,4'-DDT	ND		ug/l	0.040	0.004	A
Endosulfan I	ND		ug/l	0.020	0.003	A
Endosulfan II	ND		ug/l	0.040	0.005	A
Endosulfan sulfate	ND		ug/l	0.040	0.005	A
Methoxychlor	ND		ug/l	0.200	0.007	A
Toxaphene	ND		ug/l	0.200	0.063	A
cis-Chlordane	ND		ug/l	0.020	0.007	A
trans-Chlordane	ND		ug/l	0.020	0.006	A
Chlordane	ND		ug/l	0.200	0.046	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/20/17 06:32
Analyst: JW

Extraction Method: EPA 3510C
Extraction Date: 12/16/17 20:12

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 09 Batch: WG1073595-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	82		30-150	A
Decachlorobiphenyl	95		30-150	A
2,4,5,6-Tetrachloro-m-xylene	82		30-150	B
Decachlorobiphenyl	95		30-150	B

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/19/17 12:33
Analyst: CD

Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-08,10 Batch: WG1074141-1						
Delta-BHC	ND		ug/kg	1.60	0.313	A
Lindane	ND		ug/kg	0.666	0.298	A
Alpha-BHC	ND		ug/kg	0.666	0.189	A
Beta-BHC	ND		ug/kg	1.60	0.606	A
Heptachlor	ND		ug/kg	0.799	0.358	A
Aldrin	ND		ug/kg	1.60	0.562	A
Heptachlor epoxide	ND		ug/kg	3.00	0.899	A
Endrin	ND		ug/kg	0.666	0.273	A
Endrin aldehyde	ND		ug/kg	2.00	0.699	A
Endrin ketone	ND		ug/kg	1.60	0.411	A
Dieldrin	ND		ug/kg	0.999	0.499	A
4,4'-DDE	ND		ug/kg	1.60	0.370	A
4,4'-DDD	ND		ug/kg	1.60	0.570	A
4,4'-DDT	ND		ug/kg	3.00	1.28	A
Endosulfan I	ND		ug/kg	1.60	0.377	A
Endosulfan II	ND		ug/kg	1.60	0.534	A
Endosulfan sulfate	ND		ug/kg	0.666	0.317	A
Methoxychlor	ND		ug/kg	3.00	0.932	A
Toxaphene	ND		ug/kg	30.0	8.39	A
cis-Chlordane	ND		ug/kg	2.00	0.556	A
trans-Chlordane	ND		ug/kg	2.00	0.527	A
Chlordane	ND		ug/kg	13.0	5.29	A

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/19/17 12:33
Analyst: CD

Extraction Method: EPA 3546
Extraction Date: 12/18/17 22:09
Cleanup Method: EPA 3620B
Cleanup Date: 12/19/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-08,10 Batch: WG1074141-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	91		30-150	B
Decachlorobiphenyl	89		30-150	B
2,4,5,6-Tetrachloro-m-xylene	95		30-150	A
Decachlorobiphenyl	81		30-150	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 09 Batch: WG1073595-2 WG1073595-3									
Delta-BHC	67		86		30-150	**25**	Q	20	A
Lindane	65		83		30-150	**24**	Q	20	A
Alpha-BHC	68		88		30-150	**25**	Q	20	A
Beta-BHC	69		86		30-150	**22**	Q	20	A
Heptachlor	63		82		30-150	**25**	Q	20	A
Aldrin	63		80		30-150	**24**	Q	20	A
Heptachlor epoxide	69		90		30-150	**25**	Q	20	A
Endrin	68		84		30-150	**22**	Q	20	A
Endrin aldehyde	58		72		30-150	**22**	Q	20	A
Endrin ketone	64		80		30-150	**23**	Q	20	A
Dieldrin	67		85		30-150	**23**	Q	20	A
4,4'-DDE	62		80		30-150	**25**	Q	20	A
4,4'-DDD	63		80		30-150	**24**	Q	20	A
4,4'-DDT	69		86		30-150	**22**	Q	20	A
Endosulfan I	69		89		30-150	**24**	Q	20	A
Endosulfan II	69		89		30-150	**25**	Q	20	A
Endosulfan sulfate	72		91		30-150	**23**	Q	20	A
Methoxychlor	72		89		30-150	20		20	A
cis-Chlordane	66		85		30-150	**25**	Q	20	A
trans-Chlordane	65		84		30-150	**26**	Q	20	A

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 09 Batch: WG1073595-2 WG1073595-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	71		86		30-150	A
Decachlorobiphenyl	80		95		30-150	A
2,4,5,6-Tetrachloro-m-xylene	70		87		30-150	B
Decachlorobiphenyl	79		93		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-08,10 Batch: WG1074141-2 WG1074141-3									
Delta-BHC	91		101		30-150	10		30	A
Lindane	83		97		30-150	16		30	A
Alpha-BHC	92		104		30-150	12		30	A
Beta-BHC	85		97		30-150	13		30	A
Heptachlor	87		97		30-150	11		30	A
Aldrin	84		96		30-150	13		30	A
Heptachlor epoxide	73		82		30-150	12		30	A
Endrin	79		90		30-150	13		30	A
Endrin aldehyde	70		78		30-150	11		30	A
Endrin ketone	76		86		30-150	12		30	A
Dieldrin	88		101		30-150	14		30	A
4,4'-DDE	88		102		30-150	15		30	A
4,4'-DDD	82		95		30-150	15		30	A
4,4'-DDT	84		97		30-150	14		30	A
Endosulfan I	82		93		30-150	13		30	A
Endosulfan II	80		90		30-150	12		30	A
Endosulfan sulfate	70		81		30-150	15		30	A
Methoxychlor	73		84		30-150	14		30	A
cis-Chlordane	70		81		30-150	15		30	A
trans-Chlordane	77		85		30-150	10		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-08,10 Batch: WG1074141-2 WG1074141-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	89		100		30-150	B
Decachlorobiphenyl	85		96		30-150	B
2,4,5,6-Tetrachloro-m-xylene	91		99		30-150	A
Decachlorobiphenyl	68		78		30-150	A

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-08,10 QC Batch ID: WG1074141-4 WG1074141-5 QC Sample: L1745804-04 Client ID: SB002 (7-9)													
Delta-BHC	0.986J	36.9	34.2	93		35.2	94		30-150	3		50	B
Lindane	ND	36.9	32.1	87		33.6	90		30-150	5		50	A
Alpha-BHC	ND	36.9	33.3	90		34.6	93		30-150	4		50	A
Beta-BHC	ND	36.9	34.0	92		36.7	98		30-150	8		50	A
Heptachlor	ND	36.9	26.4	72		27.2	73		30-150	3		50	A
Aldrin	ND	36.9	31.2	85		32.6	87		30-150	4		50	A
Heptachlor epoxide	ND	36.9	33.0	90		34.2	92		30-150	4		50	A
Endrin	ND	36.9	34.4	93		35.7	96		30-150	4		50	A
Endrin aldehyde	ND	36.9	26.0	71		27.1	73		30-150	4		50	A
Endrin ketone	ND	36.9	28.5	77		30.1	81		30-150	5		50	A
Dieldrin	ND	36.9	34.0	92		34.9	94		30-150	3		50	A
4,4'-DDE	ND	36.9	30.5	83		31.3	84		30-150	3		50	A
4,4'-DDD	ND	36.9	30.8	84		31.9	86		30-150	4		50	A
4,4'-DDT	ND	36.9	34.9	95		37.1	99		30-150	6		50	A
Endosulfan I	ND	36.9	32.9	89		33.5	90		30-150	2		50	A
Endosulfan II	ND	36.9	33.2	90		35.0	94		30-150	5		50	A
Endosulfan sulfate	ND	36.9	29.6	80		32.0	86		30-150	8		50	A
Methoxychlor	ND	36.9	34.6	94		37.6	101		30-150	8		50	A
cis-Chlordane	ND	36.9	29.6	80		30.4	82		30-150	3		50	A
trans-Chlordane	ND	36.9	32.7	89		35.1	94		30-150	7		50	A

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1745804

Project Number: BBU1702 ***Report Date:*** 12/21/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*

Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-08,10 QC Batch ID: WG1074141-4 WG1074141-5 QC Sample: L1745804-04 Client ID: SB002 (7-9)

Surrogate	*MS % Recovery*	*MS Qualifier*	*MSD % Recovery*	*MSD Qualifier*	*Acceptance Criteria*	*Column*
2,4,5,6-Tetrachloro-m-xylene	88		90		30-150	B
Decachlorobiphenyl	106		105		30-150	B
2,4,5,6-Tetrachloro-m-xylene	88		89		30-150	A
Decachlorobiphenyl	90		92		30-150	A

METALS

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01 Date Collected: 12/11/17 09:00

Client ID: SB001 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 94%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	11000		mg/kg	8.22	2.22	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.11	0.312	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Arsenic, Total	0.847		mg/kg	0.822	0.171	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Barium, Total	109		mg/kg	0.822	0.143	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Beryllium, Total	0.773		mg/kg	0.411	0.027	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.822	0.081	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Calcium, Total	1950		mg/kg	8.22	2.88	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Chromium, Total	25.9		mg/kg	0.822	0.079	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Cobalt, Total	12.1		mg/kg	1.64	0.136	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Copper, Total	27.6		mg/kg	0.822	0.212	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Iron, Total	21800		mg/kg	4.11	0.742	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Lead, Total	3.62	J	mg/kg	4.11	0.220	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Magnesium, Total	4840		mg/kg	8.22	1.26	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Manganese, Total	968		mg/kg	0.822	0.131	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Mercury, Total	ND		mg/kg	0.07	0.01	1	12/20/17 08:00	12/20/17 19:48	EPA 7471B	1,7471B	EA
Nickel, Total	22.3		mg/kg	2.06	0.199	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Potassium, Total	2040		mg/kg	206	11.8	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.64	0.212	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.822	0.233	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Sodium, Total	223		mg/kg	164	2.59	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.64	0.259	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Vanadium, Total	40.2		mg/kg	0.822	0.167	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB
Zinc, Total	53.0		mg/kg	4.11	0.241	2	12/19/17 22:20	12/20/17 17:58	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02 Date Collected: 12/11/17 09:15

Client ID: SB001 (8-10) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	11600		mg/kg	8.79	2.37	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.39	0.334	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Arsenic, Total	1.50		mg/kg	0.879	0.183	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Barium, Total	80.7		mg/kg	0.879	0.153	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Beryllium, Total	0.800		mg/kg	0.439	0.029	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.879	0.086	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Calcium, Total	1100		mg/kg	8.79	3.08	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Chromium, Total	34.6		mg/kg	0.879	0.084	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Cobalt, Total	12.2		mg/kg	1.76	0.146	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Copper, Total	30.4		mg/kg	0.879	0.227	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Iron, Total	21300		mg/kg	4.39	0.794	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Lead, Total	4.78		mg/kg	4.39	0.236	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Magnesium, Total	3910		mg/kg	8.79	1.35	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Manganese, Total	693		mg/kg	0.879	0.140	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Mercury, Total	ND		mg/kg	0.07	0.02	1	12/20/17 08:00	12/20/17 19:50	EPA 7471B	1,7471B	EA
Nickel, Total	18.8		mg/kg	2.20	0.213	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Potassium, Total	2480		mg/kg	220	12.6	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.76	0.227	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.879	0.249	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Sodium, Total	60.2	J	mg/kg	176	2.77	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.76	0.277	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Vanadium, Total	40.5		mg/kg	0.879	0.178	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB
Zinc, Total	51.5		mg/kg	4.39	0.257	2	12/19/17 22:20	12/20/17 18:50	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03 Date Collected: 12/11/17 09:40

Client ID: SB002 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 85%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	15200		mg/kg	9.19	2.48	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.59	0.349	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Arsenic, Total	2.48		mg/kg	0.919	0.191	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Barium, Total	91.4		mg/kg	0.919	0.160	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Beryllium, Total	0.634		mg/kg	0.459	0.030	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.919	0.090	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Calcium, Total	1400		mg/kg	9.19	3.22	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Chromium, Total	24.3		mg/kg	0.919	0.088	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Cobalt, Total	9.44		mg/kg	1.84	0.152	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Copper, Total	12.8		mg/kg	0.919	0.237	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Iron, Total	19200		mg/kg	4.59	0.830	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Lead, Total	16.8		mg/kg	4.59	0.246	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Magnesium, Total	3010		mg/kg	9.19	1.41	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Manganese, Total	490		mg/kg	0.919	0.146	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Mercury, Total	0.07	J	mg/kg	0.08	0.02	1	12/20/17 08:00	12/20/17 19:52	EPA 7471B	1,7471B	EA
Nickel, Total	14.5		mg/kg	2.30	0.222	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Potassium, Total	706		mg/kg	230	13.2	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.84	0.237	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.919	0.260	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Sodium, Total	52.5	J	mg/kg	184	2.89	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.84	0.289	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Vanadium, Total	35.5		mg/kg	0.919	0.186	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB
Zinc, Total	51.1		mg/kg	4.59	0.269	2	12/19/17 22:20	12/20/17 18:55	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04 Date Collected: 12/11/17 09:50

Client ID: SB002 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	9960		mg/kg	8.80	2.38	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.40	0.334	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Arsenic, Total	0.616	J	mg/kg	0.880	0.183	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Barium, Total	67.2		mg/kg	0.880	0.153	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Beryllium, Total	0.669		mg/kg	0.440	0.029	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.880	0.086	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Calcium, Total	1570		mg/kg	8.80	3.08	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Chromium, Total	25.5		mg/kg	0.880	0.085	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Cobalt, Total	13.3		mg/kg	1.76	0.146	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Copper, Total	23.5		mg/kg	0.880	0.227	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Iron, Total	21000		mg/kg	4.40	0.795	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Lead, Total	4.85		mg/kg	4.40	0.236	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Magnesium, Total	4030		mg/kg	8.80	1.36	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Manganese, Total	624		mg/kg	0.880	0.140	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Mercury, Total	ND		mg/kg	0.07	0.02	1	12/20/17 08:00	12/20/17 19:40	EPA 7471B	1,7471B	EA
Nickel, Total	17.2		mg/kg	2.20	0.213	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Potassium, Total	2220		mg/kg	220	12.7	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.76	0.227	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.880	0.249	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Sodium, Total	50.7	J	mg/kg	176	2.77	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.76	0.277	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Vanadium, Total	33.5		mg/kg	0.880	0.179	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB
Zinc, Total	53.0		mg/kg	4.40	0.258	2	12/19/17 22:20	12/20/17 18:12	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05 Date Collected: 12/11/17 12:15

Client ID: SB003 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	6470		mg/kg	9.07	2.45	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.54	0.345	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Arsenic, Total	5.32		mg/kg	0.907	0.189	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Barium, Total	72.1		mg/kg	0.907	0.158	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Beryllium, Total	0.318	J	mg/kg	0.454	0.030	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.907	0.089	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Calcium, Total	90800		mg/kg	90.7	31.8	20	12/19/17 22:20	12/20/17 22:13	EPA 3050B	1,6010C	AB
Chromium, Total	9.34		mg/kg	0.907	0.087	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Cobalt, Total	3.23		mg/kg	1.81	0.151	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Copper, Total	12.1		mg/kg	0.907	0.234	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Iron, Total	9340		mg/kg	4.54	0.819	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Lead, Total	76.3		mg/kg	4.54	0.243	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Magnesium, Total	14800		mg/kg	9.07	1.40	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Manganese, Total	149		mg/kg	0.907	0.144	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Mercury, Total	0.05	J	mg/kg	0.08	0.02	1	12/20/17 08:00	12/20/17 19:53	EPA 7471B	1,7471B	EA
Nickel, Total	8.74		mg/kg	2.27	0.220	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Potassium, Total	842		mg/kg	227	13.1	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.81	0.234	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.907	0.257	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Sodium, Total	445		mg/kg	181	2.86	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.81	0.286	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Vanadium, Total	14.0		mg/kg	0.907	0.184	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB
Zinc, Total	53.5		mg/kg	4.54	0.266	2	12/19/17 22:20	12/20/17 19:00	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06 Date Collected: 12/11/17 12:25

Client ID: SB003 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	8390		mg/kg	8.97	2.42	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.49	0.341	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Arsenic, Total	3.75		mg/kg	0.897	0.187	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Barium, Total	109		mg/kg	0.897	0.156	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Beryllium, Total	0.386	J	mg/kg	0.449	0.030	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.897	0.088	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Calcium, Total	33500		mg/kg	8.97	3.14	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Chromium, Total	11.6		mg/kg	0.897	0.086	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Cobalt, Total	3.00		mg/kg	1.79	0.149	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Copper, Total	16.9		mg/kg	0.897	0.232	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Iron, Total	7930		mg/kg	4.49	0.810	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Lead, Total	80.4		mg/kg	4.49	0.240	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Magnesium, Total	5060		mg/kg	8.97	1.38	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Manganese, Total	192		mg/kg	0.897	0.143	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Mercury, Total	0.11		mg/kg	0.07	0.02	1	12/20/17 08:00	12/20/17 19:55	EPA 7471B	1,7471B	EA
Nickel, Total	6.97		mg/kg	2.24	0.217	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Potassium, Total	627		mg/kg	224	12.9	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.79	0.232	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.897	0.254	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Sodium, Total	824		mg/kg	179	2.83	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.79	0.283	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Vanadium, Total	15.2		mg/kg	0.897	0.182	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB
Zinc, Total	93.0		mg/kg	4.49	0.263	2	12/19/17 22:20	12/20/17 19:04	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07 Date Collected: 12/11/17 12:40

Client ID: SB004 (0-2) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	5930		mg/kg	8.80	2.38	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.40	0.334	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Arsenic, Total	3.15		mg/kg	0.880	0.183	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Barium, Total	76.0		mg/kg	0.880	0.153	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Beryllium, Total	0.255	J	mg/kg	0.440	0.029	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.880	0.086	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Calcium, Total	50300		mg/kg	8.80	3.08	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Chromium, Total	10.1		mg/kg	0.880	0.085	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Cobalt, Total	3.25		mg/kg	1.76	0.146	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Copper, Total	11.5		mg/kg	0.880	0.227	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Iron, Total	7940		mg/kg	4.40	0.794	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Lead, Total	85.8		mg/kg	4.40	0.236	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Magnesium, Total	3410		mg/kg	8.80	1.36	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Manganese, Total	140		mg/kg	0.880	0.140	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Mercury, Total	0.08		mg/kg	0.07	0.02	1	12/20/17 08:00	12/20/17 20:01	EPA 7471B	1,7471B	EA
Nickel, Total	10.6		mg/kg	2.20	0.213	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Potassium, Total	899		mg/kg	220	12.7	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.76	0.227	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.880	0.249	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Sodium, Total	303		mg/kg	176	2.77	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.76	0.277	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Vanadium, Total	16.0		mg/kg	0.880	0.179	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB
Zinc, Total	105		mg/kg	4.40	0.258	2	12/19/17 22:20	12/20/17 19:09	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08 Date Collected: 12/11/17 12:50

Client ID: SB004 (7-9) Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	5460		mg/kg	9.16	2.47	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.58	0.348	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Arsenic, Total	3.45		mg/kg	0.916	0.190	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Barium, Total	65.9		mg/kg	0.916	0.159	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Beryllium, Total	0.275	J	mg/kg	0.458	0.030	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.916	0.090	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Calcium, Total	57900		mg/kg	9.16	3.21	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Chromium, Total	11.8		mg/kg	0.916	0.088	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Cobalt, Total	3.56		mg/kg	1.83	0.152	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Copper, Total	28.2		mg/kg	0.916	0.236	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Iron, Total	9640		mg/kg	4.58	0.827	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Lead, Total	94.2		mg/kg	4.58	0.245	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Magnesium, Total	4340		mg/kg	9.16	1.41	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Manganese, Total	194		mg/kg	0.916	0.146	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Mercury, Total	7.6		mg/kg	0.36	0.08	5	12/20/17 08:00	12/20/17 22:22	EPA 7471B	1,7471B	EA
Nickel, Total	10.6		mg/kg	2.29	0.222	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Potassium, Total	1080		mg/kg	229	13.2	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.83	0.236	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.916	0.259	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Sodium, Total	260		mg/kg	183	2.88	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.83	0.288	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Vanadium, Total	15.1		mg/kg	0.916	0.186	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB
Zinc, Total	132		mg/kg	4.58	0.268	2	12/19/17 22:20	12/20/17 19:14	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-09 Date Collected: 12/11/17 10:30

Client ID: FIELD BLANK 001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	ND		mg/l	0.100	0.032	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Antimony, Total	ND		mg/l	0.050	0.007	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Arsenic, Total	ND		mg/l	0.005	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Barium, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Beryllium, Total	ND		mg/l	0.005	0.001	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Cadmium, Total	ND		mg/l	0.005	0.001	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Calcium, Total	0.700		mg/l	0.100	0.035	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Chromium, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Cobalt, Total	ND		mg/l	0.020	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Copper, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Iron, Total	ND		mg/l	0.050	0.009	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Lead, Total	ND		mg/l	0.010	0.003	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Magnesium, Total	ND		mg/l	0.100	0.015	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Manganese, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Mercury, Total	ND		mg/l	0.00020	0.00006	1	12/14/17 14:43	12/15/17 15:38	EPA 7470A	1,7470A	MG
Nickel, Total	ND		mg/l	0.025	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Potassium, Total	ND		mg/l	2.50	0.237	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Selenium, Total	ND		mg/l	0.010	0.004	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Silver, Total	ND		mg/l	0.007	0.003	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Sodium, Total	ND		mg/l	2.00	0.120	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Thallium, Total	ND		mg/l	0.020	0.003	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Vanadium, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB
Zinc, Total	0.002	J	mg/l	0.050	0.002	1	12/20/17 10:40	12/21/17 00:08	EPA 3005A	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10 Date Collected: 12/11/17 00:00

Client ID: DUP001 Date Received: 12/12/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 90%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	9180		mg/kg	8.54	2.31	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.27	0.324	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Arsenic, Total	1.49		mg/kg	0.854	0.178	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Barium, Total	41.5		mg/kg	0.854	0.149	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Beryllium, Total	0.418	J	mg/kg	0.427	0.028	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.854	0.084	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Calcium, Total	1050		mg/kg	8.54	2.99	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Chromium, Total	16.8		mg/kg	0.854	0.082	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Cobalt, Total	6.80		mg/kg	1.71	0.142	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Copper, Total	15.0		mg/kg	0.854	0.220	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Iron, Total	15100		mg/kg	4.27	0.771	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Lead, Total	7.69		mg/kg	4.27	0.229	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Magnesium, Total	2220		mg/kg	8.54	1.32	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Manganese, Total	417		mg/kg	0.854	0.136	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Mercury, Total	0.04	J	mg/kg	0.07	0.02	1	12/20/17 08:00	12/20/17 20:05	EPA 7471B	1,7471B	EA
Nickel, Total	11.9		mg/kg	2.14	0.207	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Potassium, Total	1260		mg/kg	214	12.3	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Selenium, Total	ND		mg/kg	1.71	0.220	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.854	0.242	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Sodium, Total	34.9	J	mg/kg	171	2.69	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.71	0.269	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Vanadium, Total	25.1		mg/kg	0.854	0.173	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB
Zinc, Total	33.7		mg/kg	4.27	0.250	2	12/19/17 22:20	12/20/17 19:19	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 09 Batch: WG1072785-1										
Mercury, Total	ND		mg/l	0.00020	0.00006	1	12/14/17 14:43	12/15/17 15:03	1,7470A	MG

Prep Information

Digestion Method: EPA 7470A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-08,10 Batch: WG1074609-1										
Aluminum, Total	ND		mg/kg	4.00	1.08	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Antimony, Total	ND		mg/kg	2.00	0.152	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Arsenic, Total	ND		mg/kg	0.400	0.083	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Barium, Total	ND		mg/kg	0.400	0.070	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Beryllium, Total	ND		mg/kg	0.200	0.013	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.400	0.039	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Calcium, Total	ND		mg/kg	4.00	1.40	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Chromium, Total	ND		mg/kg	0.400	0.038	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Cobalt, Total	ND		mg/kg	0.800	0.066	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Copper, Total	ND		mg/kg	0.400	0.103	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Iron, Total	ND		mg/kg	2.00	0.361	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Lead, Total	ND		mg/kg	2.00	0.107	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Magnesium, Total	ND		mg/kg	4.00	0.616	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Manganese, Total	ND		mg/kg	0.400	0.064	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Nickel, Total	ND		mg/kg	1.00	0.097	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Potassium, Total	ND		mg/kg	100	5.76	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Selenium, Total	ND		mg/kg	0.800	0.103	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Silver, Total	ND		mg/kg	0.400	0.113	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Sodium, Total	ND		mg/kg	80.0	1.26	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Thallium, Total	ND		mg/kg	0.800	0.126	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Vanadium, Total	ND		mg/kg	0.400	0.081	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB
Zinc, Total	ND		mg/kg	2.00	0.117	1	12/19/17 22:20	12/20/17 17:48	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Prep Information

Digestion Method: EPA 3050B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-08,10 Batch: WG1074717-1										
Mercury, Total	ND		mg/kg	0.08	0.02	1	12/20/17 08:00	12/20/17 19:33	1,7471B	EA

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 09 Batch: WG1074850-1										
Aluminum, Total	ND		mg/l	0.100	0.032	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Antimony, Total	ND		mg/l	0.050	0.007	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Arsenic, Total	0.002	J	mg/l	0.005	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Barium, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Beryllium, Total	ND		mg/l	0.005	0.001	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Cadmium, Total	ND		mg/l	0.005	0.001	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Calcium, Total	ND		mg/l	0.100	0.035	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Chromium, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Cobalt, Total	ND		mg/l	0.020	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Copper, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Iron, Total	ND		mg/l	0.050	0.009	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Lead, Total	ND		mg/l	0.010	0.003	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Magnesium, Total	ND		mg/l	0.100	0.015	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Manganese, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Nickel, Total	ND		mg/l	0.025	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Potassium, Total	ND		mg/l	2.50	0.237	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Selenium, Total	ND		mg/l	0.010	0.004	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Silver, Total	ND		mg/l	0.007	0.003	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Sodium, Total	ND		mg/l	2.00	0.120	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Thallium, Total	ND		mg/l	0.020	0.003	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB
Vanadium, Total	ND		mg/l	0.010	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1745804

Project Number: BBU1702 **Report Date:** 12/21/17

Method Blank Analysis
Batch Quality Control

Zinc, Total	ND	mg/l	0.050	0.002	1	12/20/17 10:40	12/21/17 00:04	1,6010C	AB

Prep Information

Digestion Method: EPA 3005A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 09 Batch: WG1072785-2								
Mercury, Total	107		-		80-120	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-08,10 Batch: WG1074609-2 SRM Lot Number: D098-540					
Aluminum, Total	61	-	47-153	-	
Antimony, Total	146	-	6-194	-	
Arsenic, Total	94	-	83-117	-	
Barium, Total	89	-	82-118	-	
Beryllium, Total	97	-	83-117	-	
Cadmium, Total	94	-	82-117	-	
Calcium, Total	88	-	81-118	-	
Chromium, Total	88	-	83-119	-	
Cobalt, Total	94	-	84-116	-	
Copper, Total	93	-	84-116	-	
Iron, Total	76	-	60-140	-	
Lead, Total	89	-	82-117	-	
Magnesium, Total	76	-	76-124	-	
Manganese, Total	90	-	82-118	-	
Nickel, Total	91	-	82-117	-	
Potassium, Total	78	-	69-131	-	
Selenium, Total	96	-	78-121	-	
Silver, Total	96	-	80-120	-	
Sodium, Total	92	-	74-126	-	
Thallium, Total	101	-	80-119	-	
Vanadium, Total	90	-	79-121	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-08,10 Batch: WG1074609-2 SRM Lot Number: D098-540					
Zinc, Total	91	-	81-119	-	
Total Metals - Mansfield Lab Associated sample(s): 01-08,10 Batch: WG1074717-2 SRM Lot Number: D098-540					
Mercury, Total	109	-	50-149	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 09 Batch: WG1074850-2					
Aluminum, Total	108	-	80-120	-	
Antimony, Total	86	-	80-120	-	
Arsenic, Total	108	-	80-120	-	
Barium, Total	100	-	80-120	-	
Beryllium, Total	102	-	80-120	-	
Cadmium, Total	100	-	80-120	-	
Calcium, Total	102	-	80-120	-	
Chromium, Total	96	-	80-120	-	
Cobalt, Total	94	-	80-120	-	
Copper, Total	96	-	80-120	-	
Iron, Total	97	-	80-120	-	
Lead, Total	103	-	80-120	-	
Magnesium, Total	109	-	80-120	-	
Manganese, Total	89	-	80-120	-	
Nickel, Total	94	-	80-120	-	
Potassium, Total	108	-	80-120	-	
Selenium, Total	104	-	80-120	-	
Silver, Total	100	-	80-120	-	
Sodium, Total	110	-	80-120	-	
Thallium, Total	102	-	80-120	-	
Vanadium, Total	98	-	80-120	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1745804

Report Date: 12/21/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 09 Batch: WG1074850-2					
Zinc, Total	100	-	80-120	-	

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 09 QC Batch ID: WG1072785-3 WG1072785-4 QC Sample: L1745590-04 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00490	98		0.00462	92		75-125	6		20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery		MSD Found	MSD %Recovery		Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-08,10 QC Batch ID: WG1074609-3 WG1074609-4 QC Sample: L1745804-04 Client ID: SB002 (7-9)											
Aluminum, Total	9960	179	10700	**413**	Q	12200	**1300**	Q	75-125	13	20
Antimony, Total	ND	44.8	37.0	83		34.0	79		75-125	8	20
Arsenic, Total	0.616J	10.7	10.2	95		9.86	95		75-125	3	20
Barium, Total	67.2	179	242	98		239	99		75-125	1	20
Beryllium, Total	0.669	4.48	5.16	100		5.03	101		75-125	3	20
Cadmium, Total	ND	4.56	2.72	**60**	Q	2.43	**55**	Q	75-125	11	20
Calcium, Total	1570	895	2480	102		2960	**161**	Q	75-125	18	20
Chromium, Total	25.5	17.9	45.6	112		45.5	116		75-125	0	20
Cobalt, Total	13.3	44.8	52.2	87		51.4	88		75-125	2	20
Copper, Total	23.5	22.4	45.7	99		49.5	120		75-125	8	20
Iron, Total	21000	89.5	21800	**894**	Q	24300	**3820**	Q	75-125	11	20
Lead, Total	4.85	45.6	44.5	87		43.3	87		75-125	3	20
Magnesium, Total	4030	895	4970	105		5390	**158**	Q	75-125	8	20
Manganese, Total	624.	44.8	654	**67**	Q	719	**220**	Q	75-125	9	20
Nickel, Total	17.2	44.8	54.7	84		56.1	90		75-125	3	20
Potassium, Total	2220	895	3120	100		3380	**134**	Q	75-125	8	20
Selenium, Total	ND	10.7	8.93	83		8.26	80		75-125	8	20
Silver, Total	ND	26.8	26.8	100		25.6	99		75-125	5	20
Sodium, Total	50.7J	895	941	105		908	105		75-125	4	20
Thallium, Total	ND	10.7	9.70	90		9.20	89		75-125	5	20
Vanadium, Total	33.5	44.8	77.0	97		79.6	107		75-125	3	20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery		MSD Found	MSD %Recovery		Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-08,10 QC Batch ID: WG1074609-3 WG1074609-4 QC Sample: L1745804-04 Client ID: SB002 (7-9)											
Zinc, Total	53.0	44.8	95.0	94		101	111		75-125	6	20
Total Metals - Mansfield Lab Associated sample(s): 01-08,10 QC Batch ID: WG1074717-3 WG1074717-4 QC Sample: L1745804-04 Client ID: SB002 (7-9)											
Mercury, Total	ND	0.141	0.20	**142**	Q	0.20	**142**	Q	80-120	0	20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery		MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 09 QC Batch ID: WG1074850-3 QC Sample: L1745665-01 Client ID: MS Sample										
Aluminum, Total	ND	2	2.24	112		-	-	75-125	-	20
Antimony, Total	ND	0.5	0.518	104		-	-	75-125	-	20
Arsenic, Total	0.003J	0.12	0.004J	**0**	Q	-	-	75-125	-	20
Barium, Total	0.090	2	2.11	101		-	-	75-125	-	20
Beryllium, Total	ND	0.05	0.050	100		-	-	75-125	-	20
Cadmium, Total	ND	0.051	0.047	93		-	-	75-125	-	20
Calcium, Total	70.2	10	77.2	**70**	Q	-	-	75-125	-	20
Chromium, Total	1.09	0.2	1.23	**70**	Q	-	-	75-125	-	20
Cobalt, Total	ND	0.5	0.459	92		-	-	75-125	-	20
Copper, Total	ND	0.25	0.250	100		-	-	75-125	-	20
Iron, Total	0.013J	1	0.938	94		-	-	75-125	-	20
Lead, Total	0.004J	0.51	0.003J	**0**	Q	-	-	75-125	-	20
Magnesium, Total	13.2	10	22.3	91		-	-	75-125	-	20
Manganese, Total	0.051	0.5	0.481	86		-	-	75-125	-	20
Nickel, Total	ND	0.5	0.456	91		-	-	75-125	-	20
Potassium, Total	6.16	10	19.2	**130**	Q	-	-	75-125	-	20
Selenium, Total	ND	0.12	ND	**0**	Q	-	-	75-125	-	20
Silver, Total	ND	0.05	0.054	107		-	-	75-125	-	20
Sodium, Total	315.	10	319	**40**	Q	-	-	75-125	-	20
Thallium, Total	0.003J	0.12	ND	**0**	Q	-	-	75-125	-	20
Vanadium, Total	ND	0.5	0.499	100		-	-	75-125	-	20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 09 QC Batch ID: WG1074850-3 QC Sample: L1745665-01 Client ID: MS Sample									
Zinc, Total	0.021J	0.5	0.516	103	-	-	75-125	-	20

Lab Duplicate Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 09 QC Batch ID: WG1074850-4 QC Sample: L1745665-01 Client ID: DUP Sample						
Chromium, Total	1.09	1.09	mg/l	0		20
Iron, Total	0.013J	ND	mg/l	NC		20

INORGANICS
&
MISCELLANEOUS

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-01
Client ID: SB001 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 09:00
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	93.5		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-02
Client ID: SB001 (8-10)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 09:15
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.6		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-03
Client ID: SB002 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 09:40
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	84.5		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-04
Client ID: SB002 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 09:50
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	89.1		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-05
Client ID: SB003 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 12:15
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	85.5		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-06
Client ID: SB003 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 12:25
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	87.2		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-07
Client ID: SB004 (0-2)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 12:40
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.3		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-08
Client ID: SB004 (7-9)
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 12:50
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.3		%	0.100	NA	1	-	12/19/17 12:17	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

SAMPLE RESULTS

Lab ID: L1745804-10
Client ID: DUP001
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil

Date Collected: 12/11/17 00:00
Date Received: 12/12/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90.2		%	0.100	NA	1	-	12/16/17 11:48	121,2540G	RI

Lab Duplicate Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-07,10 QC Batch ID: WG1073504-1 QC Sample: L1745804-04 Client ID: SB002 (7-9)						
Solids, Total	89.1	89.5	%	0		20
General Chemistry - Westborough Lab Associated sample(s): 08 QC Batch ID: WG1074313-1 QC Sample: L1746641-01 Client ID: DUP Sample						
Solids, Total	70.7	74.5	%	5		20

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1745804-01A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-01B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-01C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-01D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-01E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-01F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-02A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-02B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-02C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-02D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-02E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-02F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-03A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-03B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-03C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-03D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1745804-03E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-03F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-04A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-04A1	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-04A2	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-04B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-04B1	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-04B2	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-04C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-04C1	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-04C2	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-04D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-04D1	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-04D2	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-04E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-04E1	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-04E2	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-04F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1745804-04F1	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-04F2	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-05A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-05B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-05C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-05D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-05E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-05F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-06A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-06B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-06C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-06D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-06E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-06F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-07A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-07B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-07C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-07D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-07E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1745804-07F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-08A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-08B	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-08C	Vial water preserved	A	NA		4.2	Y	Absent	13-DEC-17 08:02	NYTCL-8260HLW(14)
L1745804-08D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)
L1745804-08E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-08F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-09A	Vial HCl preserved	C	NA		2.7	Y	Absent		NYTCL-8260(14)
L1745804-09B	Vial HCl preserved	C	NA		2.7	Y	Absent		NYTCL-8260(14)
L1745804-09C	Vial HCl preserved	C	NA		2.7	Y	Absent		NYTCL-8260(14)
L1745804-09D	Plastic 250ml unpreserved	C	7	7	2.7	Y	Absent		HOLD-METAL-DISSOLVED(180)
L1745804-09E	Plastic 250ml HNO3 preserved	C	<2	<2	2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-09F	Amber 500ml unpreserved	C	7	7	2.7	Y	Absent		NYTCL-8081(7)
L1745804-09G	Amber 500ml unpreserved	C	7	7	2.7	Y	Absent		NYTCL-8081(7)
L1745804-09H	Amber 1000ml unpreserved	C	7	7	2.7	Y	Absent		NYTCL-8082-1200ML(7)
L1745804-09I	Amber 1000ml unpreserved	C	7	7	2.7	Y	Absent		NYTCL-8082-1200ML(7)
L1745804-09J	Amber 1000ml unpreserved	C	7	7	2.7	Y	Absent		NYTCL-8270(7)
L1745804-09K	Amber 1000ml unpreserved	C	7	7	2.7	Y	Absent		NYTCL-8270(7)
L1745804-10A	Vial MeOH preserved	A	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1745804-10B	Vial water preserved	A	NA		4.2	Y	Absent	**13-DEC-17 08:02**	NYTCL-8260HLW(14)
L1745804-10C	Vial water preserved	A	NA		4.2	Y	Absent	**13-DEC-17 08:02**	NYTCL-8260HLW(14)
L1745804-10D	Plastic 2oz unpreserved for TS	A	NA		4.2	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1745804
Report Date: 12/21/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1745804-10E	Metals Only-Glass 60mL/2oz unpreserved	A	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1745804-10F	Glass 250ml/8oz unpreserved	A	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1745804-11A	Vial HCl preserved	A	NA		4.2	Y	Absent		NYTCL-8260(14)
L1745804-11B	Vial HCl preserved	A	NA		4.2	Y	Absent		NYTCL-8260(14)

*Values in parentheses indicate holding time in days

Project Name:	BBU1702	**Lab Number:**	L1745804
Project Number:	BBU1702	**Report Date:**	12/21/17

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Report Format: DU Report with 'J' Qualifiers

Project Name:	BBU1702	**Lab Number:**	L1745804
Project Number:	BBU1702	**Report Date:**	12/21/17

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

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

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

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

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers

Project Name:	BBU1702	**Lab Number:**	L1745804
Project Number:	BBU1702	**Report Date:**	12/21/17

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

NEW YORK CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of 2

Date Rec'd in Lab: 12/13/17

ALPHA Job #: L1745804

Client Information
Client: PWGC
Address: 630 Johnson Ave
Bohemia, NY 11716
Phone: 631-589-6353
Fax:
Email: thomasm@pwgresser.com

Project Information
Project Name:
Project Location: 718 E. 212th St, Bronx, NY
Project # BBU1702
(Use Project name as Project #) ☒
Project Manager: Thomas Melia
ALPHAQuote #:

Turn-Around Time
Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables
☒ ASP-A ☐ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement
☐ NY TOGS ☐ NY Part 375
☐ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Billing Information
☒ Same as Client Info
PO #

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOC (8260)	SVOC (8270)	Pesticides (8081)	PCBs (8082)	TAL Metals (6010) (747)	Total Bottle
45804-01	SB001 (0-2)	12-11-17	0900	S	KC	X	X	X	X	X	6
-02	SB001 (8-10)		0915								
-03	SB002 (0-2)		0940								
-04	SB002 (7-9)		0950								
-04	SB002 (7-9) MS		0950								
-04	SB002 (7-9) MSD		0950								
-05	SB003 (0-2)		1215								
-06	SB003 (7-9)		1225								
-07	SB004 (0-2)		1240								
-08	SB004 (7-9)		1250								

Container Type: O A A A A
Preservative: O A A A A

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
	12-12-17 1540		12/12/17 1540
	12/12/17 1940		EXCEL
	EXCEL		12/13/17 0300

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

NEW YORK CHAIN OF CUSTODY

ALPHA

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page: 2 of 2

Date Rec'd in Lab: 12/13/17

ALPHA Job #: L1745804

Client Information
Client: PWGC
Address: 630 Johnson Ave
Bohemia, NY 11716
Phone: 631-664-2016
Fax:
Email: thomasm@pwgrosser.com

Project Information
Project Name:
Project Location: 718 E. 212th Street, Bronx
Project #: BBU1702
(Use Project name as Project #)
Project Manager: Thomas Melia
ALPHAQuote #:

Turn-Around Time
Standard: [X] Due Date:
Rush (only if pre approved): [ ] # of Days:

Deliverables
[X] ASP-A [ ] ASP-B
[ ] EQuIS (1 File) [ ] EQuIS (4 File)
[ ] Other

Regulatory Requirement
[ ] NY TOGS [ ] NY Part 375
[ ] AWQ Standards [ ] NY CP-51
[ ] NY Restricted Use [ ] Other
[ ] NY Unrestricted Use
[ ] NYC Sewer Discharge

Billing Information
[X] Same as Client Info
PO #

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
[ ] NJ [ ] NY
[ ] Other:

[ ] These samples have been previously analyzed by Alpha

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
[ ] Done
[ ] Lab to do
Preservation
[ ] Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOC (8260)	SVOC (8270)	Pesticides (8081)	PCBs (8082)	TAL Metals (6010) (7471)	Total Bottle	Sample Specific Comments
45804-09	Field Blank 001	12-11-17	1030	WT	KC	X	X	X	X	X		
-10	DUP 001	↓	XX	S	KC	X	X	X	X	X	6	
11	Trip Blank	XX	XX	WT	XX	X					2	

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Container Type	O	A	A	A	A				
Preservative	O	A	A	A	A				

Relinquished By:	Date/Time	Received By:	Date/Time
	12-12-17 1540		12/12/17
	12 12 17 1940		12/12 tx
	12/13		12/13/17 0300

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

ANALYTICAL REPORT

Lab Number:	L1745989
Client:	P. W. Grosser 630 Johnson Avenue Suite 7 Bohemia, NY 11716
ATTN:	Thomas Melia
Phone:	(631) 589-6353
Project Name:	Not Specified
Project Number:	BBU1702
Report Date:	12/20/17

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), NJ NELAP (MA015), CT (PH-0141), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-13-00067), USFWS (Permit #LE2069641).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1745989-01	VP001	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:24	12/13/17
L1745989-02	VP002	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:31	12/13/17
L1745989-03	VP003	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:23	12/13/17
L1745989-04	VP004	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:43	12/13/17
L1745989-05	VP005	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:52	12/13/17
L1745989-06	VP006	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 11:00	12/13/17
L1745989-07	VP007	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 09:54	12/13/17
L1745989-08	VP008	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:30	12/13/17
L1745989-09	AA001	AIR	718 E. 212TH ST., BRONX, NY	12/12/17 10:32	12/13/17

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	Not Specified	**Lab Number:**	L1745989
Project Number:	BBU1702	**Report Date:**	12/20/17

Case Narrative (continued)

Volatile Organics in Air

Canisters were released from the laboratory on December 8, 2017. The canister certification results are provided as an addendum.

L1745989-05 The presence of Acetone could not be determined in this sample due to a non-target compound interfering with the identification and quantification of this compound.

The WG1074501-3 LCS recoveries for benzyl chloride (134%), 1,2,4-trichlorobenzene (141%) and hexachlorobutadiene (143%) are above the upper 130% acceptance limit. All samples associated with this LCS do not have reportable amounts of these analytes.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Christopher J. Anderson

Title: Technical Director/Representative Date: 12/20/17

AIR

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-01
Client ID: VP001
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 21:24
Analyst: RY

Date Collected: 12/12/17 10:24
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.324	0.200	--	1.60	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	4.97	0.200	--	11.0	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	5.65	5.00	--	10.6	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	23.3	1.00	--	55.3	2.38	--		1
Trichlorofluoromethane	0.289	0.200	--	1.62	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	1.11	0.500	--	3.36	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	1.41	0.200	--	4.39	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.339	0.200	--	1.34	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	11.0	0.500	--	32.4	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-01 Date Collected: 12/12/17 10:24
Client ID: VP001 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.459	0.200	--	2.24	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.19	0.200	--	7.72	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	2.43	0.200	--	7.76	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	0.314	0.200	--	1.08	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	0.961	0.200	--	3.94	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	3.10	0.200	--	11.7	0.754	--		1
2-Hexanone	1.60	0.200	--	6.56	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	5.80	0.200	--	39.3	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.790	0.200	--	3.43	0.869	--		1
p/m-Xylene	2.36	0.400	--	10.3	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.384	0.200	--	1.63	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-01 Date Collected: 12/12/17 10:24

Client ID: VP001 Date Received: 12/13/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.872	0.200	--	3.79	0.869	--		1
4-Ethyltoluene	0.237	0.200	--	1.17	0.983	--		1
1,3,5-Trimethylbenzene	0.337	0.200	--	1.66	0.983	--		1
1,2,4-Trimethylbenzene	0.933	0.200	--	4.59	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	75		60-140
Bromochloromethane	83		60-140
chlorobenzene-d5	88		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-02
Client ID: VP002
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 22:34
Analyst: RY

Date Collected: 12/12/17 10:31
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.436	0.200	--	2.16	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	4.51	0.200	--	9.98	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	33.6	1.00	--	79.8	2.38	--		1
Trichlorofluoromethane	0.227	0.200	--	1.28	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	2.03	0.500	--	6.15	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	2.52	0.200	--	7.85	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.454	0.200	--	1.80	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	12.0	0.500	--	35.4	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-02 Date Collected: 12/12/17 10:31
Client ID: VP002 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.889	0.200	--	4.34	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.80	0.200	--	9.87	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	2.68	0.200	--	8.56	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	0.360	0.200	--	1.24	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	0.994	0.200	--	4.07	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	4.64	0.200	--	17.5	0.754	--		1
2-Hexanone	1.72	0.200	--	7.05	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	1.26	0.200	--	8.54	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.937	0.200	--	4.07	0.869	--		1
p/m-Xylene	2.80	0.400	--	12.2	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.474	0.200	--	2.02	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-02 Date Collected: 12/12/17 10:31
Client ID: VP002 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.997	0.200	--	4.33	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.464	0.200	--	2.28	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	106		60-140
Bromochloromethane	96		60-140
chlorobenzene-d5	101		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-03
Client ID: VP003
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 23:09
Analyst: RY

Date Collected: 12/12/17 10:23
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.217	0.200	--	1.07	0.989	--		1
Chloromethane	0.218	0.200	--	0.450	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	4.23	0.200	--	9.36	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	6.92	5.00	--	13.0	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	59.6	1.00	--	142	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	0.996	0.500	--	3.02	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	1.96	0.200	--	6.10	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.263	0.200	--	1.04	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	14.5	0.500	--	42.8	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-03 Date Collected: 12/12/17 10:23
Client ID: VP003 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.461	0.200	--	2.25	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.15	0.200	--	7.58	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	1.83	0.200	--	5.85	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	2.99	0.200	--	10.3	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	0.577	0.200	--	2.36	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	1.88	0.200	--	7.08	0.754	--		1
2-Hexanone	1.72	0.200	--	7.05	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.458	0.200	--	1.99	0.869	--		1
p/m-Xylene	1.54	0.400	--	6.69	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.382	0.200	--	1.63	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-03 Date Collected: 12/12/17 10:23
Client ID: VP003 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.574	0.200	--	2.49	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.358	0.200	--	1.76	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	116		60-140
Bromochloromethane	105		60-140
chlorobenzene-d5	106		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID:	L1745989-04	Date Collected:	12/12/17 10:43
Client ID:	VP004	Date Received:	12/13/17
Sample Location:	718 E. 212TH ST., BRONX, NY	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Anaytical Method:	48,TO-15		
Analytical Date:	12/19/17 23:43		
Analyst:	RY		

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.341	0.200	--	1.69	0.989	--		1
Chloromethane	0.580	0.200	--	1.20	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	27.3	5.00	--	51.4	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	121	1.00	--	287	2.38	--		1
Trichlorofluoromethane	0.222	0.200	--	1.25	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	0.657	0.500	--	1.99	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	21.2	0.500	--	62.5	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	0.900	0.500	--	3.24	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-04 Date Collected: 12/12/17 10:43
Client ID: VP004 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.260	0.200	--	0.831	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.689	0.200	--	2.60	0.754	--		1
2-Hexanone	2.16	0.200	--	8.85	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.850	0.200	--	3.69	0.869	--		1
p/m-Xylene	0.992	0.400	--	4.31	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	1.01	0.200	--	4.30	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-04 Date Collected: 12/12/17 10:43

Client ID: VP004 Date Received: 12/13/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.361	0.200	--	1.57	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.349	0.200	--	1.72	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	109		60-140
Bromochloromethane	105		60-140
chlorobenzene-d5	105		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-05
Client ID: VP005
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/20/17 00:18
Analyst: RY

Date Collected: 12/12/17 10:52
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.229	0.200	--	1.13	0.989	--		1
Chloromethane	0.287	0.200	--	0.593	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	1.84	0.200	--	4.07	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	2.58	0.200	--	8.03	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	3.80	0.500	--	11.2	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-05 Date Collected: 12/12/17 10:52
Client ID: VP005 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.471	0.200	--	2.30	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.85	0.200	--	10.0	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	1.63	0.200	--	5.21	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	0.931	0.200	--	3.20	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	1.22	0.200	--	5.00	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	1.25	0.200	--	4.71	0.754	--		1
2-Hexanone	0.291	0.200	--	1.19	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.373	0.200	--	1.62	0.869	--		1
p/m-Xylene	1.53	0.400	--	6.65	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.391	0.200	--	1.66	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-05 Date Collected: 12/12/17 10:52
Client ID: VP005 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.636	0.200	--	2.76	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.446	0.200	--	2.19	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	111		60-140
Bromochloromethane	105		60-140
chlorobenzene-d5	108		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID:	L1745989-06	Date Collected:	12/12/17 11:00
Client ID:	VP006	Date Received:	12/13/17
Sample Location:	718 E. 212TH ST., BRONX, NY	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Anaytical Method:	48,TO-15		
Analytical Date:	12/20/17 00:53		
Analyst:	RY		

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	0.236	0.200	--	0.487	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	22.8	0.200	--	50.4	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	65.4	1.00	--	155	2.38	--		1
Trichlorofluoromethane	0.284	0.200	--	1.60	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	1.00	0.500	--	3.03	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	32.7	0.200	--	102	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.752	0.200	--	2.98	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	19.0	0.500	--	56.0	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-06 Date Collected: 12/12/17 11:00
Client ID: VP006 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.736	0.200	--	3.59	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	11.6	0.200	--	40.9	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	2.70	0.200	--	8.63	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	1.99	0.200	--	6.85	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	3.33	0.200	--	13.6	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	4.64	0.200	--	17.5	0.754	--		1
2-Hexanone	2.00	0.200	--	8.20	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	0.519	0.200	--	3.52	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.887	0.200	--	3.85	0.869	--		1
p/m-Xylene	2.54	0.400	--	11.0	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.510	0.200	--	2.17	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-06 Date Collected: 12/12/17 11:00
Client ID: VP006 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.921	0.200	--	4.00	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.452	0.200	--	2.22	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	114		60-140
Bromochloromethane	110		60-140
chlorobenzene-d5	118		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-07
Client ID: VP007
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/20/17 01:27
Analyst: RY

Date Collected: 12/12/17 09:54
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.363	0.200	--	1.79	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	20.1	1.00	--	47.7	2.38	--		1
Trichlorofluoromethane	0.228	0.200	--	1.28	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	1.34	0.500	--	4.06	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	0.674	0.200	--	2.10	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	3.92	0.500	--	11.6	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-07 Date Collected: 12/12/17 09:54
Client ID: VP007 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.488	0.200	--	2.38	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.394	0.200	--	1.26	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.732	0.200	--	2.76	0.754	--		1
2-Hexanone	0.336	0.200	--	1.38	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	2.79	0.200	--	18.9	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.305	0.200	--	1.32	0.869	--		1
p/m-Xylene	1.36	0.400	--	5.91	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.286	0.200	--	1.22	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-07 Date Collected: 12/12/17 09:54
Client ID: VP007 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.463	0.200	--	2.01	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.461	0.200	--	2.27	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	106		60-140
Bromochloromethane	112		60-140
chlorobenzene-d5	113		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-08
Client ID: VP008
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/20/17 02:02
Analyst: RY

Date Collected: 12/12/17 10:30
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.352	0.200	--	1.74	0.989	--		1
Chloromethane	0.362	0.200	--	0.748	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	26.8	1.00	--	63.7	2.38	--		1
Trichlorofluoromethane	0.217	0.200	--	1.22	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	5.34	0.500	--	15.7	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-08 Date Collected: 12/12/17 10:30
Client ID: VP008 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.215	0.200	--	0.687	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.441	0.200	--	1.66	0.754	--		1
2-Hexanone	0.314	0.200	--	1.29	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	0.521	0.400	--	2.26	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-08 Date Collected: 12/12/17 10:30
Client ID: VP008 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.200	0.200	--	0.869	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	107		60-140
Bromochloromethane	114		60-140
chlorobenzene-d5	113		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-09
Client ID: AA001
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 16:46
Analyst: RY

Date Collected: 12/12/17 10:32
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.283	0.200	--	1.40	0.989	--		1
Chloromethane	0.523	0.200	--	1.08	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	2.04	1.00	--	4.85	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	0.577	0.500	--	1.42	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-09 Date Collected: 12/12/17 10:32
Client ID: AA001 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.544	0.200	--	1.74	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.215	0.200	--	0.810	0.754	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.575	0.200	--	2.50	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-09 Date Collected: 12/12/17 10:32
Client ID: AA001 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.376	0.200	--	1.85	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	78		60-140
Bromochloromethane	93		60-140
chlorobenzene-d5	86		60-140

Project Name: Not Specified
Project Number: BBU1702
Lab Number: L1745989
Report Date: 12/20/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/19/17 14:37

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-09 Batch: WG1074501-4								
Propylene	ND	0.500	--	ND	0.861	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1

Project Name: Not Specified
Project Number: BBU1702
Lab Number: L1745989
Report Date: 12/20/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/19/17 14:37

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-09 Batch: WG1074501-4								
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1

Project Name: Not Specified
Project Number: BBU1702
Lab Number: L1745989
Report Date: 12/20/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/19/17 14:37

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-09 Batch: WG1074501-4								
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					
No Tentatively Identified Compounds					

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
Chlorodifluoromethane	84		-		70-130	-		
Propylene	90		-		70-130	-		
Propane	**63**	Q	-		70-130	-		
Dichlorodifluoromethane	70		-		70-130	-		
Chloromethane	92		-		70-130	-		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	103		-		70-130	-		
Methanol	79		-		70-130	-		
Vinyl chloride	96		-		70-130	-		
1,3-Butadiene	98		-		70-130	-		
Butane	81		-		70-130	-		
Bromomethane	104		-		70-130	-		
Chloroethane	99		-		70-130	-		
Ethyl Alcohol	88		-		70-130	-		
Dichlorofluoromethane	93		-		70-130	-		
Vinyl bromide	107		-		70-130	-		
Acrolein	92		-		70-130	-		
Acetone	101		-		70-130	-		
Acetonitrile	83		-		70-130	-		
Trichlorofluoromethane	113		-		70-130	-		
iso-Propyl Alcohol	101		-		70-130	-		
Acrylonitrile	92		-		70-130	-		
Pentane	87		-		70-130	-		
Ethyl ether	88		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
1,1-Dichloroethene	100		-		70-130	-		
tert-Butyl Alcohol	97		-		70-130	-		
Methylene chloride	103		-		70-130	-		
3-Chloropropene	101		-		70-130	-		
Carbon disulfide	97		-		70-130	-		
1,1,2-Trichloro-1,2,2-Trifluoroethane	105		-		70-130	-		
trans-1,2-Dichloroethene	96		-		70-130	-		
1,1-Dichloroethane	100		-		70-130	-		
Methyl tert butyl ether	98		-		70-130	-		
Vinyl acetate	122		-		70-130	-		
2-Butanone	96		-		70-130	-		
cis-1,2-Dichloroethene	96		-		70-130	-		
Ethyl Acetate	115		-		70-130	-		
Chloroform	109		-		70-130	-		
Tetrahydrofuran	95		-		70-130	-		
2,2-Dichloropropane	103		-		70-130	-		
1,2-Dichloroethane	102		-		70-130	-		
n-Hexane	93		-		70-130	-		
Isopropyl Ether	86		-		70-130	-		
Ethyl-Tert-Butyl-Ether	84		-		70-130	-		
1,1,1-Trichloroethane	102		-		70-130	-		
1,1-Dichloropropene	84		-		70-130	-		
Benzene	92		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
Carbon tetrachloride	105		-		70-130	-		
Cyclohexane	87		-		70-130	-		
Tertiary-Amyl Methyl Ether	89		-		70-130	-		
Dibromomethane	89		-		70-130	-		
1,2-Dichloropropane	92		-		70-130	-		
Bromodichloromethane	100		-		70-130	-		
1,4-Dioxane	94		-		70-130	-		
Trichloroethene	100		-		70-130	-		
2,2,4-Trimethylpentane	96		-		70-130	-		
Methyl Methacrylate	94		-		70-130	-		
Heptane	92		-		70-130	-		
cis-1,3-Dichloropropene	100		-		70-130	-		
4-Methyl-2-pentanone	96		-		70-130	-		
trans-1,3-Dichloropropene	87		-		70-130	-		
1,1,2-Trichloroethane	99		-		70-130	-		
Toluene	106		-		70-130	-		
1,3-Dichloropropane	100		-		70-130	-		
2-Hexanone	105		-		70-130	-		
Dibromochloromethane	121		-		70-130	-		
1,2-Dibromoethane	113		-		70-130	-		
Butyl Acetate	101		-		70-130	-		
Octane	98		-		70-130	-		
Tetrachloroethene	116		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: Not Specified

Project Number: BBU1702

Lab Number: L1745989

Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
1,1,1,2-Tetrachloroethane	110		-		70-130	-		
Chlorobenzene	114		-		70-130	-		
Ethylbenzene	108		-		70-130	-		
p/m-Xylene	112		-		70-130	-		
Bromoform	128		-		70-130	-		
Styrene	112		-		70-130	-		
1,1,2,2-Tetrachloroethane	118		-		70-130	-		
o-Xylene	116		-		70-130	-		
1,2,3-Trichloropropane	106		-		70-130	-		
Nonane (C9)	102		-		70-130	-		
Isopropylbenzene	112		-		70-130	-		
Bromobenzene	104		-		70-130	-		
o-Chlorotoluene	110		-		70-130	-		
n-Propylbenzene	114		-		70-130	-		
p-Chlorotoluene	105		-		70-130	-		
4-Ethyltoluene	115		-		70-130	-		
1,3,5-Trimethylbenzene	120		-		70-130	-		
tert-Butylbenzene	115		-		70-130	-		
1,2,4-Trimethylbenzene	124		-		70-130	-		
Decane (C10)	110		-		70-130	-		
Benzyl chloride	**134**	Q	-		70-130	-		
1,3-Dichlorobenzene	126		-		70-130	-		
1,4-Dichlorobenzene	124		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
sec-Butylbenzene	116		-		70-130	-		
p-Isopropyltoluene	109		-		70-130	-		
1,2-Dichlorobenzene	128		-		70-130	-		
n-Butylbenzene	119		-		70-130	-		
1,2-Dibromo-3-chloropropane	109		-		70-130	-		
Undecane	114		-		70-130	-		
Dodecane (C12)	113		-		70-130	-		
1,2,4-Trichlorobenzene	**141**	Q	-		70-130	-		
Naphthalene	116		-		70-130	-		
1,2,3-Trichlorobenzene	124		-		70-130	-		
Hexachlorobutadiene	**143**	Q	-		70-130	-		

Lab Duplicate Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1074501-5 QC Sample: L1745989-01 Client ID: VP001						
Dichlorodifluoromethane	0.324	0.410	ppbV	23		25
Chloromethane	ND	ND	ppbV	NC		25
Freon-114	ND	ND	ppbV	NC		25
Vinyl chloride	ND	ND	ppbV	NC		25
1,3-Butadiene	4.97	5.50	ppbV	10		25
Bromomethane	ND	ND	ppbV	NC		25
Chloroethane	ND	ND	ppbV	NC		25
Ethanol	5.65	5.66	ppbV	0		25
Vinyl bromide	ND	ND	ppbV	NC		25
Acetone	23.3	23.7	ppbV	2		25
Trichlorofluoromethane	0.289	0.323	ppbV	11		25
Isopropanol	ND	ND	ppbV	NC		25
1,1-Dichloroethene	ND	ND	ppbV	NC		25
Tertiary butyl Alcohol	1.11	1.22	ppbV	9		25
Methylene chloride	ND	ND	ppbV	NC		25
3-Chloropropene	ND	ND	ppbV	NC		25
Carbon disulfide	1.41	1.50	ppbV	6		25
Freon-113	ND	ND	ppbV	NC		25
trans-1,2-Dichloroethene	0.339	0.278	ppbV	20		25
1,1-Dichloroethane	ND	ND	ppbV	NC		25
Methyl tert butyl ether	ND	ND	ppbV	NC		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1074501-5 QC Sample: L1745989-01 Client ID: VP001						
2-Butanone	11.0	11.2	ppbV	2		25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC		25
Ethyl Acetate	ND	ND	ppbV	NC		25
Chloroform	0.459	0.494	ppbV	7		25
Tetrahydrofuran	ND	ND	ppbV	NC		25
1,2-Dichloroethane	ND	ND	ppbV	NC		25
n-Hexane	2.19	2.23	ppbV	2		25
1,1,1-Trichloroethane	ND	ND	ppbV	NC		25
Benzene	2.43	2.26	ppbV	7		25
Carbon tetrachloride	ND	ND	ppbV	NC		25
Cyclohexane	0.314	0.301	ppbV	4		25
1,2-Dichloropropane	ND	ND	ppbV	NC		25
Bromodichloromethane	ND	ND	ppbV	NC		25
1,4-Dioxane	ND	ND	ppbV	NC		25
Trichloroethene	ND	ND	ppbV	NC		25
2,2,4-Trimethylpentane	ND	ND	ppbV	NC		25
Heptane	0.961	0.983	ppbV	2		25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC		25
4-Methyl-2-pentanone	ND	ND	ppbV	NC		25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC		25
1,1,2-Trichloroethane	ND	ND	ppbV	NC		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1074501-5 QC Sample: L1745989-01 Client ID: VP001						
Toluene	3.10	3.41	ppbV	10		25
2-Hexanone	1.60	1.72	ppbV	7		25
Dibromochloromethane	ND	ND	ppbV	NC		25
1,2-Dibromoethane	ND	ND	ppbV	NC		25
Tetrachloroethene	5.80	6.72	ppbV	15		25
Chlorobenzene	ND	ND	ppbV	NC		25
Ethylbenzene	0.790	0.926	ppbV	16		25
p/m-Xylene	2.36	2.61	ppbV	10		25
Bromoform	ND	ND	ppbV	NC		25
Styrene	0.384	0.444	ppbV	14		25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC		25
o-Xylene	0.872	1.02	ppbV	16		25
4-Ethyltoluene	0.237	0.268	ppbV	12		25
1,3,5-Trimethylbenzene	0.337	0.372	ppbV	10		25
1,2,4-Trimethylbenzene	0.933	1.05	ppbV	12		25
Benzyl chloride	ND	ND	ppbV	NC		25
1,3-Dichlorobenzene	ND	ND	ppbV	NC		25
1,4-Dichlorobenzene	ND	ND	ppbV	NC		25
1,2-Dichlorobenzene	ND	ND	ppbV	NC		25
1,2,4-Trichlorobenzene	ND	ND	ppbV	NC		25
Hexachlorobutadiene	ND	ND	ppbV	NC		25

Project Name:

Lab Number: L1745989

Project Number: BBU1702

Report Date: 12/20/17

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controler Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1745989-01	VP001	0258	Flow 4	12/08/17	254947		-	-	-	Pass	17.3	16.0	8
L1745989-01	VP001	194	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-5.4	-	-	-	-
L1745989-02	VP002	0235	Flow 5	12/08/17	254947		-	-	-	Pass	18.0	18.2	1
L1745989-02	VP002	2246	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-5.3	-	-	-	-
L1745989-03	VP003	0216	Flow 3	12/08/17	254947		-	-	-	Pass	17.9	18.6	4
L1745989-03	VP003	2241	2.7L Can	12/08/17	254947	L1744737-02	Pass	-29.2	-4.6	-	-	-	-
L1745989-04	VP004	0972	Flow 3	12/08/17	254947		-	-	-	Pass	18.0	18.1	1
L1745989-04	VP004	2026	2.7L Can	12/08/17	254947	L1744737-01	Pass	-30.0	-6.3	-	-	-	-
L1745989-05	VP005	0959	Flow 5	12/08/17	254947		-	-	-	Pass	18.0	17.9	1
L1745989-05	VP005	182	2.7L Can	12/08/17	254947	L1744737-01	Pass	-30.0	-3.3	-	-	-	-
L1745989-06	VP006	0543	Flow 5	12/08/17	254947		-	-	-	Pass	18.0	18.1	1
L1745989-06	VP006	347	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-5.1	-	-	-	-
L1745989-07	VP007	0277	Flow 4	12/08/17	254947		-	-	-	Pass	18.0	39.1	74
L1745989-07	VP007	2297	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-3.7	-	-	-	-
L1745989-08	VP008	0973	Flow 3	12/08/17	254947		-	-	-	Pass	18.0	18.2	1

Project Name:

Lab Number: L1745989

Project Number: BBU1702

Report Date: 12/20/17

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controler Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1745989-08	VP008	539	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	0.0	-	-	-	-
L1745989-09	AA001	0575	Flow 4	12/08/17	254947		-	-	-	Pass	17.9	19.1	6
L1745989-09	AA001	346	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-3.0	-	-	-	-

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/06/17 15:48
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Diisopropyl ether	ND	0.200	--	ND	0.836	--		1
tert-Butyl Ethyl Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
tert-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
4-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

	Results	**Qualifier**	**Units**	**RDL**	**Dilution Factor**
Tentatively Identified Compounds					
No Tentatively Identified Compounds					

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	90		60-140
Bromochloromethane	96		60-140
chlorobenzene-d5	91		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/06/17 15:48
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.100	--	ND	0.264	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
Freon-113	ND	0.050	--	ND	0.383	--		1
Halothane	ND	0.050	--	ND	0.404	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethybenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	90		60-140
bromochloromethane	93		60-140
chlorobenzene-d5	92		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/06/17 16:20
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Diisopropyl ether	ND	0.200	--	ND	0.836	--		1
tert-Butyl Ethyl Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
tert-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
4-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

	Results	**Qualifier**	**Units**	**RDL**	**Dilution Factor**
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	87		60-140
Bromochloromethane	94		60-140
chlorobenzene-d5	88		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/06/17 16:20
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.100	--	ND	0.264	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
Freon-113	ND	0.050	--	ND	0.383	--		1
Halothane	ND	0.050	--	ND	0.404	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethybenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	88		60-140
bromochloromethane	92		60-140
chlorobenzene-d5	90		60-140

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
NA	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1745989-01A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-02A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-03A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-04A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-05A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-06A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-07A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-08A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-09A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)

*Values in parentheses indicate holding time in days

Project Name:	Not Specified	**Lab Number:**	L1745989
Project Number:	BBU1702	**Report Date:**	12/20/17

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Report Format: Data Usability Report

Project Name:	Not Specified	**Lab Number:**	L1745989
Project Number:	BBU1702	**Report Date:**	12/20/17

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

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

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

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

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

REFERENCES

48 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

AIR ANALYSIS

PAGE 1 OF 1

ALPHA ANALYTICAL — CHAIN OF CUSTODY

320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 12/14/17

ALPHA Job #: L1745989

Client Information

Client: PWGC
Address: 630 Johnson Ave
Bohemia, NY 11716
Phone: 631-589-6353
Fax:
Email: thomasm@pwgrosser.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name:
Project Location: 718 E. 212th St, Bronx
Project #: BBU1702
Project Manager: Thomas Melia
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: Time:

Report Information - Data Deliverables

☐ FAX
☒ ADEx
Criteria Checker:
(Default based on Regulatory Criteria Indicated)
Other Formats:
☐ EMAIL (standard pdf report)
☐ Additional Deliverables:
Report to: (if different than Project Manager)

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed	Program	Res / Comm

Other Project Specific Requirements/Comments:

Project-Specific Target Compound List: ☐

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	COLLECTION End Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	ID Can	ID - Flow Controller	TO-15	TO-15 SIM	APH Subset Non-petroleum HCs ☐	Fixed Gases	Sulfides & Mercaptans by TO-15	Sample Comments (i.e. PID)
45989.01	VP001	12-12-17	0810	1024	-29.4	-6.1	SV	KC	2.7L	194	0258	X					
.02	VP002		0829	1031	-29.74	-5.75				2246	0235						
.03	VP003		0835	1023	-28.85	-5.16				0216	2241						CanID and flow control ID are swapped once
.04	VP004		0843	1043	-29.6	-6.92				2026	0972						
.05	VP005		0852	1052	-29.81	-4.14				182	0959						
.06	VP006		0902	1100	-29.53	-5.65				347	0543						
.07	VP007		0856	0954	-29.16	-4.32				2297	0277						
.08	VP008		0917	1030	-30.22	0				539	0973						
.09	AA001		0827	1032	-29.38	-3.77	AA			346	0575						

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type: CS

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time:
	12/13/17 1500		12/13/17
	12/13/17 2047		12/14/17 0200

Form No: 101-02 Rev: (25-Sep-15)

ANALYTICAL REPORT

Lab Number:	L1745989
Client:	P. W. Grosser 630 Johnson Avenue Suite 7 Bohemia, NY 11716
ATTN:	Thomas Melia
Phone:	(631) 589-6353
Project Name:	Not Specified
Project Number:	BBU1702
Report Date:	12/20/17

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), NJ NELAP (MA015), CT (PH-0141), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-13-00067), USFWS (Permit #LE2069641).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1745989-01	VP001	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:24	12/13/17
L1745989-02	VP002	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:31	12/13/17
L1745989-03	VP003	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:23	12/13/17
L1745989-04	VP004	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:43	12/13/17
L1745989-05	VP005	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:52	12/13/17
L1745989-06	VP006	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 11:00	12/13/17
L1745989-07	VP007	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 09:54	12/13/17
L1745989-08	VP008	SOIL_VAPOR	718 E. 212TH ST., BRONX, NY	12/12/17 10:30	12/13/17
L1745989-09	AA001	AIR	718 E. 212TH ST., BRONX, NY	12/12/17 10:32	12/13/17

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name:	Not Specified	**Lab Number:**	L1745989
Project Number:	BBU1702	**Report Date:**	12/20/17

Case Narrative (continued)

Volatile Organics in Air

Canisters were released from the laboratory on December 8, 2017. The canister certification results are provided as an addendum.

L1745989-05 The presence of Acetone could not be determined in this sample due to a non-target compound interfering with the identification and quantification of this compound.

The WG1074501-3 LCS recoveries for benzyl chloride (134%), 1,2,4-trichlorobenzene (141%) and hexachlorobutadiene (143%) are above the upper 130% acceptance limit. All samples associated with this LCS do not have reportable amounts of these analytes.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Christopher J. Anderson

Title: Technical Director/Representative Date: 12/20/17

AIR

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-01
Client ID: VP001
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 21:24
Analyst: RY

Date Collected: 12/12/17 10:24
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.324	0.200	--	1.60	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	4.97	0.200	--	11.0	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	5.65	5.00	--	10.6	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	23.3	1.00	--	55.3	2.38	--		1
Trichlorofluoromethane	0.289	0.200	--	1.62	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	1.11	0.500	--	3.36	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	1.41	0.200	--	4.39	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.339	0.200	--	1.34	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	11.0	0.500	--	32.4	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-01 Date Collected: 12/12/17 10:24
Client ID: VP001 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.459	0.200	--	2.24	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.19	0.200	--	7.72	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	2.43	0.200	--	7.76	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	0.314	0.200	--	1.08	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	0.961	0.200	--	3.94	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	3.10	0.200	--	11.7	0.754	--		1
2-Hexanone	1.60	0.200	--	6.56	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	5.80	0.200	--	39.3	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.790	0.200	--	3.43	0.869	--		1
p/m-Xylene	2.36	0.400	--	10.3	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.384	0.200	--	1.63	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-01 Date Collected: 12/12/17 10:24

Client ID: VP001 Date Received: 12/13/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.872	0.200	--	3.79	0.869	--		1
4-Ethyltoluene	0.237	0.200	--	1.17	0.983	--		1
1,3,5-Trimethylbenzene	0.337	0.200	--	1.66	0.983	--		1
1,2,4-Trimethylbenzene	0.933	0.200	--	4.59	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	75		60-140
Bromochloromethane	83		60-140
chlorobenzene-d5	88		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-02
Client ID: VP002
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 22:34
Analyst: RY

Date Collected: 12/12/17 10:31
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.436	0.200	--	2.16	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	4.51	0.200	--	9.98	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	33.6	1.00	--	79.8	2.38	--		1
Trichlorofluoromethane	0.227	0.200	--	1.28	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	2.03	0.500	--	6.15	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	2.52	0.200	--	7.85	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.454	0.200	--	1.80	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	12.0	0.500	--	35.4	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-02 Date Collected: 12/12/17 10:31
Client ID: VP002 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.889	0.200	--	4.34	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.80	0.200	--	9.87	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	2.68	0.200	--	8.56	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	0.360	0.200	--	1.24	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	0.994	0.200	--	4.07	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	4.64	0.200	--	17.5	0.754	--		1
2-Hexanone	1.72	0.200	--	7.05	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	1.26	0.200	--	8.54	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.937	0.200	--	4.07	0.869	--		1
p/m-Xylene	2.80	0.400	--	12.2	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.474	0.200	--	2.02	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-02 Date Collected: 12/12/17 10:31
Client ID: VP002 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.997	0.200	--	4.33	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.464	0.200	--	2.28	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	106		60-140
Bromochloromethane	96		60-140
chlorobenzene-d5	101		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-03
Client ID: VP003
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 23:09
Analyst: RY

Date Collected: 12/12/17 10:23
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.217	0.200	--	1.07	0.989	--		1
Chloromethane	0.218	0.200	--	0.450	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	4.23	0.200	--	9.36	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	6.92	5.00	--	13.0	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	59.6	1.00	--	142	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	0.996	0.500	--	3.02	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	1.96	0.200	--	6.10	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.263	0.200	--	1.04	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	14.5	0.500	--	42.8	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-03 Date Collected: 12/12/17 10:23
Client ID: VP003 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.461	0.200	--	2.25	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.15	0.200	--	7.58	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	1.83	0.200	--	5.85	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	2.99	0.200	--	10.3	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	0.577	0.200	--	2.36	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	1.88	0.200	--	7.08	0.754	--		1
2-Hexanone	1.72	0.200	--	7.05	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.458	0.200	--	1.99	0.869	--		1
p/m-Xylene	1.54	0.400	--	6.69	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.382	0.200	--	1.63	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-03 Date Collected: 12/12/17 10:23
Client ID: VP003 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.574	0.200	--	2.49	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.358	0.200	--	1.76	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	116		60-140
Bromochloromethane	105		60-140
chlorobenzene-d5	106		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID:	L1745989-04	Date Collected:	12/12/17 10:43
Client ID:	VP004	Date Received:	12/13/17
Sample Location:	718 E. 212TH ST., BRONX, NY	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Anaytical Method:	48,TO-15		
Analytical Date:	12/19/17 23:43		
Analyst:	RY		

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.341	0.200	--	1.69	0.989	--		1
Chloromethane	0.580	0.200	--	1.20	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	27.3	5.00	--	51.4	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	121	1.00	--	287	2.38	--		1
Trichlorofluoromethane	0.222	0.200	--	1.25	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	0.657	0.500	--	1.99	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	21.2	0.500	--	62.5	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	0.900	0.500	--	3.24	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-04 Date Collected: 12/12/17 10:43
Client ID: VP004 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.260	0.200	--	0.831	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.689	0.200	--	2.60	0.754	--		1
2-Hexanone	2.16	0.200	--	8.85	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.850	0.200	--	3.69	0.869	--		1
p/m-Xylene	0.992	0.400	--	4.31	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	1.01	0.200	--	4.30	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-04 Date Collected: 12/12/17 10:43

Client ID: VP004 Date Received: 12/13/17

Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.361	0.200	--	1.57	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.349	0.200	--	1.72	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	109		60-140
Bromochloromethane	105		60-140
chlorobenzene-d5	105		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-05
Client ID: VP005
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/20/17 00:18
Analyst: RY

Date Collected: 12/12/17 10:52
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.229	0.200	--	1.13	0.989	--		1
Chloromethane	0.287	0.200	--	0.593	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	1.84	0.200	--	4.07	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	2.58	0.200	--	8.03	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	3.80	0.500	--	11.2	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-05 Date Collected: 12/12/17 10:52
Client ID: VP005 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.471	0.200	--	2.30	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	2.85	0.200	--	10.0	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	1.63	0.200	--	5.21	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	0.931	0.200	--	3.20	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	1.22	0.200	--	5.00	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	1.25	0.200	--	4.71	0.754	--		1
2-Hexanone	0.291	0.200	--	1.19	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.373	0.200	--	1.62	0.869	--		1
p/m-Xylene	1.53	0.400	--	6.65	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.391	0.200	--	1.66	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-05 Date Collected: 12/12/17 10:52
Client ID: VP005 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.636	0.200	--	2.76	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.446	0.200	--	2.19	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	111		60-140
Bromochloromethane	105		60-140
chlorobenzene-d5	108		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID:	L1745989-06	Date Collected:	12/12/17 11:00
Client ID:	VP006	Date Received:	12/13/17
Sample Location:	718 E. 212TH ST., BRONX, NY	Field Prep:	Not Specified
Matrix:	Soil_Vapor		
Anaytical Method:	48,TO-15		
Analytical Date:	12/20/17 00:53		
Analyst:	RY		

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	0.236	0.200	--	0.487	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	22.8	0.200	--	50.4	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	65.4	1.00	--	155	2.38	--		1
Trichlorofluoromethane	0.284	0.200	--	1.60	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	1.00	0.500	--	3.03	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	32.7	0.200	--	102	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	0.752	0.200	--	2.98	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	19.0	0.500	--	56.0	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-06 Date Collected: 12/12/17 11:00
Client ID: VP006 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.736	0.200	--	3.59	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	11.6	0.200	--	40.9	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	2.70	0.200	--	8.63	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	1.99	0.200	--	6.85	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	3.33	0.200	--	13.6	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	4.64	0.200	--	17.5	0.754	--		1
2-Hexanone	2.00	0.200	--	8.20	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	0.519	0.200	--	3.52	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.887	0.200	--	3.85	0.869	--		1
p/m-Xylene	2.54	0.400	--	11.0	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.510	0.200	--	2.17	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-06 Date Collected: 12/12/17 11:00
Client ID: VP006 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.921	0.200	--	4.00	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.452	0.200	--	2.22	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	114		60-140
Bromochloromethane	110		60-140
chlorobenzene-d5	118		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-07
Client ID: VP007
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/20/17 01:27
Analyst: RY

Date Collected: 12/12/17 09:54
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.363	0.200	--	1.79	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	20.1	1.00	--	47.7	2.38	--		1
Trichlorofluoromethane	0.228	0.200	--	1.28	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	1.34	0.500	--	4.06	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	0.674	0.200	--	2.10	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	3.92	0.500	--	11.6	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-07 Date Collected: 12/12/17 09:54
Client ID: VP007 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	0.488	0.200	--	2.38	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.394	0.200	--	1.26	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.732	0.200	--	2.76	0.754	--		1
2-Hexanone	0.336	0.200	--	1.38	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	2.79	0.200	--	18.9	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.305	0.200	--	1.32	0.869	--		1
p/m-Xylene	1.36	0.400	--	5.91	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	0.286	0.200	--	1.22	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-07 Date Collected: 12/12/17 09:54
Client ID: VP007 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.463	0.200	--	2.01	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.461	0.200	--	2.27	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	106		60-140
Bromochloromethane	112		60-140
chlorobenzene-d5	113		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-08
Client ID: VP008
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/20/17 02:02
Analyst: RY

Date Collected: 12/12/17 10:30
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.352	0.200	--	1.74	0.989	--		1
Chloromethane	0.362	0.200	--	0.748	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	26.8	1.00	--	63.7	2.38	--		1
Trichlorofluoromethane	0.217	0.200	--	1.22	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	5.34	0.500	--	15.7	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-08 Date Collected: 12/12/17 10:30
Client ID: VP008 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.215	0.200	--	0.687	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.441	0.200	--	1.66	0.754	--		1
2-Hexanone	0.314	0.200	--	1.29	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	0.521	0.400	--	2.26	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-08 Date Collected: 12/12/17 10:30
Client ID: VP008 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	0.200	0.200	--	0.869	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	107		60-140
Bromochloromethane	114		60-140
chlorobenzene-d5	113		60-140

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-09
Client ID: AA001
Sample Location: 718 E. 212TH ST., BRONX, NY
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/19/17 16:46
Analyst: RY

Date Collected: 12/12/17 10:32
Date Received: 12/13/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Dichlorodifluoromethane	0.283	0.200	--	1.40	0.989	--		1
Chloromethane	0.523	0.200	--	1.08	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	2.04	1.00	--	4.85	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	0.577	0.500	--	1.42	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-09 Date Collected: 12/12/17 10:32
Client ID: AA001 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	0.544	0.200	--	1.74	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	0.215	0.200	--	0.810	0.754	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	0.575	0.200	--	2.50	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1

Project Name: ***Lab Number:*** L1745989

Project Number: BBU1702 ***Report Date:*** 12/20/17

SAMPLE RESULTS

Lab ID: L1745989-09 Date Collected: 12/12/17 10:32
Client ID: AA001 Date Received: 12/13/17
Sample Location: 718 E. 212TH ST., BRONX, NY Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	0.376	0.200	--	1.85	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	78		60-140
Bromochloromethane	93		60-140
chlorobenzene-d5	86		60-140

Project Name: Not Specified
Project Number: BBU1702
Lab Number: L1745989
Report Date: 12/20/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/19/17 14:37

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-09 Batch: WG1074501-4								
Propylene	ND	0.500	--	ND	0.861	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1

Project Name: Not Specified
Project Number: BBU1702
Lab Number: L1745989
Report Date: 12/20/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/19/17 14:37

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-09 Batch: WG1074501-4								
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1

Project Name: Not Specified
Project Number: BBU1702
Lab Number: L1745989
Report Date: 12/20/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/19/17 14:37

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab for sample(s): 01-09 Batch: WG1074501-4								
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					
No Tentatively Identified Compounds					

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
Chlorodifluoromethane	84		-		70-130	-		
Propylene	90		-		70-130	-		
Propane	**63**	Q	-		70-130	-		
Dichlorodifluoromethane	70		-		70-130	-		
Chloromethane	92		-		70-130	-		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	103		-		70-130	-		
Methanol	79		-		70-130	-		
Vinyl chloride	96		-		70-130	-		
1,3-Butadiene	98		-		70-130	-		
Butane	81		-		70-130	-		
Bromomethane	104		-		70-130	-		
Chloroethane	99		-		70-130	-		
Ethyl Alcohol	88		-		70-130	-		
Dichlorofluoromethane	93		-		70-130	-		
Vinyl bromide	107		-		70-130	-		
Acrolein	92		-		70-130	-		
Acetone	101		-		70-130	-		
Acetonitrile	83		-		70-130	-		
Trichlorofluoromethane	113		-		70-130	-		
iso-Propyl Alcohol	101		-		70-130	-		
Acrylonitrile	92		-		70-130	-		
Pentane	87		-		70-130	-		
Ethyl ether	88		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
1,1-Dichloroethene	100		-		70-130	-		
tert-Butyl Alcohol	97		-		70-130	-		
Methylene chloride	103		-		70-130	-		
3-Chloropropene	101		-		70-130	-		
Carbon disulfide	97		-		70-130	-		
1,1,2-Trichloro-1,2,2-Trifluoroethane	105		-		70-130	-		
trans-1,2-Dichloroethene	96		-		70-130	-		
1,1-Dichloroethane	100		-		70-130	-		
Methyl tert butyl ether	98		-		70-130	-		
Vinyl acetate	122		-		70-130	-		
2-Butanone	96		-		70-130	-		
cis-1,2-Dichloroethene	96		-		70-130	-		
Ethyl Acetate	115		-		70-130	-		
Chloroform	109		-		70-130	-		
Tetrahydrofuran	95		-		70-130	-		
2,2-Dichloropropane	103		-		70-130	-		
1,2-Dichloroethane	102		-		70-130	-		
n-Hexane	93		-		70-130	-		
Isopropyl Ether	86		-		70-130	-		
Ethyl-Tert-Butyl-Ether	84		-		70-130	-		
1,1,1-Trichloroethane	102		-		70-130	-		
1,1-Dichloropropene	84		-		70-130	-		
Benzene	92		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
Carbon tetrachloride	105		-		70-130	-		
Cyclohexane	87		-		70-130	-		
Tertiary-Amyl Methyl Ether	89		-		70-130	-		
Dibromomethane	89		-		70-130	-		
1,2-Dichloropropane	92		-		70-130	-		
Bromodichloromethane	100		-		70-130	-		
1,4-Dioxane	94		-		70-130	-		
Trichloroethene	100		-		70-130	-		
2,2,4-Trimethylpentane	96		-		70-130	-		
Methyl Methacrylate	94		-		70-130	-		
Heptane	92		-		70-130	-		
cis-1,3-Dichloropropene	100		-		70-130	-		
4-Methyl-2-pentanone	96		-		70-130	-		
trans-1,3-Dichloropropene	87		-		70-130	-		
1,1,2-Trichloroethane	99		-		70-130	-		
Toluene	106		-		70-130	-		
1,3-Dichloropropane	100		-		70-130	-		
2-Hexanone	105		-		70-130	-		
Dibromochloromethane	121		-		70-130	-		
1,2-Dibromoethane	113		-		70-130	-		
Butyl Acetate	101		-		70-130	-		
Octane	98		-		70-130	-		
Tetrachloroethene	116		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: Not Specified

Project Number: BBU1702

Lab Number: L1745989

Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
1,1,1,2-Tetrachloroethane	110		-		70-130	-		
Chlorobenzene	114		-		70-130	-		
Ethylbenzene	108		-		70-130	-		
p/m-Xylene	112		-		70-130	-		
Bromoform	128		-		70-130	-		
Styrene	112		-		70-130	-		
1,1,2,2-Tetrachloroethane	118		-		70-130	-		
o-Xylene	116		-		70-130	-		
1,2,3-Trichloropropane	106		-		70-130	-		
Nonane (C9)	102		-		70-130	-		
Isopropylbenzene	112		-		70-130	-		
Bromobenzene	104		-		70-130	-		
o-Chlorotoluene	110		-		70-130	-		
n-Propylbenzene	114		-		70-130	-		
p-Chlorotoluene	105		-		70-130	-		
4-Ethyltoluene	115		-		70-130	-		
1,3,5-Trimethylbenzene	120		-		70-130	-		
tert-Butylbenzene	115		-		70-130	-		
1,2,4-Trimethylbenzene	124		-		70-130	-		
Decane (C10)	110		-		70-130	-		
Benzyl chloride	**134**	Q	-		70-130	-		
1,3-Dichlorobenzene	126		-		70-130	-		
1,4-Dichlorobenzene	124		-		70-130	-		

Lab Control Sample Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 Batch: WG1074501-3								
sec-Butylbenzene	116		-		70-130	-		
p-Isopropyltoluene	109		-		70-130	-		
1,2-Dichlorobenzene	128		-		70-130	-		
n-Butylbenzene	119		-		70-130	-		
1,2-Dibromo-3-chloropropane	109		-		70-130	-		
Undecane	114		-		70-130	-		
Dodecane (C12)	113		-		70-130	-		
1,2,4-Trichlorobenzene	**141**	Q	-		70-130	-		
Naphthalene	116		-		70-130	-		
1,2,3-Trichlorobenzene	124		-		70-130	-		
Hexachlorobutadiene	**143**	Q	-		70-130	-		

Lab Duplicate Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1074501-5 QC Sample: L1745989-01 Client ID: VP001						
Dichlorodifluoromethane	0.324	0.410	ppbV	23		25
Chloromethane	ND	ND	ppbV	NC		25
Freon-114	ND	ND	ppbV	NC		25
Vinyl chloride	ND	ND	ppbV	NC		25
1,3-Butadiene	4.97	5.50	ppbV	10		25
Bromomethane	ND	ND	ppbV	NC		25
Chloroethane	ND	ND	ppbV	NC		25
Ethanol	5.65	5.66	ppbV	0		25
Vinyl bromide	ND	ND	ppbV	NC		25
Acetone	23.3	23.7	ppbV	2		25
Trichlorofluoromethane	0.289	0.323	ppbV	11		25
Isopropanol	ND	ND	ppbV	NC		25
1,1-Dichloroethene	ND	ND	ppbV	NC		25
Tertiary butyl Alcohol	1.11	1.22	ppbV	9		25
Methylene chloride	ND	ND	ppbV	NC		25
3-Chloropropene	ND	ND	ppbV	NC		25
Carbon disulfide	1.41	1.50	ppbV	6		25
Freon-113	ND	ND	ppbV	NC		25
trans-1,2-Dichloroethene	0.339	0.278	ppbV	20		25
1,1-Dichloroethane	ND	ND	ppbV	NC		25
Methyl tert butyl ether	ND	ND	ppbV	NC		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1074501-5 QC Sample: L1745989-01 Client ID: VP001						
2-Butanone	11.0	11.2	ppbV	2		25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC		25
Ethyl Acetate	ND	ND	ppbV	NC		25
Chloroform	0.459	0.494	ppbV	7		25
Tetrahydrofuran	ND	ND	ppbV	NC		25
1,2-Dichloroethane	ND	ND	ppbV	NC		25
n-Hexane	2.19	2.23	ppbV	2		25
1,1,1-Trichloroethane	ND	ND	ppbV	NC		25
Benzene	2.43	2.26	ppbV	7		25
Carbon tetrachloride	ND	ND	ppbV	NC		25
Cyclohexane	0.314	0.301	ppbV	4		25
1,2-Dichloropropane	ND	ND	ppbV	NC		25
Bromodichloromethane	ND	ND	ppbV	NC		25
1,4-Dioxane	ND	ND	ppbV	NC		25
Trichloroethene	ND	ND	ppbV	NC		25
2,2,4-Trimethylpentane	ND	ND	ppbV	NC		25
Heptane	0.961	0.983	ppbV	2		25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC		25
4-Methyl-2-pentanone	ND	ND	ppbV	NC		25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC		25
1,1,2-Trichloroethane	ND	ND	ppbV	NC		25

Lab Duplicate Analysis
Batch Quality Control

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-09 QC Batch ID: WG1074501-5 QC Sample: L1745989-01 Client ID: VP001						
Toluene	3.10	3.41	ppbV	10		25
2-Hexanone	1.60	1.72	ppbV	7		25
Dibromochloromethane	ND	ND	ppbV	NC		25
1,2-Dibromoethane	ND	ND	ppbV	NC		25
Tetrachloroethene	5.80	6.72	ppbV	15		25
Chlorobenzene	ND	ND	ppbV	NC		25
Ethylbenzene	0.790	0.926	ppbV	16		25
p/m-Xylene	2.36	2.61	ppbV	10		25
Bromoform	ND	ND	ppbV	NC		25
Styrene	0.384	0.444	ppbV	14		25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC		25
o-Xylene	0.872	1.02	ppbV	16		25
4-Ethyltoluene	0.237	0.268	ppbV	12		25
1,3,5-Trimethylbenzene	0.337	0.372	ppbV	10		25
1,2,4-Trimethylbenzene	0.933	1.05	ppbV	12		25
Benzyl chloride	ND	ND	ppbV	NC		25
1,3-Dichlorobenzene	ND	ND	ppbV	NC		25
1,4-Dichlorobenzene	ND	ND	ppbV	NC		25
1,2-Dichlorobenzene	ND	ND	ppbV	NC		25
1,2,4-Trichlorobenzene	ND	ND	ppbV	NC		25
Hexachlorobutadiene	ND	ND	ppbV	NC		25

Project Name:

Lab Number: L1745989

Project Number: BBU1702

Report Date: 12/20/17

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controler Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1745989-01	VP001	0258	Flow 4	12/08/17	254947		-	-	-	Pass	17.3	16.0	8
L1745989-01	VP001	194	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-5.4	-	-	-	-
L1745989-02	VP002	0235	Flow 5	12/08/17	254947		-	-	-	Pass	18.0	18.2	1
L1745989-02	VP002	2246	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-5.3	-	-	-	-
L1745989-03	VP003	0216	Flow 3	12/08/17	254947		-	-	-	Pass	17.9	18.6	4
L1745989-03	VP003	2241	2.7L Can	12/08/17	254947	L1744737-02	Pass	-29.2	-4.6	-	-	-	-
L1745989-04	VP004	0972	Flow 3	12/08/17	254947		-	-	-	Pass	18.0	18.1	1
L1745989-04	VP004	2026	2.7L Can	12/08/17	254947	L1744737-01	Pass	-30.0	-6.3	-	-	-	-
L1745989-05	VP005	0959	Flow 5	12/08/17	254947		-	-	-	Pass	18.0	17.9	1
L1745989-05	VP005	182	2.7L Can	12/08/17	254947	L1744737-01	Pass	-30.0	-3.3	-	-	-	-
L1745989-06	VP006	0543	Flow 5	12/08/17	254947		-	-	-	Pass	18.0	18.1	1
L1745989-06	VP006	347	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-5.1	-	-	-	-
L1745989-07	VP007	0277	Flow 4	12/08/17	254947		-	-	-	Pass	18.0	39.1	74
L1745989-07	VP007	2297	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-3.7	-	-	-	-
L1745989-08	VP008	0973	Flow 3	12/08/17	254947		-	-	-	Pass	18.0	18.2	1

Project Name:

Lab Number: L1745989

Project Number: BBU1702

Report Date: 12/20/17

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controler Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1745989-08	VP008	539	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	0.0	-	-	-	-
L1745989-09	AA001	0575	Flow 4	12/08/17	254947		-	-	-	Pass	17.9	19.1	6
L1745989-09	AA001	346	2.7L Can	12/08/17	254947	L1744737-02	Pass	-30.0	-3.0	-	-	-	-

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/06/17 15:48
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Diisopropyl ether	ND	0.200	--	ND	0.836	--		1
tert-Butyl Ethyl Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
tert-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
4-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

	Results	**Qualifier**	**Units**	**RDL**	**Dilution Factor**
Tentatively Identified Compounds					
No Tentatively Identified Compounds					

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	90		60-140
Bromochloromethane	96		60-140
chlorobenzene-d5	91		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/06/17 15:48
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.100	--	ND	0.264	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
Freon-113	ND	0.050	--	ND	0.383	--		1
Halothane	ND	0.050	--	ND	0.404	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethybenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-01
Client ID: CAN 177 SHELF 3
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	90		60-140
bromochloromethane	93		60-140
chlorobenzene-d5	92		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/06/17 16:20
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Diisopropyl ether	ND	0.200	--	ND	0.836	--		1
tert-Butyl Ethyl Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
tert-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
4-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

	Results	**Qualifier**	**Units**	**RDL**	**Dilution Factor**
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	87		60-140
Bromochloromethane	94		60-140
chlorobenzene-d5	88		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/06/17 16:20
Analyst: RY

Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

Parameter	ppbV Results	ppbV RL	ppbV MDL	ug/m3 Results	ug/m3 RL	ug/m3 MDL	Qualifier	Dilution Factor
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.100	--	ND	0.264	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
Freon-113	ND	0.050	--	ND	0.383	--		1
Halothane	ND	0.050	--	ND	0.404	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethybenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1744737
Report Date: 12/20/17

Air Canister Certification Results

Lab ID: L1744737-02
Client ID: CAN 401 SHELF 9
Sample Location:
Date Collected: 12/05/17 16:00
Date Received: 12/06/17
Field Prep: Not Specified

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-difluorobenzene	88		60-140
bromochloromethane	92		60-140
chlorobenzene-d5	90		60-140

Project Name: Not Specified
Project Number: BBU1702

Lab Number: L1745989
Report Date: 12/20/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
NA	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1745989-01A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-02A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-03A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-04A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-05A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-06A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-07A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-08A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)
L1745989-09A	Canister - 2.7 Liter	NA	NA			Y	Absent		TO15-LL(30)

*Values in parentheses indicate holding time in days

Project Name:	Not Specified	**Lab Number:**	L1745989
Project Number:	BBU1702	**Report Date:**	12/20/17

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Report Format: Data Usability Report

Project Name:	Not Specified	**Lab Number:**	L1745989
Project Number:	BBU1702	**Report Date:**	12/20/17

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

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

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

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

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the reporting limit (RL) for the sample.

Report Format: Data Usability Report

REFERENCES

48 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

AIR ANALYSIS

PAGE 1 OF 1

ALPHA ANALYTICAL — CHAIN OF CUSTODY

320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 12/14/17

ALPHA Job #: L1745989

Client Information

Client: PWGC
Address: 630 Johnson Ave
Bohemia, NY 11716
Phone: 631-589-6353
Fax:
Email: thomasm@pwgrosser.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name:
Project Location: 718 E. 212th St, Bronx
Project #: BBU1702
Project Manager: Thomas Melia
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)

Date Due: Time:

Report Information - Data Deliverables

☐ FAX
☒ ADEx
Criteria Checker:
(Default based on Regulatory Criteria Indicated)
Other Formats:
☐ EMAIL (standard pdf report)
☐ Additional Deliverables:
Report to: (if different than Project Manager)

Billing Information

☒ Same as Client info PO #:

Regulatory Requirements/Report Limits

State/Fed	Program	Res / Comm

Other Project Specific Requirements/Comments:

Project-Specific Target Compound List: ☐

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	COLLECTION End Date	Start Time	End Time	Initial Vacuum	Final Vacuum	Sample Matrix*	Sampler's Initials	Can Size	ID Can	ID - Flow Controller	TO-15	TO-15 SIM	APH Subset Non-petroleum HCs ☐	Fixed Gases	Sulfides & Mercaptans by TO-15	Sample Comments (i.e. PID)
45989.01	VP001	12-12-17	0810	1024	-29.4	-6.1	SV	KC	2.7L	194	0258	X					
.02	VP002		0829	1031	-29.74	-5.75				2246	0235						
.03	VP003		0835	1023	-28.85	-5.16				0216	2241						CanID and flow control ID are swapped once
.04	VP004		0843	1043	-29.6	-6.92				2026	0972						
.05	VP005		0852	1052	-29.81	-4.14				182	0959						
.06	VP006		0902	1100	-29.53	-5.65				347	0543						
.07	VP007		0856	0954	-29.16	-4.32				2297	0277						
.08	VP008		0917	1030	-30.22	0				539	0973						
.09	AA001		0827	1032	-29.38	-3.77	AA			346	0575						

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type: CS

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time:
	12/13/17 1500		12/13/17
	12/13/17 2047		12/14/17 0200

Form No: 101-02 Rev: (25-Sep-15)

ANALYTICAL REPORT

Lab Number:	L1746315
Client:	P. W. Grosser 630 Johnson Avenue Suite 7 Bohemia, NY 11716
ATTN:	Thomas Melia
Phone:	(631) 589-6353
Project Name:	BBU1702
Project Number:	BBU1702
Report Date:	12/26/17

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), NJ NELAP (MA935), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-14-00197).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1746315-01	SB005 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 09:30	12/14/17
L1746315-02	SB005 (3-5)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 09:35	12/14/17
L1746315-03	SB006 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 09:45	12/14/17
L1746315-04	SB006 (7.5-9.5)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 09:50	12/14/17
L1746315-05	SB007 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 10:00	12/14/17
L1746315-06	SB007 (7-9)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 10:05	12/14/17
L1746315-07	SB008 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 10:25	12/14/17
L1746315-08	SB008 (10-12)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 10:30	12/14/17
L1746315-09	SB009 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 10:50	12/14/17
L1746315-10	SB009 (7-9)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 10:55	12/14/17
L1746315-11	SB010 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 11:05	12/14/17
L1746315-12	SB010 (7-9)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 11:10	12/14/17
L1746315-13	SB011 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 11:20	12/14/17
L1746315-14	SB011 (5-7)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 11:25	12/14/17
L1746315-15	SB012 (0-2)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 11:40	12/14/17
L1746315-16	SB012 (6-8)	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 11:45	12/14/17
L1746315-17	DUP002	SOIL	718 E. 212TH STREET, BRONX, NY	12/14/17 00:00	12/14/17
L1746315-18	FIELDBLANK002	WATER	718 E. 212TH STREET, BRONX, NY	12/14/17 12:00	12/14/17
L1746315-19	TRIP BLANK	WATER	718 E. 212TH STREET, BRONX, NY	12/14/17 00:00	12/14/17

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY
For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: BBU1702 **Lab Number:** L1746315
Project Number: BBU1702 **Report Date:** 12/26/17

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Volatile Organics

L1746315-07: The internal standard (IS) responses for fluorobenzene (30%), chlorobenzene-d5 (30%), and 1,4-dichlorobenzene-d4 (28%), and the surrogate recovery for 1,2-dichloroethane-d4 (147%) were outside the acceptance criteria. A second low-level vial was analyzed, but yielded no internal standard recoveries. A high-level analysis was performed, and those results are also reported.

Semivolatile Organics

The WG1075523-2/-3 LCS/LCSD recoveries, associated with L1746315-14 through -17, are below the acceptance criteria for benzoic acid (0%/0%); however, it has been identified as a "difficult" analyte. The results of the associated samples are reported.

The WG1075347-4/-5 MS/MSD recoveries, performed on L1746315-03, are below the acceptance criteria for 2,4-dinitrophenol (0%/0%), 4,6-dinitro-o-cresol (MSD 0%), and benzoic acid (0%/0%) due to the concentrations of these compounds falling below the reported detection limits.

Pesticides

L1746315-03: The surrogate recoveries are outside the acceptance criteria for decachlorobiphenyl (173%/174%); however, the sample was not re-extracted due to coelution with obvious interferences.

Total Metals

L1746315-01 through -17: The sample has elevated detection limits for all elements, with the exception of mercury, due to the dilution required by matrix interferences encountered during analysis.

The WG1075214-3 MS recovery, performed on L1746315-03, is outside the acceptance criteria for mercury (159%). A post digestion spike was performed and was within acceptance criteria.

The WG1075583-3/-4 MS/MSD recoveries for aluminum (557%/0%), iron (0%/0%), lead (1090%/0%),

Project Name:	BBU1702	**Lab Number:**	L1746315
Project Number:	BBU1702	**Report Date:**	12/26/17

Case Narrative (continued)

manganese (0%/0%), and zinc (MSD 0%), performed on L1746315-03, do not apply because the sample concentrations are greater than four times the spike amounts added.

The WG1075583-3/-4 MS/MSD recoveries, performed on L1746315-03, are outside the acceptance criteria for arsenic (MSD 74%), barium (MSD 65%), calcium (274%/207%), chromium (MSD 34%), cobalt (MSD 73%), copper (49%/221%), magnesium (MSD 14%), nickel (MSD 72%), thallium (MS 72%), and vanadium (MSD 62%). A post digestion spike was performed and yielded unacceptable recoveries for arsenic (71%), calcium (76%), chromium (68%), cobalt (64%), copper (56%), magnesium (68%), nickel (64%), thallium (65%), and vanadium (77%); all other compounds were within acceptance criteria. This has been attributed to sample matrix.

The WG1075583-3/-4 MS/MSD RPDs, performed on L1746315-03, are above the acceptance criteria for aluminum (36%), chromium (23%), copper (34%), iron (30%), lead (75%), magnesium (24%) and zinc (35%).

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative Date: 12/26/17

ORGANICS

VOLATILES

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01
Client ID: SB005 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 09:30
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/21/17 22:11
Analyst: MV
Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	10	1.7	1
1,1-Dichloroethane	ND		ug/kg	1.5	0.27	1
Chloroform	ND		ug/kg	1.5	0.38	1
Carbon tetrachloride	ND		ug/kg	1.0	0.35	1
1,2-Dichloropropane	ND		ug/kg	3.6	0.23	1
Dibromochloromethane	ND		ug/kg	1.0	0.18	1
1,1,2-Trichloroethane	ND		ug/kg	1.5	0.32	1
Tetrachloroethene	ND		ug/kg	1.0	0.31	1
Chlorobenzene	ND		ug/kg	1.0	0.35	1
Trichlorofluoromethane	ND		ug/kg	5.1	0.42	1
1,2-Dichloroethane	ND		ug/kg	1.0	0.25	1
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.36	1
Bromodichloromethane	ND		ug/kg	1.0	0.31	1
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.21	1
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.23	1
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.21	1
1,1-Dichloropropene	ND		ug/kg	5.1	0.33	1
Bromoform	ND		ug/kg	4.0	0.24	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.30	1
Benzene	0.29	J	ug/kg	1.0	0.20	1
Toluene	ND		ug/kg	1.5	0.20	1
Ethylbenzene	ND		ug/kg	1.0	0.17	1
Chloromethane	ND		ug/kg	5.1	0.44	1
Bromomethane	ND		ug/kg	2.0	0.34	1
Vinyl chloride	ND		ug/kg	2.0	0.32	1
Chloroethane	ND		ug/kg	2.0	0.32	1
1,1-Dichloroethene	ND		ug/kg	1.0	0.38	1
trans-1,2-Dichloroethene	ND		ug/kg	1.5	0.24	1
Trichloroethene	ND		ug/kg	1.0	0.31	1
1,2-Dichlorobenzene	ND		ug/kg	5.1	0.18	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01 Date Collected: 12/14/17 09:30

Client ID: SB005 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.1	0.22	1
1,4-Dichlorobenzene	ND		ug/kg	5.1	0.18	1
Methyl tert butyl ether	ND		ug/kg	2.0	0.16	1
p/m-Xylene	ND		ug/kg	2.0	0.36	1
o-Xylene	ND		ug/kg	2.0	0.34	1
Xylenes, Total	ND		ug/kg	2.0	0.34	1
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.35	1
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.24	1
Dibromomethane	ND		ug/kg	10	0.24	1
Styrene	ND		ug/kg	2.0	0.41	1
Dichlorodifluoromethane	ND		ug/kg	10	0.51	1
Acetone	57		ug/kg	10	2.3	1
Carbon disulfide	ND		ug/kg	10	1.1	1
2-Butanone	6.5	J	ug/kg	10	0.70	1
Vinyl acetate	ND		ug/kg	10	0.16	1
4-Methyl-2-pentanone	ND		ug/kg	10	0.25	1
1,2,3-Trichloropropane	ND		ug/kg	10	0.18	1
2-Hexanone	ND		ug/kg	10	0.68	1
Bromochloromethane	ND		ug/kg	5.1	0.36	1
2,2-Dichloropropane	ND		ug/kg	5.1	0.46	1
1,2-Dibromoethane	ND		ug/kg	4.0	0.20	1
1,3-Dichloropropane	ND		ug/kg	5.1	0.18	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.32	1
Bromobenzene	ND		ug/kg	5.1	0.22	1
n-Butylbenzene	ND		ug/kg	1.0	0.23	1
sec-Butylbenzene	ND		ug/kg	1.0	0.22	1
tert-Butylbenzene	ND		ug/kg	5.1	0.25	1
o-Chlorotoluene	ND		ug/kg	5.1	0.22	1
p-Chlorotoluene	ND		ug/kg	5.1	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.1	0.40	1
Hexachlorobutadiene	ND		ug/kg	5.1	0.35	1
Isopropylbenzene	ND		ug/kg	1.0	0.20	1
p-Isopropyltoluene	ND		ug/kg	1.0	0.20	1
Naphthalene	ND		ug/kg	5.1	0.14	1
Acrylonitrile	ND		ug/kg	10	0.52	1
n-Propylbenzene	ND		ug/kg	1.0	0.22	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.1	0.25	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.1	0.22	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.1	0.16	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01 Date Collected: 12/14/17 09:30

Client ID: SB005 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.24	J	ug/kg	5.1	0.19	1
1,4-Dioxane	ND		ug/kg	40	15.	1
p-Diethylbenzene	ND		ug/kg	4.0	4.0	1
p-Ethyltoluene	ND		ug/kg	4.0	0.24	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.0	0.16	1
Ethyl ether	ND		ug/kg	5.1	0.26	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.1	0.40	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	95		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	105		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02
Client ID: SB005 (3-5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 09:35
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/21/17 22:37
Analyst: MV
Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	9.6	1.6	1
1,1-Dichloroethane	ND		ug/kg	1.4	0.26	1
Chloroform	ND		ug/kg	1.4	0.36	1
Carbon tetrachloride	ND		ug/kg	0.96	0.33	1
1,2-Dichloropropane	ND		ug/kg	3.4	0.22	1
Dibromochloromethane	ND		ug/kg	0.96	0.17	1
1,1,2-Trichloroethane	ND		ug/kg	1.4	0.30	1
Tetrachloroethene	ND		ug/kg	0.96	0.29	1
Chlorobenzene	ND		ug/kg	0.96	0.33	1
Trichlorofluoromethane	ND		ug/kg	4.8	0.40	1
1,2-Dichloroethane	ND		ug/kg	0.96	0.24	1
1,1,1-Trichloroethane	ND		ug/kg	0.96	0.34	1
Bromodichloromethane	ND		ug/kg	0.96	0.30	1
trans-1,3-Dichloropropene	ND		ug/kg	0.96	0.20	1
cis-1,3-Dichloropropene	ND		ug/kg	0.96	0.22	1
1,3-Dichloropropene, Total	ND		ug/kg	0.96	0.20	1
1,1-Dichloropropene	ND		ug/kg	4.8	0.32	1
Bromoform	ND		ug/kg	3.8	0.23	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.96	0.29	1
Benzene	ND		ug/kg	0.96	0.18	1
Toluene	ND		ug/kg	1.4	0.19	1
Ethylbenzene	ND		ug/kg	0.96	0.16	1
Chloromethane	ND		ug/kg	4.8	0.42	1
Bromomethane	ND		ug/kg	1.9	0.32	1
Vinyl chloride	ND		ug/kg	1.9	0.30	1
Chloroethane	ND		ug/kg	1.9	0.30	1
1,1-Dichloroethene	ND		ug/kg	0.96	0.36	1
trans-1,2-Dichloroethene	ND		ug/kg	1.4	0.23	1
Trichloroethene	ND		ug/kg	0.96	0.29	1
1,2-Dichlorobenzene	ND		ug/kg	4.8	0.18	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02 Date Collected: 12/14/17 09:35

Client ID: SB005 (3-5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.8	0.21	1
1,4-Dichlorobenzene	ND		ug/kg	4.8	0.18	1
Methyl tert butyl ether	ND		ug/kg	1.9	0.15	1
p/m-Xylene	ND		ug/kg	1.9	0.34	1
o-Xylene	ND		ug/kg	1.9	0.32	1
Xylenes, Total	ND		ug/kg	1.9	0.32	1
cis-1,2-Dichloroethene	ND		ug/kg	0.96	0.33	1
1,2-Dichloroethene, Total	ND		ug/kg	0.96	0.23	1
Dibromomethane	ND		ug/kg	9.6	0.23	1
Styrene	ND		ug/kg	1.9	0.38	1
Dichlorodifluoromethane	ND		ug/kg	9.6	0.48	1
Acetone	2.7	J	ug/kg	9.6	2.2	1
Carbon disulfide	ND		ug/kg	9.6	1.0	1
2-Butanone	ND		ug/kg	9.6	0.66	1
Vinyl acetate	ND		ug/kg	9.6	0.15	1
4-Methyl-2-pentanone	ND		ug/kg	9.6	0.23	1
1,2,3-Trichloropropane	ND		ug/kg	9.6	0.17	1
2-Hexanone	ND		ug/kg	9.6	0.64	1
Bromochloromethane	ND		ug/kg	4.8	0.34	1
2,2-Dichloropropane	ND		ug/kg	4.8	0.43	1
1,2-Dibromoethane	ND		ug/kg	3.8	0.19	1
1,3-Dichloropropane	ND		ug/kg	4.8	0.18	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.96	0.31	1
Bromobenzene	ND		ug/kg	4.8	0.21	1
n-Butylbenzene	ND		ug/kg	0.96	0.22	1
sec-Butylbenzene	ND		ug/kg	0.96	0.21	1
tert-Butylbenzene	ND		ug/kg	4.8	0.24	1
o-Chlorotoluene	ND		ug/kg	4.8	0.21	1
p-Chlorotoluene	ND		ug/kg	4.8	0.18	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.8	0.38	1
Hexachlorobutadiene	ND		ug/kg	4.8	0.33	1
Isopropylbenzene	ND		ug/kg	0.96	0.19	1
p-Isopropyltoluene	ND		ug/kg	0.96	0.19	1
Naphthalene	ND		ug/kg	4.8	0.13	1
Acrylonitrile	ND		ug/kg	9.6	0.49	1
n-Propylbenzene	ND		ug/kg	0.96	0.21	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.8	0.24	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.8	0.21	1
1,3,5-Trimethylbenzene	ND		ug/kg	4.8	0.15	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02 Date Collected: 12/14/17 09:35

Client ID: SB005 (3-5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	4.8	0.18	1
1,4-Dioxane	ND		ug/kg	38	14.	1
p-Diethylbenzene	ND		ug/kg	3.8	3.8	1
p-Ethyltoluene	ND		ug/kg	3.8	0.22	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	3.8	0.15	1
Ethyl ether	ND		ug/kg	4.8	0.25	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	4.8	0.38	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	92		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	104		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03 Date Collected: 12/14/17 09:45
Client ID: SB006 (0-2) Date Received: 12/14/17
Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/24/17 19:05
Analyst: MV
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	14	2.3	1
1,1-Dichloroethane	ND		ug/kg	2.1	0.37	1
Chloroform	ND		ug/kg	2.1	0.51	1
Carbon tetrachloride	ND		ug/kg	1.4	0.47	1
1,2-Dichloropropane	ND		ug/kg	4.8	0.31	1
Dibromochloromethane	ND		ug/kg	1.4	0.24	1
1,1,2-Trichloroethane	ND		ug/kg	2.1	0.43	1
Tetrachloroethene	ND		ug/kg	1.4	0.42	1
Chlorobenzene	ND		ug/kg	1.4	0.48	1
Trichlorofluoromethane	ND		ug/kg	6.9	0.57	1
1,2-Dichloroethane	ND		ug/kg	1.4	0.34	1
1,1,1-Trichloroethane	ND		ug/kg	1.4	0.48	1
Bromodichloromethane	ND		ug/kg	1.4	0.42	1
trans-1,3-Dichloropropene	ND		ug/kg	1.4	0.29	1
cis-1,3-Dichloropropene	ND		ug/kg	1.4	0.32	1
1,3-Dichloropropene, Total	ND		ug/kg	1.4	0.29	1
1,1-Dichloropropene	ND		ug/kg	6.9	0.45	1
Bromoform	ND		ug/kg	5.5	0.33	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.4	0.41	1
Benzene	ND		ug/kg	1.4	0.26	1
Toluene	ND		ug/kg	2.1	0.27	1
Ethylbenzene	ND		ug/kg	1.4	0.23	1
Chloromethane	ND		ug/kg	6.9	0.60	1
Bromomethane	ND		ug/kg	2.8	0.46	1
Vinyl chloride	ND		ug/kg	2.8	0.43	1
Chloroethane	ND		ug/kg	2.8	0.43	1
1,1-Dichloroethene	ND		ug/kg	1.4	0.51	1
trans-1,2-Dichloroethene	ND		ug/kg	2.1	0.33	1
Trichloroethene	ND		ug/kg	1.4	0.42	1
1,2-Dichlorobenzene	ND		ug/kg	6.9	0.25	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03 Date Collected: 12/14/17 09:45

Client ID: SB006 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.9	0.30	1
1,4-Dichlorobenzene	ND		ug/kg	6.9	0.25	1
Methyl tert butyl ether	ND		ug/kg	2.8	0.21	1
p/m-Xylene	ND		ug/kg	2.8	0.48	1
o-Xylene	ND		ug/kg	2.8	0.46	1
Xylenes, Total	ND		ug/kg	2.8	0.46	1
cis-1,2-Dichloroethene	ND		ug/kg	1.4	0.47	1
1,2-Dichloroethene, Total	ND		ug/kg	1.4	0.33	1
Dibromomethane	ND		ug/kg	14	0.33	1
Styrene	ND		ug/kg	2.8	0.55	1
Dichlorodifluoromethane	ND		ug/kg	14	0.69	1
Acetone	44		ug/kg	14	3.2	1
Carbon disulfide	2.0	J	ug/kg	14	1.5	1
2-Butanone	ND		ug/kg	14	0.95	1
Vinyl acetate	ND		ug/kg	14	0.21	1
4-Methyl-2-pentanone	ND		ug/kg	14	0.34	1
1,2,3-Trichloropropane	ND		ug/kg	14	0.24	1
2-Hexanone	ND		ug/kg	14	0.92	1
Bromochloromethane	ND		ug/kg	6.9	0.49	1
2,2-Dichloropropane	ND		ug/kg	6.9	0.62	1
1,2-Dibromoethane	ND		ug/kg	5.5	0.27	1
1,3-Dichloropropane	ND		ug/kg	6.9	0.25	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.4	0.44	1
Bromobenzene	ND		ug/kg	6.9	0.30	1
n-Butylbenzene	ND		ug/kg	1.4	0.31	1
sec-Butylbenzene	ND		ug/kg	1.4	0.30	1
tert-Butylbenzene	ND		ug/kg	6.9	0.34	1
o-Chlorotoluene	ND		ug/kg	6.9	0.30	1
p-Chlorotoluene	ND		ug/kg	6.9	0.25	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.9	0.54	1
Hexachlorobutadiene	ND		ug/kg	6.9	0.48	1
Isopropylbenzene	ND		ug/kg	1.4	0.27	1
p-Isopropyltoluene	ND		ug/kg	1.4	0.28	1
Naphthalene	ND		ug/kg	6.9	0.19	1
Acrylonitrile	ND		ug/kg	14	0.71	1
n-Propylbenzene	ND		ug/kg	1.4	0.30	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.9	0.34	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.9	0.30	1
1,3,5-Trimethylbenzene	0.26	J	ug/kg	6.9	0.22	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03 Date Collected: 12/14/17 09:45

Client ID: SB006 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.61	J	ug/kg	6.9	0.26	1
1,4-Dioxane	ND		ug/kg	55	20.	1
p-Diethylbenzene	ND		ug/kg	5.5	5.5	1
p-Ethyltoluene	0.63	J	ug/kg	5.5	0.32	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	5.5	0.21	1
Ethyl ether	ND		ug/kg	6.9	0.36	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.9	0.54	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	102		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04
Client ID: SB006 (7.5-9.5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 09:50
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/21/17 23:04
Analyst: MV
Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	1.8	1
1,1-Dichloroethane	ND		ug/kg	1.6	0.29	1
Chloroform	ND		ug/kg	1.6	0.39	1
Carbon tetrachloride	ND		ug/kg	1.1	0.37	1
1,2-Dichloropropane	ND		ug/kg	3.7	0.24	1
Dibromochloromethane	ND		ug/kg	1.1	0.19	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	0.33	1
Tetrachloroethene	ND		ug/kg	1.1	0.32	1
Chlorobenzene	ND		ug/kg	1.1	0.37	1
Trichlorofluoromethane	ND		ug/kg	5.3	0.44	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.26	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	0.37	1
Bromodichloromethane	ND		ug/kg	1.1	0.33	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.22	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	0.25	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	0.22	1
1,1-Dichloropropene	ND		ug/kg	5.3	0.35	1
Bromoform	ND		ug/kg	4.3	0.25	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	0.32	1
Benzene	ND		ug/kg	1.1	0.20	1
Toluene	ND		ug/kg	1.6	0.21	1
Ethylbenzene	ND		ug/kg	1.1	0.18	1
Chloromethane	ND		ug/kg	5.3	0.46	1
Bromomethane	ND		ug/kg	2.1	0.36	1
Vinyl chloride	ND		ug/kg	2.1	0.34	1
Chloroethane	ND		ug/kg	2.1	0.34	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.40	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	0.26	1
Trichloroethene	ND		ug/kg	1.1	0.32	1
1,2-Dichlorobenzene	ND		ug/kg	5.3	0.19	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04 Date Collected: 12/14/17 09:50

Client ID: SB006 (7.5-9.5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.3	0.23	1
1,4-Dichlorobenzene	ND		ug/kg	5.3	0.19	1
Methyl tert butyl ether	ND		ug/kg	2.1	0.16	1
p/m-Xylene	ND		ug/kg	2.1	0.37	1
o-Xylene	ND		ug/kg	2.1	0.36	1
Xylenes, Total	ND		ug/kg	2.1	0.36	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.36	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	0.26	1
Dibromomethane	ND		ug/kg	11	0.26	1
Styrene	ND		ug/kg	2.1	0.43	1
Dichlorodifluoromethane	ND		ug/kg	11	0.53	1
Acetone	4.5	J	ug/kg	11	2.4	1
Carbon disulfide	ND		ug/kg	11	1.2	1
2-Butanone	ND		ug/kg	11	0.74	1
Vinyl acetate	ND		ug/kg	11	0.16	1
4-Methyl-2-pentanone	ND		ug/kg	11	0.26	1
1,2,3-Trichloropropane	ND		ug/kg	11	0.19	1
2-Hexanone	ND		ug/kg	11	0.71	1
Bromochloromethane	ND		ug/kg	5.3	0.38	1
2,2-Dichloropropane	ND		ug/kg	5.3	0.48	1
1,2-Dibromoethane	ND		ug/kg	4.3	0.21	1
1,3-Dichloropropane	ND		ug/kg	5.3	0.20	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	0.34	1
Bromobenzene	ND		ug/kg	5.3	0.23	1
n-Butylbenzene	ND		ug/kg	1.1	0.24	1
sec-Butylbenzene	ND		ug/kg	1.1	0.23	1
tert-Butylbenzene	ND		ug/kg	5.3	0.26	1
o-Chlorotoluene	ND		ug/kg	5.3	0.24	1
p-Chlorotoluene	ND		ug/kg	5.3	0.20	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.3	0.42	1
Hexachlorobutadiene	ND		ug/kg	5.3	0.37	1
Isopropylbenzene	ND		ug/kg	1.1	0.21	1
p-Isopropyltoluene	ND		ug/kg	1.1	0.22	1
Naphthalene	ND		ug/kg	5.3	0.15	1
Acrylonitrile	ND		ug/kg	11	0.55	1
n-Propylbenzene	ND		ug/kg	1.1	0.23	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.3	0.27	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.3	0.23	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.3	0.17	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04 Date Collected: 12/14/17 09:50

Client ID: SB006 (7.5-9.5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	5.3	0.20	1
1,4-Dioxane	ND		ug/kg	43	15.	1
p-Diethylbenzene	ND		ug/kg	4.3	4.3	1
p-Ethyltoluene	ND		ug/kg	4.3	0.25	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.3	0.17	1
Ethyl ether	ND		ug/kg	5.3	0.28	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.3	0.42	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	92		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	103		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05
Client ID: SB007 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 10:00
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/21/17 23:30
Analyst: MV
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	13	2.2	1
1,1-Dichloroethane	ND		ug/kg	2.0	0.36	1
Chloroform	ND		ug/kg	2.0	0.49	1
Carbon tetrachloride	ND		ug/kg	1.3	0.45	1
1,2-Dichloropropane	ND		ug/kg	4.6	0.30	1
Dibromochloromethane	ND		ug/kg	1.3	0.23	1
1,1,2-Trichloroethane	ND		ug/kg	2.0	0.41	1
Tetrachloroethene	ND		ug/kg	1.3	0.40	1
Chlorobenzene	ND		ug/kg	1.3	0.46	1
Trichlorofluoromethane	ND		ug/kg	6.6	0.55	1
1,2-Dichloroethane	ND		ug/kg	1.3	0.32	1
1,1,1-Trichloroethane	ND		ug/kg	1.3	0.46	1
Bromodichloromethane	ND		ug/kg	1.3	0.40	1
trans-1,3-Dichloropropene	ND		ug/kg	1.3	0.27	1
cis-1,3-Dichloropropene	ND		ug/kg	1.3	0.30	1
1,3-Dichloropropene, Total	ND		ug/kg	1.3	0.27	1
1,1-Dichloropropene	ND		ug/kg	6.6	0.43	1
Bromoform	ND		ug/kg	5.3	0.31	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.3	0.39	1
Benzene	ND		ug/kg	1.3	0.25	1
Toluene	ND		ug/kg	2.0	0.26	1
Ethylbenzene	ND		ug/kg	1.3	0.22	1
Chloromethane	ND		ug/kg	6.6	0.57	1
Bromomethane	ND		ug/kg	2.6	0.44	1
Vinyl chloride	ND		ug/kg	2.6	0.41	1
Chloroethane	ND		ug/kg	2.6	0.42	1
1,1-Dichloroethene	ND		ug/kg	1.3	0.49	1
trans-1,2-Dichloroethene	ND		ug/kg	2.0	0.32	1
Trichloroethene	ND		ug/kg	1.3	0.40	1
1,2-Dichlorobenzene	ND		ug/kg	6.6	0.24	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05 Date Collected: 12/14/17 10:00

Client ID: SB007 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.6	0.29	1
1,4-Dichlorobenzene	ND		ug/kg	6.6	0.24	1
Methyl tert butyl ether	ND		ug/kg	2.6	0.20	1
p/m-Xylene	ND		ug/kg	2.6	0.46	1
o-Xylene	ND		ug/kg	2.6	0.44	1
Xylenes, Total	ND		ug/kg	2.6	0.44	1
cis-1,2-Dichloroethene	ND		ug/kg	1.3	0.45	1
1,2-Dichloroethene, Total	ND		ug/kg	1.3	0.32	1
Dibromomethane	ND		ug/kg	13	0.31	1
Styrene	ND		ug/kg	2.6	0.53	1
Dichlorodifluoromethane	ND		ug/kg	13	0.66	1
Acetone	ND		ug/kg	13	3.0	1
Carbon disulfide	ND		ug/kg	13	1.4	1
2-Butanone	ND		ug/kg	13	0.91	1
Vinyl acetate	ND		ug/kg	13	0.20	1
4-Methyl-2-pentanone	ND		ug/kg	13	0.32	1
1,2,3-Trichloropropane	ND		ug/kg	13	0.23	1
2-Hexanone	ND		ug/kg	13	0.88	1
Bromochloromethane	ND		ug/kg	6.6	0.47	1
2,2-Dichloropropane	ND		ug/kg	6.6	0.59	1
1,2-Dibromoethane	ND		ug/kg	5.3	0.26	1
1,3-Dichloropropane	ND		ug/kg	6.6	0.24	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.3	0.42	1
Bromobenzene	ND		ug/kg	6.6	0.29	1
n-Butylbenzene	ND		ug/kg	1.3	0.30	1
sec-Butylbenzene	ND		ug/kg	1.3	0.28	1
tert-Butylbenzene	ND		ug/kg	6.6	0.32	1
o-Chlorotoluene	ND		ug/kg	6.6	0.29	1
p-Chlorotoluene	ND		ug/kg	6.6	0.24	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.6	0.52	1
Hexachlorobutadiene	ND		ug/kg	6.6	0.46	1
Isopropylbenzene	ND		ug/kg	1.3	0.26	1
p-Isopropyltoluene	ND		ug/kg	1.3	0.26	1
Naphthalene	ND		ug/kg	6.6	0.18	1
Acrylonitrile	ND		ug/kg	13	0.68	1
n-Propylbenzene	ND		ug/kg	1.3	0.28	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.6	0.33	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.6	0.28	1
1,3,5-Trimethylbenzene	ND		ug/kg	6.6	0.21	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05 Date Collected: 12/14/17 10:00

Client ID: SB007 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	6.6	0.24	1
1,4-Dioxane	ND		ug/kg	53	19.	1
p-Diethylbenzene	ND		ug/kg	5.3	5.3	1
p-Ethyltoluene	ND		ug/kg	5.3	0.31	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	5.3	0.20	1
Ethyl ether	ND		ug/kg	6.6	0.34	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.6	0.52	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	96		70-130
4-Bromofluorobenzene	111		70-130
Dibromofluoromethane	106		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06
Client ID: SB007 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 10:05
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/21/17 23:56
Analyst: MV
Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	9.2	1.5	1
1,1-Dichloroethane	ND		ug/kg	1.4	0.25	1
Chloroform	ND		ug/kg	1.4	0.34	1
Carbon tetrachloride	ND		ug/kg	0.92	0.32	1
1,2-Dichloropropane	ND		ug/kg	3.2	0.21	1
Dibromochloromethane	ND		ug/kg	0.92	0.16	1
1,1,2-Trichloroethane	ND		ug/kg	1.4	0.29	1
Tetrachloroethene	ND		ug/kg	0.92	0.28	1
Chlorobenzene	ND		ug/kg	0.92	0.32	1
Trichlorofluoromethane	ND		ug/kg	4.6	0.38	1
1,2-Dichloroethane	ND		ug/kg	0.92	0.23	1
1,1,1-Trichloroethane	ND		ug/kg	0.92	0.32	1
Bromodichloromethane	ND		ug/kg	0.92	0.28	1
trans-1,3-Dichloropropene	ND		ug/kg	0.92	0.19	1
cis-1,3-Dichloropropene	ND		ug/kg	0.92	0.21	1
1,3-Dichloropropene, Total	ND		ug/kg	0.92	0.19	1
1,1-Dichloropropene	ND		ug/kg	4.6	0.30	1
Bromoform	ND		ug/kg	3.7	0.22	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.92	0.28	1
Benzene	ND		ug/kg	0.92	0.18	1
Toluene	ND		ug/kg	1.4	0.18	1
Ethylbenzene	ND		ug/kg	0.92	0.16	1
Chloromethane	ND		ug/kg	4.6	0.40	1
Bromomethane	ND		ug/kg	1.8	0.31	1
Vinyl chloride	ND		ug/kg	1.8	0.29	1
Chloroethane	ND		ug/kg	1.8	0.29	1
1,1-Dichloroethene	ND		ug/kg	0.92	0.34	1
trans-1,2-Dichloroethene	ND		ug/kg	1.4	0.22	1
Trichloroethene	ND		ug/kg	0.92	0.28	1
1,2-Dichlorobenzene	ND		ug/kg	4.6	0.17	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06 Date Collected: 12/14/17 10:05

Client ID: SB007 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.6	0.20	1
1,4-Dichlorobenzene	ND		ug/kg	4.6	0.17	1
Methyl tert butyl ether	ND		ug/kg	1.8	0.14	1
p/m-Xylene	ND		ug/kg	1.8	0.32	1
o-Xylene	ND		ug/kg	1.8	0.31	1
Xylenes, Total	ND		ug/kg	1.8	0.31	1
cis-1,2-Dichloroethene	ND		ug/kg	0.92	0.32	1
1,2-Dichloroethene, Total	ND		ug/kg	0.92	0.22	1
Dibromomethane	ND		ug/kg	9.2	0.22	1
Styrene	ND		ug/kg	1.8	0.37	1
Dichlorodifluoromethane	ND		ug/kg	9.2	0.46	1
Acetone	ND		ug/kg	9.2	2.1	1
Carbon disulfide	ND		ug/kg	9.2	1.0	1
2-Butanone	ND		ug/kg	9.2	0.64	1
Vinyl acetate	ND		ug/kg	9.2	0.14	1
4-Methyl-2-pentanone	ND		ug/kg	9.2	0.22	1
1,2,3-Trichloropropane	ND		ug/kg	9.2	0.16	1
2-Hexanone	ND		ug/kg	9.2	0.62	1
Bromochloromethane	ND		ug/kg	4.6	0.33	1
2,2-Dichloropropane	ND		ug/kg	4.6	0.42	1
1,2-Dibromoethane	ND		ug/kg	3.7	0.18	1
1,3-Dichloropropane	ND		ug/kg	4.6	0.17	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.92	0.29	1
Bromobenzene	ND		ug/kg	4.6	0.20	1
n-Butylbenzene	ND		ug/kg	0.92	0.21	1
sec-Butylbenzene	ND		ug/kg	0.92	0.20	1
tert-Butylbenzene	ND		ug/kg	4.6	0.23	1
o-Chlorotoluene	ND		ug/kg	4.6	0.20	1
p-Chlorotoluene	ND		ug/kg	4.6	0.17	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.6	0.37	1
Hexachlorobutadiene	ND		ug/kg	4.6	0.32	1
Isopropylbenzene	ND		ug/kg	0.92	0.18	1
p-Isopropyltoluene	ND		ug/kg	0.92	0.19	1
Naphthalene	ND		ug/kg	4.6	0.13	1
Acrylonitrile	ND		ug/kg	9.2	0.48	1
n-Propylbenzene	ND		ug/kg	0.92	0.20	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.6	0.23	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.6	0.20	1
1,3,5-Trimethylbenzene	ND		ug/kg	4.6	0.15	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06 Date Collected: 12/14/17 10:05

Client ID: SB007 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	4.6	0.17	1
1,4-Dioxane	ND		ug/kg	37	13.	1
p-Diethylbenzene	ND		ug/kg	3.7	3.7	1
p-Ethyltoluene	ND		ug/kg	3.7	0.22	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	3.7	0.14	1
Ethyl ether	ND		ug/kg	4.6	0.24	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	4.6	0.36	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	92		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	103		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07
Client ID: SB008 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 10:25
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 00:22
Analyst: MV
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	13	2.2	1
1,1-Dichloroethane	ND		ug/kg	2.0	0.35	1
Chloroform	ND		ug/kg	2.0	0.48	1
Carbon tetrachloride	ND		ug/kg	1.3	0.45	1
1,2-Dichloropropane	ND		ug/kg	4.6	0.30	1
Dibromochloromethane	ND		ug/kg	1.3	0.23	1
1,1,2-Trichloroethane	ND		ug/kg	2.0	0.41	1
Tetrachloroethene	ND		ug/kg	1.3	0.40	1
Chlorobenzene	ND		ug/kg	1.3	0.46	1
Trichlorofluoromethane	ND		ug/kg	6.6	0.55	1
1,2-Dichloroethane	ND		ug/kg	1.3	0.32	1
1,1,1-Trichloroethane	ND		ug/kg	1.3	0.46	1
Bromodichloromethane	ND		ug/kg	1.3	0.40	1
trans-1,3-Dichloropropene	ND		ug/kg	1.3	0.27	1
cis-1,3-Dichloropropene	ND		ug/kg	1.3	0.30	1
1,3-Dichloropropene, Total	ND		ug/kg	1.3	0.27	1
1,1-Dichloropropene	ND		ug/kg	6.6	0.43	1
Bromoform	ND		ug/kg	5.2	0.31	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.3	0.39	1
Benzene	ND		ug/kg	1.3	0.25	1
Toluene	ND		ug/kg	2.0	0.26	1
Ethylbenzene	ND		ug/kg	1.3	0.22	1
Chloromethane	ND		ug/kg	6.6	0.57	1
Bromomethane	ND		ug/kg	2.6	0.44	1
Vinyl chloride	ND		ug/kg	2.6	0.41	1
Chloroethane	ND		ug/kg	2.6	0.41	1
1,1-Dichloroethene	ND		ug/kg	1.3	0.49	1
trans-1,2-Dichloroethene	ND		ug/kg	2.0	0.32	1
Trichloroethene	ND		ug/kg	1.3	0.40	1
1,2-Dichlorobenzene	ND		ug/kg	6.6	0.24	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07 Date Collected: 12/14/17 10:25

Client ID: SB008 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.6	0.28	1
1,4-Dichlorobenzene	ND		ug/kg	6.6	0.24	1
Methyl tert butyl ether	ND		ug/kg	2.6	0.20	1
p/m-Xylene	ND		ug/kg	2.6	0.46	1
o-Xylene	ND		ug/kg	2.6	0.44	1
Xylenes, Total	ND		ug/kg	2.6	0.44	1
cis-1,2-Dichloroethene	ND		ug/kg	1.3	0.45	1
1,2-Dichloroethene, Total	ND		ug/kg	1.3	0.32	1
Dibromomethane	ND		ug/kg	13	0.31	1
Styrene	ND		ug/kg	2.6	0.52	1
Dichlorodifluoromethane	ND		ug/kg	13	0.66	1
Acetone	10	J	ug/kg	13	3.0	1
Carbon disulfide	ND		ug/kg	13	1.4	1
2-Butanone	ND		ug/kg	13	0.90	1
Vinyl acetate	ND		ug/kg	13	0.20	1
4-Methyl-2-pentanone	ND		ug/kg	13	0.32	1
1,2,3-Trichloropropane	ND		ug/kg	13	0.23	1
2-Hexanone	ND		ug/kg	13	0.87	1
Bromochloromethane	ND		ug/kg	6.6	0.47	1
2,2-Dichloropropane	ND		ug/kg	6.6	0.59	1
1,2-Dibromoethane	ND		ug/kg	5.2	0.26	1
1,3-Dichloropropane	ND		ug/kg	6.6	0.24	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.3	0.42	1
Bromobenzene	ND		ug/kg	6.6	0.29	1
n-Butylbenzene	ND		ug/kg	1.3	0.30	1
sec-Butylbenzene	ND		ug/kg	1.3	0.28	1
tert-Butylbenzene	ND		ug/kg	6.6	0.32	1
o-Chlorotoluene	ND		ug/kg	6.6	0.29	1
p-Chlorotoluene	ND		ug/kg	6.6	0.24	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.6	0.52	1
Hexachlorobutadiene	ND		ug/kg	6.6	0.46	1
Isopropylbenzene	ND		ug/kg	1.3	0.25	1
p-Isopropyltoluene	ND		ug/kg	1.3	0.26	1
Naphthalene	ND		ug/kg	6.6	0.18	1
Acrylonitrile	ND		ug/kg	13	0.67	1
n-Propylbenzene	ND		ug/kg	1.3	0.28	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.6	0.33	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.6	0.28	1
1,3,5-Trimethylbenzene	ND		ug/kg	6.6	0.21	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07 Date Collected: 12/14/17 10:25

Client ID: SB008 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	6.6	0.24	1
1,4-Dioxane	ND		ug/kg	52	19.	1
p-Diethylbenzene	ND		ug/kg	5.2	5.2	1
p-Ethyltoluene	ND		ug/kg	5.2	0.31	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	5.2	0.20	1
Ethyl ether	ND		ug/kg	6.6	0.34	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.6	0.51	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	**147**	Q	70-130
Toluene-d8	88		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	117		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07
Client ID: SB008 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 10:25
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/26/17 09:03
Analyst: CBN
Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	640	100	1
1,1-Dichloroethane	ND		ug/kg	95	17.	1
Chloroform	ND		ug/kg	95	24.	1
Carbon tetrachloride	ND		ug/kg	64	22.	1
1,2-Dichloropropane	ND		ug/kg	220	14.	1
Dibromochloromethane	ND		ug/kg	64	11.	1
1,1,2-Trichloroethane	ND		ug/kg	95	20.	1
Tetrachloroethene	ND		ug/kg	64	19.	1
Chlorobenzene	ND		ug/kg	64	22.	1
Trichlorofluoromethane	ND		ug/kg	320	26.	1
1,2-Dichloroethane	ND		ug/kg	64	16.	1
1,1,1-Trichloroethane	ND		ug/kg	64	22.	1
Bromodichloromethane	ND		ug/kg	64	20.	1
trans-1,3-Dichloropropene	ND		ug/kg	64	13.	1
cis-1,3-Dichloropropene	ND		ug/kg	64	15.	1
1,3-Dichloropropene, Total	ND		ug/kg	64	13.	1
1,1-Dichloropropene	ND		ug/kg	320	21.	1
Bromoform	ND		ug/kg	250	15.	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	64	19.	1
Benzene	ND		ug/kg	64	12.	1
Toluene	41	J	ug/kg	95	12.	1
Ethylbenzene	17	J	ug/kg	64	11.	1
Chloromethane	ND		ug/kg	320	28.	1
Bromomethane	ND		ug/kg	130	22.	1
Vinyl chloride	ND		ug/kg	130	20.	1
Chloroethane	ND		ug/kg	130	20.	1
1,1-Dichloroethene	ND		ug/kg	64	24.	1
trans-1,2-Dichloroethene	ND		ug/kg	95	15.	1
Trichloroethene	ND		ug/kg	64	19.	1
1,2-Dichlorobenzene	ND		ug/kg	320	12.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07 Date Collected: 12/14/17 10:25

Client ID: SB008 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 High - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	320	14.	1
1,4-Dichlorobenzene	ND		ug/kg	320	12.	1
Methyl tert butyl ether	16	J	ug/kg	130	9.7	1
p/m-Xylene	120	J	ug/kg	130	22.	1
o-Xylene	46	J	ug/kg	130	22.	1
Xylene (Total)	170	J	ug/kg	130	22.	1
cis-1,2-Dichloroethene	ND		ug/kg	64	22.	1
1,2-Dichloroethene (total)	ND		ug/kg	64	15.	1
Dibromomethane	ND		ug/kg	640	15.	1
Styrene	ND		ug/kg	130	26.	1
Dichlorodifluoromethane	ND		ug/kg	640	32.	1
Acetone	ND		ug/kg	640	140	1
Carbon disulfide	ND		ug/kg	640	70.	1
2-Butanone	ND		ug/kg	640	44.	1
Vinyl acetate	ND		ug/kg	640	9.7	1
4-Methyl-2-pentanone	ND		ug/kg	640	16.	1
1,2,3-Trichloropropane	ND		ug/kg	640	11.	1
2-Hexanone	ND		ug/kg	640	42.	1
Bromochloromethane	ND		ug/kg	320	23.	1
2,2-Dichloropropane	ND		ug/kg	320	29.	1
1,2-Dibromoethane	ND		ug/kg	250	13.	1
1,3-Dichloropropane	ND		ug/kg	320	12.	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	64	20.	1
Bromobenzene	ND		ug/kg	320	14.	1
n-Butylbenzene	ND		ug/kg	64	14.	1
sec-Butylbenzene	ND		ug/kg	64	14.	1
tert-Butylbenzene	ND		ug/kg	320	16.	1
o-Chlorotoluene	ND		ug/kg	320	14.	1
p-Chlorotoluene	ND		ug/kg	320	12.	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	320	25.	1
Hexachlorobutadiene	ND		ug/kg	320	22.	1
Isopropylbenzene	ND		ug/kg	64	12.	1
p-Isopropyltoluene	ND		ug/kg	64	13.	1
Naphthalene	41	J	ug/kg	320	8.8	1
Acrylonitrile	ND		ug/kg	640	33.	1
n-Propylbenzene	18	J	ug/kg	64	14.	1
1,2,3-Trichlorobenzene	ND		ug/kg	320	16.	1
1,2,4-Trichlorobenzene	ND		ug/kg	320	14.	1
1,3,5-Trimethylbenzene	26	J	ug/kg	320	10.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07 Date Collected: 12/14/17 10:25

Client ID: SB008 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by EPA 5035 High - Westborough Lab						
1,2,4-Trimethylbenzene	58	J	ug/kg	320	12.	1
1,4-Dioxane	ND		ug/kg	2500	920	1
1,4-Diethylbenzene	ND		ug/kg	250	250	1
4-Ethyltoluene	49	J	ug/kg	250	15.	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	250	9.9	1
Ethyl ether	ND		ug/kg	320	16.	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	320	25.	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	109		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	99		70-130
Dibromofluoromethane	100		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08
Client ID: SB008 (10-12)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 10:30
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 00:48
Analyst: MV
Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	12	1.9	1
1,1-Dichloroethane	ND		ug/kg	1.8	0.32	1
Chloroform	ND		ug/kg	1.8	0.43	1
Carbon tetrachloride	ND		ug/kg	1.2	0.40	1
1,2-Dichloropropane	ND		ug/kg	4.1	0.27	1
Dibromochloromethane	ND		ug/kg	1.2	0.21	1
1,1,2-Trichloroethane	ND		ug/kg	1.8	0.37	1
Tetrachloroethene	ND		ug/kg	1.2	0.35	1
Chlorobenzene	ND		ug/kg	1.2	0.41	1
Trichlorofluoromethane	ND		ug/kg	5.9	0.49	1
1,2-Dichloroethane	ND		ug/kg	1.2	0.29	1
1,1,1-Trichloroethane	ND		ug/kg	1.2	0.41	1
Bromodichloromethane	ND		ug/kg	1.2	0.36	1
trans-1,3-Dichloropropene	ND		ug/kg	1.2	0.24	1
cis-1,3-Dichloropropene	ND		ug/kg	1.2	0.27	1
1,3-Dichloropropene, Total	ND		ug/kg	1.2	0.24	1
1,1-Dichloropropene	ND		ug/kg	5.9	0.38	1
Bromoform	ND		ug/kg	4.7	0.28	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.2	0.35	1
Benzene	ND		ug/kg	1.2	0.23	1
Toluene	ND		ug/kg	1.8	0.23	1
Ethylbenzene	ND		ug/kg	1.2	0.20	1
Chloromethane	ND		ug/kg	5.9	0.51	1
Bromomethane	ND		ug/kg	2.3	0.40	1
Vinyl chloride	ND		ug/kg	2.3	0.37	1
Chloroethane	ND		ug/kg	2.3	0.37	1
1,1-Dichloroethene	ND		ug/kg	1.2	0.44	1
trans-1,2-Dichloroethene	ND		ug/kg	1.8	0.28	1
Trichloroethene	ND		ug/kg	1.2	0.35	1
1,2-Dichlorobenzene	ND		ug/kg	5.9	0.21	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08 Date Collected: 12/14/17 10:30

Client ID: SB008 (10-12) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.9	0.26	1
1,4-Dichlorobenzene	ND		ug/kg	5.9	0.21	1
Methyl tert butyl ether	ND		ug/kg	2.3	0.18	1
p/m-Xylene	ND		ug/kg	2.3	0.41	1
o-Xylene	ND		ug/kg	2.3	0.40	1
Xylenes, Total	ND		ug/kg	2.3	0.40	1
cis-1,2-Dichloroethene	ND		ug/kg	1.2	0.40	1
1,2-Dichloroethene, Total	ND		ug/kg	1.2	0.28	1
Dibromomethane	ND		ug/kg	12	0.28	1
Styrene	ND		ug/kg	2.3	0.47	1
Dichlorodifluoromethane	ND		ug/kg	12	0.59	1
Acetone	ND		ug/kg	12	2.7	1
Carbon disulfide	ND		ug/kg	12	1.3	1
2-Butanone	ND		ug/kg	12	0.81	1
Vinyl acetate	ND		ug/kg	12	0.18	1
4-Methyl-2-pentanone	ND		ug/kg	12	0.29	1
1,2,3-Trichloropropane	ND		ug/kg	12	0.21	1
2-Hexanone	ND		ug/kg	12	0.78	1
Bromochloromethane	ND		ug/kg	5.9	0.42	1
2,2-Dichloropropane	ND		ug/kg	5.9	0.53	1
1,2-Dibromoethane	ND		ug/kg	4.7	0.23	1
1,3-Dichloropropane	ND		ug/kg	5.9	0.21	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.2	0.37	1
Bromobenzene	ND		ug/kg	5.9	0.26	1
n-Butylbenzene	ND		ug/kg	1.2	0.27	1
sec-Butylbenzene	ND		ug/kg	1.2	0.25	1
tert-Butylbenzene	ND		ug/kg	5.9	0.29	1
o-Chlorotoluene	ND		ug/kg	5.9	0.26	1
p-Chlorotoluene	ND		ug/kg	5.9	0.21	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.9	0.46	1
Hexachlorobutadiene	ND		ug/kg	5.9	0.41	1
Isopropylbenzene	ND		ug/kg	1.2	0.23	1
p-Isopropyltoluene	ND		ug/kg	1.2	0.24	1
Naphthalene	ND		ug/kg	5.9	0.16	1
Acrylonitrile	ND		ug/kg	12	0.60	1
n-Propylbenzene	ND		ug/kg	1.2	0.25	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.9	0.29	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.9	0.25	1
1,3,5-Trimethylbenzene	ND		ug/kg	5.9	0.19	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08 Date Collected: 12/14/17 10:30

Client ID: SB008 (10-12) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/kg	5.9	0.22	1
1,4-Dioxane	ND		ug/kg	47	17.	1
p-Diethylbenzene	ND		ug/kg	4.7	4.7	1
p-Ethyltoluene	ND		ug/kg	4.7	0.27	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.7	0.18	1
Ethyl ether	ND		ug/kg	5.9	0.30	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.9	0.46	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	91		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	104		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09
Client ID: SB009 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 10:50
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 19:31
Analyst: CBN
Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	1.8	1
1,1-Dichloroethane	ND		ug/kg	1.6	0.30	1
Chloroform	ND		ug/kg	1.6	0.40	1
Carbon tetrachloride	ND		ug/kg	1.1	0.38	1
1,2-Dichloropropane	ND		ug/kg	3.8	0.25	1
Dibromochloromethane	ND		ug/kg	1.1	0.19	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	0.34	1
Tetrachloroethene	ND		ug/kg	1.1	0.33	1
Chlorobenzene	ND		ug/kg	1.1	0.38	1
Trichlorofluoromethane	ND		ug/kg	5.5	0.46	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.27	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	0.38	1
Bromodichloromethane	ND		ug/kg	1.1	0.34	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.23	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	0.25	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	0.23	1
1,1-Dichloropropene	ND		ug/kg	5.5	0.36	1
Bromoform	ND		ug/kg	4.4	0.26	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	0.32	1
Benzene	ND		ug/kg	1.1	0.21	1
Toluene	ND		ug/kg	1.6	0.21	1
Ethylbenzene	0.27	J	ug/kg	1.1	0.18	1
Chloromethane	ND		ug/kg	5.5	0.48	1
Bromomethane	ND		ug/kg	2.2	0.37	1
Vinyl chloride	ND		ug/kg	2.2	0.34	1
Chloroethane	ND		ug/kg	2.2	0.34	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.41	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	0.26	1
Trichloroethene	ND		ug/kg	1.1	0.33	1
1,2-Dichlorobenzene	ND		ug/kg	5.5	0.20	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09 Date Collected: 12/14/17 10:50

Client ID: SB009 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.5	0.24	1
1,4-Dichlorobenzene	ND		ug/kg	5.5	0.20	1
Methyl tert butyl ether	ND		ug/kg	2.2	0.17	1
p/m-Xylene	0.56	J	ug/kg	2.2	0.38	1
o-Xylene	ND		ug/kg	2.2	0.37	1
Xylenes, Total	0.56	J	ug/kg	2.2	0.37	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.37	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	0.26	1
Dibromomethane	ND		ug/kg	11	0.26	1
Styrene	ND		ug/kg	2.2	0.44	1
Dichlorodifluoromethane	ND		ug/kg	11	0.55	1
Acetone	7.2	J	ug/kg	11	2.5	1
Carbon disulfide	ND		ug/kg	11	1.2	1
2-Butanone	ND		ug/kg	11	0.75	1
Vinyl acetate	ND		ug/kg	11	0.17	1
4-Methyl-2-pentanone	ND		ug/kg	11	0.27	1
1,2,3-Trichloropropane	ND		ug/kg	11	0.19	1
2-Hexanone	ND		ug/kg	11	0.73	1
Bromochloromethane	ND		ug/kg	5.5	0.39	1
2,2-Dichloropropane	ND		ug/kg	5.5	0.49	1
1,2-Dibromoethane	ND		ug/kg	4.4	0.22	1
1,3-Dichloropropane	ND		ug/kg	5.5	0.20	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	0.35	1
Bromobenzene	ND		ug/kg	5.5	0.24	1
n-Butylbenzene	ND		ug/kg	1.1	0.25	1
sec-Butylbenzene	ND		ug/kg	1.1	0.24	1
tert-Butylbenzene	ND		ug/kg	5.5	0.27	1
o-Chlorotoluene	ND		ug/kg	5.5	0.24	1
p-Chlorotoluene	ND		ug/kg	5.5	0.20	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.5	0.43	1
Hexachlorobutadiene	ND		ug/kg	5.5	0.38	1
Isopropylbenzene	ND		ug/kg	1.1	0.21	1
p-Isopropyltoluene	ND		ug/kg	1.1	0.22	1
Naphthalene	ND		ug/kg	5.5	0.15	1
Acrylonitrile	ND		ug/kg	11	0.56	1
n-Propylbenzene	0.37	J	ug/kg	1.1	0.24	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.5	0.27	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.5	0.24	1
1,3,5-Trimethylbenzene	0.46	J	ug/kg	5.5	0.18	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09 Date Collected: 12/14/17 10:50

Client ID: SB009 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	1.1	J	ug/kg	5.5	0.20	1
1,4-Dioxane	ND		ug/kg	44	16.	1
p-Diethylbenzene	ND		ug/kg	4.4	4.4	1
p-Ethyltoluene	1.2	J	ug/kg	4.4	0.26	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.4	0.17	1
Ethyl ether	ND		ug/kg	5.5	0.28	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.5	0.43	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	121		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	104		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10
Client ID: SB009 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 10:55
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 19:57
Analyst: CBN
Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	1.8	1
1,1-Dichloroethane	ND		ug/kg	1.6	0.29	1
Chloroform	ND		ug/kg	1.6	0.40	1
Carbon tetrachloride	ND		ug/kg	1.1	0.38	1
1,2-Dichloropropane	ND		ug/kg	3.8	0.25	1
Dibromochloromethane	ND		ug/kg	1.1	0.19	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	0.34	1
Tetrachloroethene	ND		ug/kg	1.1	0.33	1
Chlorobenzene	ND		ug/kg	1.1	0.38	1
Trichlorofluoromethane	ND		ug/kg	5.4	0.45	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.27	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	0.38	1
Bromodichloromethane	ND		ug/kg	1.1	0.34	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.23	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	0.25	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	0.23	1
1,1-Dichloropropene	ND		ug/kg	5.4	0.36	1
Bromoform	ND		ug/kg	4.4	0.26	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	0.32	1
Benzene	ND		ug/kg	1.1	0.21	1
Toluene	ND		ug/kg	1.6	0.21	1
Ethylbenzene	ND		ug/kg	1.1	0.18	1
Chloromethane	ND		ug/kg	5.4	0.48	1
Bromomethane	ND		ug/kg	2.2	0.37	1
Vinyl chloride	ND		ug/kg	2.2	0.34	1
Chloroethane	ND		ug/kg	2.2	0.34	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.40	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	0.26	1
Trichloroethene	ND		ug/kg	1.1	0.33	1
1,2-Dichlorobenzene	ND		ug/kg	5.4	0.20	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10 Date Collected: 12/14/17 10:55

Client ID: SB009 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.4	0.24	1
1,4-Dichlorobenzene	ND		ug/kg	5.4	0.20	1
Methyl tert butyl ether	ND		ug/kg	2.2	0.17	1
p/m-Xylene	0.42	J	ug/kg	2.2	0.38	1
o-Xylene	ND		ug/kg	2.2	0.37	1
Xylenes, Total	0.42	J	ug/kg	2.2	0.37	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.37	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	0.26	1
Dibromomethane	ND		ug/kg	11	0.26	1
Styrene	ND		ug/kg	2.2	0.44	1
Dichlorodifluoromethane	ND		ug/kg	11	0.54	1
Acetone	ND		ug/kg	11	2.5	1
Carbon disulfide	ND		ug/kg	11	1.2	1
2-Butanone	ND		ug/kg	11	0.75	1
Vinyl acetate	ND		ug/kg	11	0.17	1
4-Methyl-2-pentanone	ND		ug/kg	11	0.27	1
1,2,3-Trichloropropane	ND		ug/kg	11	0.19	1
2-Hexanone	ND		ug/kg	11	0.73	1
Bromochloromethane	ND		ug/kg	5.4	0.39	1
2,2-Dichloropropane	ND		ug/kg	5.4	0.49	1
1,2-Dibromoethane	ND		ug/kg	4.4	0.22	1
1,3-Dichloropropane	ND		ug/kg	5.4	0.20	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	0.35	1
Bromobenzene	ND		ug/kg	5.4	0.24	1
n-Butylbenzene	ND		ug/kg	1.1	0.25	1
sec-Butylbenzene	ND		ug/kg	1.1	0.24	1
tert-Butylbenzene	ND		ug/kg	5.4	0.27	1
o-Chlorotoluene	ND		ug/kg	5.4	0.24	1
p-Chlorotoluene	ND		ug/kg	5.4	0.20	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.4	0.43	1
Hexachlorobutadiene	ND		ug/kg	5.4	0.38	1
Isopropylbenzene	ND		ug/kg	1.1	0.21	1
p-Isopropyltoluene	ND		ug/kg	1.1	0.22	1
Naphthalene	ND		ug/kg	5.4	0.15	1
Acrylonitrile	ND		ug/kg	11	0.56	1
n-Propylbenzene	0.27	J	ug/kg	1.1	0.23	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.4	0.27	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.4	0.23	1
1,3,5-Trimethylbenzene	0.35	J	ug/kg	5.4	0.18	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10 Date Collected: 12/14/17 10:55

Client ID: SB009 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.82	J	ug/kg	5.4	0.20	1
1,4-Dioxane	ND		ug/kg	44	16.	1
p-Diethylbenzene	ND		ug/kg	4.4	4.4	1
p-Ethyltoluene	0.88	J	ug/kg	4.4	0.26	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.4	0.17	1
Ethyl ether	ND		ug/kg	5.4	0.28	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.4	0.43	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	104		70-130
Dibromofluoromethane	100		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11
Client ID: SB010 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 11:05
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 20:23
Analyst: CBN
Percent Solids: 80%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	13	2.2	1
1,1-Dichloroethane	ND		ug/kg	2.0	0.36	1
Chloroform	ND		ug/kg	2.0	0.49	1
Carbon tetrachloride	ND		ug/kg	1.3	0.46	1
1,2-Dichloropropane	ND		ug/kg	4.7	0.30	1
Dibromochloromethane	ND		ug/kg	1.3	0.24	1
1,1,2-Trichloroethane	ND		ug/kg	2.0	0.42	1
Tetrachloroethene	ND		ug/kg	1.3	0.40	1
Chlorobenzene	ND		ug/kg	1.3	0.46	1
Trichlorofluoromethane	ND		ug/kg	6.7	0.56	1
1,2-Dichloroethane	ND		ug/kg	1.3	0.33	1
1,1,1-Trichloroethane	ND		ug/kg	1.3	0.47	1
Bromodichloromethane	ND		ug/kg	1.3	0.41	1
trans-1,3-Dichloropropene	ND		ug/kg	1.3	0.28	1
cis-1,3-Dichloropropene	ND		ug/kg	1.3	0.31	1
1,3-Dichloropropene, Total	ND		ug/kg	1.3	0.28	1
1,1-Dichloropropene	ND		ug/kg	6.7	0.44	1
Bromoform	ND		ug/kg	5.3	0.32	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.3	0.40	1
Benzene	0.33	J	ug/kg	1.3	0.26	1
Toluene	0.34	J	ug/kg	2.0	0.26	1
Ethylbenzene	0.31	J	ug/kg	1.3	0.23	1
Chloromethane	ND		ug/kg	6.7	0.58	1
Bromomethane	ND		ug/kg	2.7	0.45	1
Vinyl chloride	ND		ug/kg	2.7	0.42	1
Chloroethane	ND		ug/kg	2.7	0.42	1
1,1-Dichloroethene	ND		ug/kg	1.3	0.50	1
trans-1,2-Dichloroethene	ND		ug/kg	2.0	0.32	1
Trichloroethene	ND		ug/kg	1.3	0.40	1
1,2-Dichlorobenzene	ND		ug/kg	6.7	0.24	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11 Date Collected: 12/14/17 11:05

Client ID: SB010 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.7	0.29	1
1,4-Dichlorobenzene	ND		ug/kg	6.7	0.24	1
Methyl tert butyl ether	ND		ug/kg	2.7	0.20	1
p/m-Xylene	0.75	J	ug/kg	2.7	0.47	1
o-Xylene	ND		ug/kg	2.7	0.45	1
Xylenes, Total	0.75	J	ug/kg	2.7	0.45	1
cis-1,2-Dichloroethene	ND		ug/kg	1.3	0.46	1
1,2-Dichloroethene, Total	ND		ug/kg	1.3	0.32	1
Dibromomethane	ND		ug/kg	13	0.32	1
Styrene	ND		ug/kg	2.7	0.54	1
Dichlorodifluoromethane	ND		ug/kg	13	0.67	1
Acetone	13		ug/kg	13	3.1	1
Carbon disulfide	ND		ug/kg	13	1.5	1
2-Butanone	ND		ug/kg	13	0.92	1
Vinyl acetate	ND		ug/kg	13	0.20	1
4-Methyl-2-pentanone	ND		ug/kg	13	0.33	1
1,2,3-Trichloropropane	ND		ug/kg	13	0.24	1
2-Hexanone	ND		ug/kg	13	0.89	1
Bromochloromethane	ND		ug/kg	6.7	0.48	1
2,2-Dichloropropane	ND		ug/kg	6.7	0.60	1
1,2-Dibromoethane	ND		ug/kg	5.3	0.26	1
1,3-Dichloropropane	ND		ug/kg	6.7	0.24	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.3	0.42	1
Bromobenzene	ND		ug/kg	6.7	0.29	1
n-Butylbenzene	ND		ug/kg	1.3	0.30	1
sec-Butylbenzene	ND		ug/kg	1.3	0.29	1
tert-Butylbenzene	ND		ug/kg	6.7	0.33	1
o-Chlorotoluene	ND		ug/kg	6.7	0.30	1
p-Chlorotoluene	ND		ug/kg	6.7	0.24	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.7	0.53	1
Hexachlorobutadiene	ND		ug/kg	6.7	0.46	1
Isopropylbenzene	ND		ug/kg	1.3	0.26	1
p-Isopropyltoluene	ND		ug/kg	1.3	0.27	1
Naphthalene	ND		ug/kg	6.7	0.18	1
Acrylonitrile	ND		ug/kg	13	0.69	1
n-Propylbenzene	0.42	J	ug/kg	1.3	0.29	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.7	0.34	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.7	0.29	1
1,3,5-Trimethylbenzene	0.52	J	ug/kg	6.7	0.22	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11 Date Collected: 12/14/17 11:05

Client ID: SB010 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	1.3	J	ug/kg	6.7	0.25	1
1,4-Dioxane	ND		ug/kg	53	19.	1
p-Diethylbenzene	ND		ug/kg	5.3	5.3	1
p-Ethyltoluene	1.4	J	ug/kg	5.3	0.31	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	5.3	0.21	1
Ethyl ether	ND		ug/kg	6.7	0.35	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.7	0.52	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	107		70-130
4-Bromofluorobenzene	112		70-130
Dibromofluoromethane	100		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12
Client ID: SB010 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 11:10
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 20:49
Analyst: CBN
Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	9.1	1.5	1
1,1-Dichloroethane	ND		ug/kg	1.4	0.24	1
Chloroform	ND		ug/kg	1.4	0.34	1
Carbon tetrachloride	ND		ug/kg	0.91	0.31	1
1,2-Dichloropropane	ND		ug/kg	3.2	0.21	1
Dibromochloromethane	ND		ug/kg	0.91	0.16	1
1,1,2-Trichloroethane	ND		ug/kg	1.4	0.28	1
Tetrachloroethene	ND		ug/kg	0.91	0.27	1
Chlorobenzene	ND		ug/kg	0.91	0.32	1
Trichlorofluoromethane	ND		ug/kg	4.5	0.38	1
1,2-Dichloroethane	ND		ug/kg	0.91	0.22	1
1,1,1-Trichloroethane	ND		ug/kg	0.91	0.32	1
Bromodichloromethane	ND		ug/kg	0.91	0.28	1
trans-1,3-Dichloropropene	ND		ug/kg	0.91	0.19	1
cis-1,3-Dichloropropene	ND		ug/kg	0.91	0.21	1
1,3-Dichloropropene, Total	ND		ug/kg	0.91	0.19	1
1,1-Dichloropropene	ND		ug/kg	4.5	0.30	1
Bromoform	ND		ug/kg	3.6	0.21	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.91	0.27	1
Benzene	ND		ug/kg	0.91	0.18	1
Toluene	ND		ug/kg	1.4	0.18	1
Ethylbenzene	ND		ug/kg	0.91	0.15	1
Chloromethane	ND		ug/kg	4.5	0.40	1
Bromomethane	ND		ug/kg	1.8	0.31	1
Vinyl chloride	ND		ug/kg	1.8	0.28	1
Chloroethane	ND		ug/kg	1.8	0.29	1
1,1-Dichloroethene	ND		ug/kg	0.91	0.34	1
trans-1,2-Dichloroethene	ND		ug/kg	1.4	0.22	1
Trichloroethene	ND		ug/kg	0.91	0.27	1
1,2-Dichlorobenzene	ND		ug/kg	4.5	0.16	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12 Date Collected: 12/14/17 11:10

Client ID: SB010 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.5	0.20	1
1,4-Dichlorobenzene	ND		ug/kg	4.5	0.16	1
Methyl tert butyl ether	ND		ug/kg	1.8	0.14	1
p/m-Xylene	ND		ug/kg	1.8	0.32	1
o-Xylene	ND		ug/kg	1.8	0.31	1
Xylenes, Total	ND		ug/kg	1.8	0.31	1
cis-1,2-Dichloroethene	ND		ug/kg	0.91	0.31	1
1,2-Dichloroethene, Total	ND		ug/kg	0.91	0.22	1
Dibromomethane	ND		ug/kg	9.1	0.22	1
Styrene	ND		ug/kg	1.8	0.36	1
Dichlorodifluoromethane	ND		ug/kg	9.1	0.45	1
Acetone	ND		ug/kg	9.1	2.1	1
Carbon disulfide	ND		ug/kg	9.1	1.0	1
2-Butanone	ND		ug/kg	9.1	0.62	1
Vinyl acetate	ND		ug/kg	9.1	0.14	1
4-Methyl-2-pentanone	ND		ug/kg	9.1	0.22	1
1,2,3-Trichloropropane	ND		ug/kg	9.1	0.16	1
2-Hexanone	ND		ug/kg	9.1	0.60	1
Bromochloromethane	ND		ug/kg	4.5	0.32	1
2,2-Dichloropropane	ND		ug/kg	4.5	0.41	1
1,2-Dibromoethane	ND		ug/kg	3.6	0.18	1
1,3-Dichloropropane	ND		ug/kg	4.5	0.17	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.91	0.29	1
Bromobenzene	ND		ug/kg	4.5	0.20	1
n-Butylbenzene	ND		ug/kg	0.91	0.21	1
sec-Butylbenzene	ND		ug/kg	0.91	0.20	1
tert-Butylbenzene	ND		ug/kg	4.5	0.22	1
o-Chlorotoluene	ND		ug/kg	4.5	0.20	1
p-Chlorotoluene	ND		ug/kg	4.5	0.17	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.5	0.36	1
Hexachlorobutadiene	ND		ug/kg	4.5	0.32	1
Isopropylbenzene	ND		ug/kg	0.91	0.18	1
p-Isopropyltoluene	ND		ug/kg	0.91	0.18	1
Naphthalene	0.14	J	ug/kg	4.5	0.12	1
Acrylonitrile	ND		ug/kg	9.1	0.47	1
n-Propylbenzene	0.21	J	ug/kg	0.91	0.20	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.5	0.23	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.5	0.20	1
1,3,5-Trimethylbenzene	0.28	J	ug/kg	4.5	0.15	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12 Date Collected: 12/14/17 11:10

Client ID: SB010 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.70	J	ug/kg	4.5	0.17	1
1,4-Dioxane	ND		ug/kg	36	13.	1
p-Diethylbenzene	ND		ug/kg	3.6	3.6	1
p-Ethyltoluene	0.72	J	ug/kg	3.6	0.21	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	3.6	0.14	1
Ethyl ether	ND		ug/kg	4.5	0.24	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	4.5	0.36	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	100		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13
Client ID: SB011 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 11:20
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 21:15
Analyst: CBN
Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	14	2.3	1
1,1-Dichloroethane	ND		ug/kg	2.1	0.38	1
Chloroform	ND		ug/kg	2.1	0.52	1
Carbon tetrachloride	ND		ug/kg	1.4	0.48	1
1,2-Dichloropropane	ND		ug/kg	4.9	0.32	1
Dibromochloromethane	ND		ug/kg	1.4	0.25	1
1,1,2-Trichloroethane	ND		ug/kg	2.1	0.44	1
Tetrachloroethene	ND		ug/kg	1.4	0.42	1
Chlorobenzene	ND		ug/kg	1.4	0.49	1
Trichlorofluoromethane	ND		ug/kg	7.0	0.59	1
1,2-Dichloroethane	ND		ug/kg	1.4	0.34	1
1,1,1-Trichloroethane	ND		ug/kg	1.4	0.49	1
Bromodichloromethane	ND		ug/kg	1.4	0.43	1
trans-1,3-Dichloropropene	ND		ug/kg	1.4	0.29	1
cis-1,3-Dichloropropene	ND		ug/kg	1.4	0.32	1
1,3-Dichloropropene, Total	ND		ug/kg	1.4	0.29	1
1,1-Dichloropropene	ND		ug/kg	7.0	0.46	1
Bromoform	ND		ug/kg	5.6	0.33	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.4	0.42	1
Benzene	ND		ug/kg	1.4	0.27	1
Toluene	ND		ug/kg	2.1	0.27	1
Ethylbenzene	ND		ug/kg	1.4	0.24	1
Chloromethane	ND		ug/kg	7.0	0.61	1
Bromomethane	ND		ug/kg	2.8	0.48	1
Vinyl chloride	ND		ug/kg	2.8	0.44	1
Chloroethane	ND		ug/kg	2.8	0.44	1
1,1-Dichloroethene	ND		ug/kg	1.4	0.52	1
trans-1,2-Dichloroethene	ND		ug/kg	2.1	0.34	1
Trichloroethene	ND		ug/kg	1.4	0.42	1
1,2-Dichlorobenzene	ND		ug/kg	7.0	0.26	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13 Date Collected: 12/14/17 11:20

Client ID: SB011 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	7.0	0.31	1
1,4-Dichlorobenzene	ND		ug/kg	7.0	0.26	1
Methyl tert butyl ether	ND		ug/kg	2.8	0.22	1
p/m-Xylene	ND		ug/kg	2.8	0.49	1
o-Xylene	ND		ug/kg	2.8	0.48	1
Xylenes, Total	ND		ug/kg	2.8	0.48	1
cis-1,2-Dichloroethene	ND		ug/kg	1.4	0.48	1
1,2-Dichloroethene, Total	ND		ug/kg	1.4	0.34	1
Dibromomethane	ND		ug/kg	14	0.34	1
Styrene	ND		ug/kg	2.8	0.56	1
Dichlorodifluoromethane	ND		ug/kg	14	0.70	1
Acetone	6.9	J	ug/kg	14	3.2	1
Carbon disulfide	ND		ug/kg	14	1.5	1
2-Butanone	ND		ug/kg	14	0.97	1
Vinyl acetate	ND		ug/kg	14	0.22	1
4-Methyl-2-pentanone	ND		ug/kg	14	0.34	1
1,2,3-Trichloropropane	ND		ug/kg	14	0.25	1
2-Hexanone	ND		ug/kg	14	0.94	1
Bromochloromethane	ND		ug/kg	7.0	0.50	1
2,2-Dichloropropane	ND		ug/kg	7.0	0.63	1
1,2-Dibromoethane	ND		ug/kg	5.6	0.28	1
1,3-Dichloropropane	ND		ug/kg	7.0	0.26	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.4	0.45	1
Bromobenzene	ND		ug/kg	7.0	0.31	1
n-Butylbenzene	ND		ug/kg	1.4	0.32	1
sec-Butylbenzene	ND		ug/kg	1.4	0.30	1
tert-Butylbenzene	ND		ug/kg	7.0	0.35	1
o-Chlorotoluene	ND		ug/kg	7.0	0.31	1
p-Chlorotoluene	ND		ug/kg	7.0	0.26	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	7.0	0.56	1
Hexachlorobutadiene	ND		ug/kg	7.0	0.49	1
Isopropylbenzene	ND		ug/kg	1.4	0.27	1
p-Isopropyltoluene	ND		ug/kg	1.4	0.28	1
Naphthalene	0.28	J	ug/kg	7.0	0.19	1
Acrylonitrile	ND		ug/kg	14	0.72	1
n-Propylbenzene	ND		ug/kg	1.4	0.30	1
1,2,3-Trichlorobenzene	ND		ug/kg	7.0	0.35	1
1,2,4-Trichlorobenzene	ND		ug/kg	7.0	0.30	1
1,3,5-Trimethylbenzene	0.44	J	ug/kg	7.0	0.23	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13 Date Collected: 12/14/17 11:20

Client ID: SB011 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	1.1	J	ug/kg	7.0	0.26	1
1,4-Dioxane	ND		ug/kg	56	20.	1
p-Diethylbenzene	ND		ug/kg	5.6	5.6	1
p-Ethyltoluene	1.1	J	ug/kg	5.6	0.33	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	5.6	0.22	1
Ethyl ether	ND		ug/kg	7.0	0.36	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	7.0	0.55	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	107		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	106		70-130
Dibromofluoromethane	99		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14
Client ID: SB011 (5-7)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 11:25
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 21:41
Analyst: CBN
Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	11	1.8	1
1,1-Dichloroethane	ND		ug/kg	1.6	0.29	1
Chloroform	ND		ug/kg	1.6	0.40	1
Carbon tetrachloride	ND		ug/kg	1.1	0.37	1
1,2-Dichloropropane	ND		ug/kg	3.7	0.24	1
Dibromochloromethane	ND		ug/kg	1.1	0.19	1
1,1,2-Trichloroethane	ND		ug/kg	1.6	0.33	1
Tetrachloroethene	ND		ug/kg	1.1	0.32	1
Chlorobenzene	ND		ug/kg	1.1	0.37	1
Trichlorofluoromethane	ND		ug/kg	5.3	0.44	1
1,2-Dichloroethane	ND		ug/kg	1.1	0.26	1
1,1,1-Trichloroethane	ND		ug/kg	1.1	0.37	1
Bromodichloromethane	ND		ug/kg	1.1	0.33	1
trans-1,3-Dichloropropene	ND		ug/kg	1.1	0.22	1
cis-1,3-Dichloropropene	ND		ug/kg	1.1	0.25	1
1,3-Dichloropropene, Total	ND		ug/kg	1.1	0.22	1
1,1-Dichloropropene	ND		ug/kg	5.3	0.35	1
Bromoform	ND		ug/kg	4.3	0.25	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.1	0.32	1
Benzene	ND		ug/kg	1.1	0.21	1
Toluene	ND		ug/kg	1.6	0.21	1
Ethylbenzene	ND		ug/kg	1.1	0.18	1
Chloromethane	ND		ug/kg	5.3	0.46	1
Bromomethane	ND		ug/kg	2.1	0.36	1
Vinyl chloride	ND		ug/kg	2.1	0.34	1
Chloroethane	ND		ug/kg	2.1	0.34	1
1,1-Dichloroethene	ND		ug/kg	1.1	0.40	1
trans-1,2-Dichloroethene	ND		ug/kg	1.6	0.26	1
Trichloroethene	ND		ug/kg	1.1	0.32	1
1,2-Dichlorobenzene	ND		ug/kg	5.3	0.19	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14 Date Collected: 12/14/17 11:25

Client ID: SB011 (5-7) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	5.3	0.23	1
1,4-Dichlorobenzene	ND		ug/kg	5.3	0.19	1
Methyl tert butyl ether	ND		ug/kg	2.1	0.16	1
p/m-Xylene	ND		ug/kg	2.1	0.37	1
o-Xylene	ND		ug/kg	2.1	0.36	1
Xylenes, Total	ND		ug/kg	2.1	0.36	1
cis-1,2-Dichloroethene	ND		ug/kg	1.1	0.36	1
1,2-Dichloroethene, Total	ND		ug/kg	1.1	0.26	1
Dibromomethane	ND		ug/kg	11	0.26	1
Styrene	ND		ug/kg	2.1	0.43	1
Dichlorodifluoromethane	ND		ug/kg	11	0.53	1
Acetone	4.2	J	ug/kg	11	2.4	1
Carbon disulfide	ND		ug/kg	11	1.2	1
2-Butanone	ND		ug/kg	11	0.74	1
Vinyl acetate	ND		ug/kg	11	0.16	1
4-Methyl-2-pentanone	ND		ug/kg	11	0.26	1
1,2,3-Trichloropropane	ND		ug/kg	11	0.19	1
2-Hexanone	ND		ug/kg	11	0.71	1
Bromochloromethane	ND		ug/kg	5.3	0.38	1
2,2-Dichloropropane	ND		ug/kg	5.3	0.48	1
1,2-Dibromoethane	ND		ug/kg	4.3	0.21	1
1,3-Dichloropropane	ND		ug/kg	5.3	0.20	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.1	0.34	1
Bromobenzene	ND		ug/kg	5.3	0.23	1
n-Butylbenzene	ND		ug/kg	1.1	0.24	1
sec-Butylbenzene	ND		ug/kg	1.1	0.23	1
tert-Butylbenzene	ND		ug/kg	5.3	0.26	1
o-Chlorotoluene	ND		ug/kg	5.3	0.24	1
p-Chlorotoluene	ND		ug/kg	5.3	0.20	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.3	0.42	1
Hexachlorobutadiene	ND		ug/kg	5.3	0.37	1
Isopropylbenzene	ND		ug/kg	1.1	0.21	1
p-Isopropyltoluene	ND		ug/kg	1.1	0.22	1
Naphthalene	ND		ug/kg	5.3	0.15	1
Acrylonitrile	ND		ug/kg	11	0.55	1
n-Propylbenzene	ND		ug/kg	1.1	0.23	1
1,2,3-Trichlorobenzene	ND		ug/kg	5.3	0.27	1
1,2,4-Trichlorobenzene	ND		ug/kg	5.3	0.23	1
1,3,5-Trimethylbenzene	0.26	J	ug/kg	5.3	0.17	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14 Date Collected: 12/14/17 11:25

Client ID: SB011 (5-7) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.74	J	ug/kg	5.3	0.20	1
1,4-Dioxane	ND		ug/kg	43	15.	1
p-Diethylbenzene	ND		ug/kg	4.3	4.3	1
p-Ethyltoluene	0.78	J	ug/kg	4.3	0.25	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.3	0.17	1
Ethyl ether	ND		ug/kg	5.3	0.28	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.3	0.42	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	124		70-130
Toluene-d8	100		70-130
4-Bromofluorobenzene	104		70-130
Dibromofluoromethane	104		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15
Client ID: SB012 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 11:40
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 22:07
Analyst: CBN
Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	9.3	1.5	1
1,1-Dichloroethane	ND		ug/kg	1.4	0.25	1
Chloroform	ND		ug/kg	1.4	0.34	1
Carbon tetrachloride	ND		ug/kg	0.93	0.32	1
1,2-Dichloropropane	ND		ug/kg	3.3	0.21	1
Dibromochloromethane	ND		ug/kg	0.93	0.16	1
1,1,2-Trichloroethane	ND		ug/kg	1.4	0.29	1
Tetrachloroethene	ND		ug/kg	0.93	0.28	1
Chlorobenzene	ND		ug/kg	0.93	0.32	1
Trichlorofluoromethane	ND		ug/kg	4.6	0.39	1
1,2-Dichloroethane	ND		ug/kg	0.93	0.23	1
1,1,1-Trichloroethane	ND		ug/kg	0.93	0.33	1
Bromodichloromethane	ND		ug/kg	0.93	0.29	1
trans-1,3-Dichloropropene	ND		ug/kg	0.93	0.19	1
cis-1,3-Dichloropropene	ND		ug/kg	0.93	0.22	1
1,3-Dichloropropene, Total	ND		ug/kg	0.93	0.19	1
1,1-Dichloropropene	ND		ug/kg	4.6	0.30	1
Bromoform	ND		ug/kg	3.7	0.22	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.93	0.28	1
Benzene	ND		ug/kg	0.93	0.18	1
Toluene	ND		ug/kg	1.4	0.18	1
Ethylbenzene	ND		ug/kg	0.93	0.16	1
Chloromethane	ND		ug/kg	4.6	0.41	1
Bromomethane	ND		ug/kg	1.9	0.31	1
Vinyl chloride	ND		ug/kg	1.9	0.29	1
Chloroethane	ND		ug/kg	1.9	0.29	1
1,1-Dichloroethene	ND		ug/kg	0.93	0.35	1
trans-1,2-Dichloroethene	ND		ug/kg	1.4	0.22	1
Trichloroethene	ND		ug/kg	0.93	0.28	1
1,2-Dichlorobenzene	ND		ug/kg	4.6	0.17	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15 Date Collected: 12/14/17 11:40

Client ID: SB012 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.6	0.20	1
1,4-Dichlorobenzene	ND		ug/kg	4.6	0.17	1
Methyl tert butyl ether	ND		ug/kg	1.9	0.14	1
p/m-Xylene	ND		ug/kg	1.9	0.33	1
o-Xylene	ND		ug/kg	1.9	0.31	1
Xylenes, Total	ND		ug/kg	1.9	0.31	1
cis-1,2-Dichloroethene	ND		ug/kg	0.93	0.32	1
1,2-Dichloroethene, Total	ND		ug/kg	0.93	0.22	1
Dibromomethane	ND		ug/kg	9.3	0.22	1
Styrene	ND		ug/kg	1.9	0.37	1
Dichlorodifluoromethane	ND		ug/kg	9.3	0.46	1
Acetone	ND		ug/kg	9.3	2.1	1
Carbon disulfide	ND		ug/kg	9.3	1.0	1
2-Butanone	ND		ug/kg	9.3	0.64	1
Vinyl acetate	ND		ug/kg	9.3	0.14	1
4-Methyl-2-pentanone	ND		ug/kg	9.3	0.23	1
1,2,3-Trichloropropane	ND		ug/kg	9.3	0.16	1
2-Hexanone	ND		ug/kg	9.3	0.62	1
Bromochloromethane	ND		ug/kg	4.6	0.33	1
2,2-Dichloropropane	ND		ug/kg	4.6	0.42	1
1,2-Dibromoethane	ND		ug/kg	3.7	0.18	1
1,3-Dichloropropane	ND		ug/kg	4.6	0.17	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.93	0.30	1
Bromobenzene	ND		ug/kg	4.6	0.20	1
n-Butylbenzene	ND		ug/kg	0.93	0.21	1
sec-Butylbenzene	ND		ug/kg	0.93	0.20	1
tert-Butylbenzene	ND		ug/kg	4.6	0.23	1
o-Chlorotoluene	ND		ug/kg	4.6	0.20	1
p-Chlorotoluene	ND		ug/kg	4.6	0.17	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.6	0.37	1
Hexachlorobutadiene	ND		ug/kg	4.6	0.32	1
Isopropylbenzene	ND		ug/kg	0.93	0.18	1
p-Isopropyltoluene	ND		ug/kg	0.93	0.19	1
Naphthalene	ND		ug/kg	4.6	0.13	1
Acrylonitrile	ND		ug/kg	9.3	0.48	1
n-Propylbenzene	ND		ug/kg	0.93	0.20	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.6	0.23	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.6	0.20	1
1,3,5-Trimethylbenzene	0.23	J	ug/kg	4.6	0.15	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15 Date Collected: 12/14/17 11:40

Client ID: SB012 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.59	J	ug/kg	4.6	0.17	1
1,4-Dioxane	ND		ug/kg	37	13.	1
p-Diethylbenzene	ND		ug/kg	3.7	3.7	1
p-Ethyltoluene	0.62	J	ug/kg	3.7	0.22	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	3.7	0.14	1
Ethyl ether	ND		ug/kg	4.6	0.24	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	4.6	0.36	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	108		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	107		70-130
Dibromofluoromethane	100		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16
Client ID: SB012 (6-8)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 11:45
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/22/17 22:33
Analyst: CBN
Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	9.4	1.5	1
1,1-Dichloroethane	ND		ug/kg	1.4	0.25	1
Chloroform	ND		ug/kg	1.4	0.35	1
Carbon tetrachloride	ND		ug/kg	0.94	0.32	1
1,2-Dichloropropane	ND		ug/kg	3.3	0.21	1
Dibromochloromethane	ND		ug/kg	0.94	0.16	1
1,1,2-Trichloroethane	ND		ug/kg	1.4	0.29	1
Tetrachloroethene	ND		ug/kg	0.94	0.28	1
Chlorobenzene	ND		ug/kg	0.94	0.32	1
Trichlorofluoromethane	ND		ug/kg	4.7	0.39	1
1,2-Dichloroethane	ND		ug/kg	0.94	0.23	1
1,1,1-Trichloroethane	ND		ug/kg	0.94	0.33	1
Bromodichloromethane	ND		ug/kg	0.94	0.29	1
trans-1,3-Dichloropropene	ND		ug/kg	0.94	0.19	1
cis-1,3-Dichloropropene	ND		ug/kg	0.94	0.22	1
1,3-Dichloropropene, Total	ND		ug/kg	0.94	0.19	1
1,1-Dichloropropene	ND		ug/kg	4.7	0.31	1
Bromoform	ND		ug/kg	3.7	0.22	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	0.94	0.28	1
Benzene	ND		ug/kg	0.94	0.18	1
Toluene	ND		ug/kg	1.4	0.18	1
Ethylbenzene	ND		ug/kg	0.94	0.16	1
Chloromethane	ND		ug/kg	4.7	0.41	1
Bromomethane	ND		ug/kg	1.9	0.32	1
Vinyl chloride	ND		ug/kg	1.9	0.29	1
Chloroethane	ND		ug/kg	1.9	0.30	1
1,1-Dichloroethene	ND		ug/kg	0.94	0.35	1
trans-1,2-Dichloroethene	ND		ug/kg	1.4	0.22	1
Trichloroethene	ND		ug/kg	0.94	0.28	1
1,2-Dichlorobenzene	ND		ug/kg	4.7	0.17	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16 Date Collected: 12/14/17 11:45

Client ID: SB012 (6-8) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	4.7	0.20	1
1,4-Dichlorobenzene	ND		ug/kg	4.7	0.17	1
Methyl tert butyl ether	ND		ug/kg	1.9	0.14	1
p/m-Xylene	ND		ug/kg	1.9	0.33	1
o-Xylene	ND		ug/kg	1.9	0.32	1
Xylenes, Total	ND		ug/kg	1.9	0.32	1
cis-1,2-Dichloroethene	ND		ug/kg	0.94	0.32	1
1,2-Dichloroethene, Total	ND		ug/kg	0.94	0.22	1
Dibromomethane	ND		ug/kg	9.4	0.22	1
Styrene	ND		ug/kg	1.9	0.38	1
Dichlorodifluoromethane	ND		ug/kg	9.4	0.47	1
Acetone	ND		ug/kg	9.4	2.1	1
Carbon disulfide	ND		ug/kg	9.4	1.0	1
2-Butanone	ND		ug/kg	9.4	0.64	1
Vinyl acetate	ND		ug/kg	9.4	0.14	1
4-Methyl-2-pentanone	ND		ug/kg	9.4	0.23	1
1,2,3-Trichloropropane	ND		ug/kg	9.4	0.16	1
2-Hexanone	ND		ug/kg	9.4	0.62	1
Bromochloromethane	ND		ug/kg	4.7	0.33	1
2,2-Dichloropropane	ND		ug/kg	4.7	0.42	1
1,2-Dibromoethane	ND		ug/kg	3.7	0.19	1
1,3-Dichloropropane	ND		ug/kg	4.7	0.17	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	0.94	0.30	1
Bromobenzene	ND		ug/kg	4.7	0.20	1
n-Butylbenzene	ND		ug/kg	0.94	0.21	1
sec-Butylbenzene	ND		ug/kg	0.94	0.20	1
tert-Butylbenzene	ND		ug/kg	4.7	0.23	1
o-Chlorotoluene	ND		ug/kg	4.7	0.21	1
p-Chlorotoluene	ND		ug/kg	4.7	0.17	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	4.7	0.37	1
Hexachlorobutadiene	ND		ug/kg	4.7	0.32	1
Isopropylbenzene	ND		ug/kg	0.94	0.18	1
p-Isopropyltoluene	ND		ug/kg	0.94	0.19	1
Naphthalene	ND		ug/kg	4.7	0.13	1
Acrylonitrile	ND		ug/kg	9.4	0.48	1
n-Propylbenzene	ND		ug/kg	0.94	0.20	1
1,2,3-Trichlorobenzene	ND		ug/kg	4.7	0.23	1
1,2,4-Trichlorobenzene	ND		ug/kg	4.7	0.20	1
1,3,5-Trimethylbenzene	0.23	J	ug/kg	4.7	0.15	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16 Date Collected: 12/14/17 11:45

Client ID: SB012 (6-8) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	0.57	J	ug/kg	4.7	0.17	1
1,4-Dioxane	ND		ug/kg	37	13.	1
p-Diethylbenzene	ND		ug/kg	3.7	3.7	1
p-Ethyltoluene	0.59	J	ug/kg	3.7	0.22	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	3.7	0.15	1
Ethyl ether	ND		ug/kg	4.7	0.24	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	4.7	0.37	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	102		70-130
4-Bromofluorobenzene	100		70-130
Dibromofluoromethane	99		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17
Client ID: DUP002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 00:00
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Soil
Analytical Method: 1,8260C
Analytical Date: 12/24/17 11:16
Analyst: MV
Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
Methylene chloride	ND		ug/kg	12	2.1	1
1,1-Dichloroethane	ND		ug/kg	1.9	0.34	1
Chloroform	ND		ug/kg	1.9	0.46	1
Carbon tetrachloride	ND		ug/kg	1.2	0.43	1
1,2-Dichloropropane	ND		ug/kg	4.4	0.28	1
Dibromochloromethane	ND		ug/kg	1.2	0.22	1
1,1,2-Trichloroethane	ND		ug/kg	1.9	0.39	1
Tetrachloroethene	ND		ug/kg	1.2	0.38	1
Chlorobenzene	ND		ug/kg	1.2	0.44	1
Trichlorofluoromethane	ND		ug/kg	6.3	0.52	1
1,2-Dichloroethane	ND		ug/kg	1.2	0.31	1
1,1,1-Trichloroethane	ND		ug/kg	1.2	0.44	1
Bromodichloromethane	ND		ug/kg	1.2	0.38	1
trans-1,3-Dichloropropene	ND		ug/kg	1.2	0.26	1
cis-1,3-Dichloropropene	ND		ug/kg	1.2	0.29	1
1,3-Dichloropropene, Total	ND		ug/kg	1.2	0.26	1
1,1-Dichloropropene	ND		ug/kg	6.3	0.41	1
Bromoform	ND		ug/kg	5.0	0.30	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.2	0.37	1
Benzene	ND		ug/kg	1.2	0.24	1
Toluene	0.26	J	ug/kg	1.9	0.24	1
Ethylbenzene	0.46	J	ug/kg	1.2	0.21	1
Chloromethane	ND		ug/kg	6.3	0.54	1
Bromomethane	ND		ug/kg	2.5	0.42	1
Vinyl chloride	ND		ug/kg	2.5	0.39	1
Chloroethane	ND		ug/kg	2.5	0.40	1
1,1-Dichloroethene	ND		ug/kg	1.2	0.46	1
trans-1,2-Dichloroethene	ND		ug/kg	1.9	0.30	1
Trichloroethene	ND		ug/kg	1.2	0.38	1
1,2-Dichlorobenzene	ND		ug/kg	6.3	0.23	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17 Date Collected: 12/14/17 00:00

Client ID: DUP002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/kg	6.3	0.27	1
1,4-Dichlorobenzene	ND		ug/kg	6.3	0.23	1
Methyl tert butyl ether	ND		ug/kg	2.5	0.19	1
p/m-Xylene	0.82	J	ug/kg	2.5	0.44	1
o-Xylene	ND		ug/kg	2.5	0.42	1
Xylenes, Total	0.82	J	ug/kg	2.5	0.42	1
cis-1,2-Dichloroethene	ND		ug/kg	1.2	0.43	1
1,2-Dichloroethene, Total	ND		ug/kg	1.2	0.30	1
Dibromomethane	ND		ug/kg	12	0.30	1
Styrene	ND		ug/kg	2.5	0.50	1
Dichlorodifluoromethane	ND		ug/kg	12	0.63	1
Acetone	17		ug/kg	12	2.9	1
Carbon disulfide	ND		ug/kg	12	1.4	1
2-Butanone	ND		ug/kg	12	0.86	1
Vinyl acetate	ND		ug/kg	12	0.19	1
4-Methyl-2-pentanone	ND		ug/kg	12	0.30	1
1,2,3-Trichloropropane	ND		ug/kg	12	0.22	1
2-Hexanone	ND		ug/kg	12	0.83	1
Bromochloromethane	ND		ug/kg	6.3	0.45	1
2,2-Dichloropropane	ND		ug/kg	6.3	0.56	1
1,2-Dibromoethane	ND		ug/kg	5.0	0.25	1
1,3-Dichloropropane	ND		ug/kg	6.3	0.23	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.2	0.40	1
Bromobenzene	ND		ug/kg	6.3	0.27	1
n-Butylbenzene	ND		ug/kg	1.2	0.28	1
sec-Butylbenzene	ND		ug/kg	1.2	0.27	1
tert-Butylbenzene	ND		ug/kg	6.3	0.31	1
o-Chlorotoluene	ND		ug/kg	6.3	0.28	1
p-Chlorotoluene	ND		ug/kg	6.3	0.23	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	6.3	0.50	1
Hexachlorobutadiene	ND		ug/kg	6.3	0.44	1
Isopropylbenzene	ND		ug/kg	1.2	0.24	1
p-Isopropyltoluene	ND		ug/kg	1.2	0.25	1
Naphthalene	0.19	J	ug/kg	6.3	0.17	1
Acrylonitrile	ND		ug/kg	12	0.64	1
n-Propylbenzene	0.52	J	ug/kg	1.2	0.27	1
1,2,3-Trichlorobenzene	ND		ug/kg	6.3	0.31	1
1,2,4-Trichlorobenzene	ND		ug/kg	6.3	0.27	1
1,3,5-Trimethylbenzene	0.61	J	ug/kg	6.3	0.20	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17 Date Collected: 12/14/17 00:00

Client ID: DUP002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by 8260/5035 - Westborough Lab						
1,2,4-Trimethylbenzene	1.4	J	ug/kg	6.3	0.23	1
1,4-Dioxane	ND		ug/kg	50	18.	1
p-Diethylbenzene	ND		ug/kg	5.0	5.0	1
p-Ethyltoluene	1.5	J	ug/kg	5.0	0.29	1
1,2,4,5-Tetramethylbenzene	ND		ug/kg	5.0	0.20	1
Ethyl ether	ND		ug/kg	6.3	0.32	1
trans-1,4-Dichloro-2-butene	ND		ug/kg	6.3	0.49	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	109		70-130
4-Bromofluorobenzene	118		70-130
Dibromofluoromethane	100		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18
Client ID: FIELDBLANK002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 12:00
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 12/21/17 11:46
Analyst: BD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	2.5	0.70	1
1,1-Dichloroethane	ND		ug/l	2.5	0.70	1
Chloroform	ND		ug/l	2.5	0.70	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,1,2-Trichloroethane	ND		ug/l	1.5	0.50	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
Chlorobenzene	ND		ug/l	2.5	0.70	1
Trichlorofluoromethane	ND		ug/l	2.5	0.70	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	2.5	0.70	1
Bromodichloromethane	ND		ug/l	0.50	0.19	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1-Dichloropropene	ND		ug/l	2.5	0.70	1
Bromoform	ND		ug/l	2.0	0.65	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.17	1
Benzene	ND		ug/l	0.50	0.16	1
Toluene	ND		ug/l	2.5	0.70	1
Ethylbenzene	ND		ug/l	2.5	0.70	1
Chloromethane	ND		ug/l	2.5	0.70	1
Bromomethane	ND		ug/l	2.5	0.70	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Chloroethane	ND		ug/l	2.5	0.70	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
trans-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18 Date Collected: 12/14/17 12:00

Client ID: FIELDBLANK002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/l	2.5	0.70	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.70	1
Methyl tert butyl ether	ND		ug/l	2.5	0.70	1
p/m-Xylene	ND		ug/l	2.5	0.70	1
o-Xylene	ND		ug/l	2.5	0.70	1
Xylenes, Total	ND		ug/l	2.5	0.70	1
cis-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
1,2-Dichloroethene, Total	ND		ug/l	2.5	0.70	1
Dibromomethane	ND		ug/l	5.0	1.0	1
1,2,3-Trichloropropane	ND		ug/l	2.5	0.70	1
Acrylonitrile	ND		ug/l	5.0	1.5	1
Styrene	ND		ug/l	2.5	0.70	1
Dichlorodifluoromethane	ND		ug/l	5.0	1.0	1
Acetone	ND		ug/l	5.0	1.5	1
Carbon disulfide	ND		ug/l	5.0	1.0	1
2-Butanone	ND		ug/l	5.0	1.9	1
Vinyl acetate	ND		ug/l	5.0	1.0	1
4-Methyl-2-pentanone	ND		ug/l	5.0	1.0	1
2-Hexanone	ND		ug/l	5.0	1.0	1
Bromochloromethane	ND		ug/l	2.5	0.70	1
2,2-Dichloropropane	ND		ug/l	2.5	0.70	1
1,2-Dibromoethane	ND		ug/l	2.0	0.65	1
1,3-Dichloropropane	ND		ug/l	2.5	0.70	1
1,1,1,2-Tetrachloroethane	ND		ug/l	2.5	0.70	1
Bromobenzene	ND		ug/l	2.5	0.70	1
n-Butylbenzene	ND		ug/l	2.5	0.70	1
sec-Butylbenzene	ND		ug/l	2.5	0.70	1
tert-Butylbenzene	ND		ug/l	2.5	0.70	1
o-Chlorotoluene	ND		ug/l	2.5	0.70	1
p-Chlorotoluene	ND		ug/l	2.5	0.70	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.70	1
Hexachlorobutadiene	ND		ug/l	2.5	0.70	1
Isopropylbenzene	ND		ug/l	2.5	0.70	1
p-Isopropyltoluene	ND		ug/l	2.5	0.70	1
Naphthalene	ND		ug/l	2.5	0.70	1
n-Propylbenzene	ND		ug/l	2.5	0.70	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18 Date Collected: 12/14/17 12:00

Client ID: FIELDBLANK002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/l	2.5	0.70	1
1,4-Dioxane	ND		ug/l	250	61.	1
p-Diethylbenzene	ND		ug/l	2.0	0.70	1
p-Ethyltoluene	ND		ug/l	2.0	0.70	1
1,2,4,5-Tetramethylbenzene	ND		ug/l	2.0	0.54	1
Ethyl ether	ND		ug/l	2.5	0.70	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	0.70	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	96		70-130
Toluene-d8	109		70-130
4-Bromofluorobenzene	114		70-130
Dibromofluoromethane	90		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-19
Client ID: TRIP BLANK
Sample Location: 718 E. 212TH STREET, BRONX, NY

Date Collected: 12/14/17 00:00
Date Received: 12/14/17
Field Prep: Not Specified

Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 12/21/17 12:13
Analyst: BD

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	2.5	0.70	1
1,1-Dichloroethane	ND		ug/l	2.5	0.70	1
Chloroform	ND		ug/l	2.5	0.70	1
Carbon tetrachloride	ND		ug/l	0.50	0.13	1
1,2-Dichloropropane	ND		ug/l	1.0	0.14	1
Dibromochloromethane	ND		ug/l	0.50	0.15	1
1,1,2-Trichloroethane	ND		ug/l	1.5	0.50	1
Tetrachloroethene	ND		ug/l	0.50	0.18	1
Chlorobenzene	ND		ug/l	2.5	0.70	1
Trichlorofluoromethane	ND		ug/l	2.5	0.70	1
1,2-Dichloroethane	ND		ug/l	0.50	0.13	1
1,1,1-Trichloroethane	ND		ug/l	2.5	0.70	1
Bromodichloromethane	ND		ug/l	0.50	0.19	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14	1
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14	1
1,1-Dichloropropene	ND		ug/l	2.5	0.70	1
Bromoform	ND		ug/l	2.0	0.65	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.17	1
Benzene	ND		ug/l	0.50	0.16	1
Toluene	ND		ug/l	2.5	0.70	1
Ethylbenzene	ND		ug/l	2.5	0.70	1
Chloromethane	ND		ug/l	2.5	0.70	1
Bromomethane	ND		ug/l	2.5	0.70	1
Vinyl chloride	ND		ug/l	1.0	0.07	1
Chloroethane	ND		ug/l	2.5	0.70	1
1,1-Dichloroethene	ND		ug/l	0.50	0.17	1
trans-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
Trichloroethene	ND		ug/l	0.50	0.18	1
1,2-Dichlorobenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-19 Date Collected: 12/14/17 00:00

Client ID: TRIP BLANK Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,3-Dichlorobenzene	ND		ug/l	2.5	0.70	1
1,4-Dichlorobenzene	ND		ug/l	2.5	0.70	1
Methyl tert butyl ether	ND		ug/l	2.5	0.70	1
p/m-Xylene	ND		ug/l	2.5	0.70	1
o-Xylene	ND		ug/l	2.5	0.70	1
Xylenes, Total	ND		ug/l	2.5	0.70	1
cis-1,2-Dichloroethene	ND		ug/l	2.5	0.70	1
1,2-Dichloroethene, Total	ND		ug/l	2.5	0.70	1
Dibromomethane	ND		ug/l	5.0	1.0	1
1,2,3-Trichloropropane	ND		ug/l	2.5	0.70	1
Acrylonitrile	ND		ug/l	5.0	1.5	1
Styrene	ND		ug/l	2.5	0.70	1
Dichlorodifluoromethane	ND		ug/l	5.0	1.0	1
Acetone	ND		ug/l	5.0	1.5	1
Carbon disulfide	ND		ug/l	5.0	1.0	1
2-Butanone	ND		ug/l	5.0	1.9	1
Vinyl acetate	ND		ug/l	5.0	1.0	1
4-Methyl-2-pentanone	ND		ug/l	5.0	1.0	1
2-Hexanone	ND		ug/l	5.0	1.0	1
Bromochloromethane	ND		ug/l	2.5	0.70	1
2,2-Dichloropropane	ND		ug/l	2.5	0.70	1
1,2-Dibromoethane	ND		ug/l	2.0	0.65	1
1,3-Dichloropropane	ND		ug/l	2.5	0.70	1
1,1,1,2-Tetrachloroethane	ND		ug/l	2.5	0.70	1
Bromobenzene	ND		ug/l	2.5	0.70	1
n-Butylbenzene	ND		ug/l	2.5	0.70	1
sec-Butylbenzene	ND		ug/l	2.5	0.70	1
tert-Butylbenzene	ND		ug/l	2.5	0.70	1
o-Chlorotoluene	ND		ug/l	2.5	0.70	1
p-Chlorotoluene	ND		ug/l	2.5	0.70	1
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.70	1
Hexachlorobutadiene	ND		ug/l	2.5	0.70	1
Isopropylbenzene	ND		ug/l	2.5	0.70	1
p-Isopropyltoluene	ND		ug/l	2.5	0.70	1
Naphthalene	ND		ug/l	2.5	0.70	1
n-Propylbenzene	ND		ug/l	2.5	0.70	1
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.70	1
1,3,5-Trimethylbenzene	ND		ug/l	2.5	0.70	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-19 Date Collected: 12/14/17 00:00

Client ID: TRIP BLANK Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
1,2,4-Trimethylbenzene	ND		ug/l	2.5	0.70	1
1,4-Dioxane	ND		ug/l	250	61.	1
p-Diethylbenzene	ND		ug/l	2.0	0.70	1
p-Ethyltoluene	ND		ug/l	2.0	0.70	1
1,2,4,5-Tetramethylbenzene	ND		ug/l	2.0	0.54	1
Ethyl ether	ND		ug/l	2.5	0.70	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	0.70	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	95		70-130
Toluene-d8	109		70-130
4-Bromofluorobenzene	114		70-130
Dibromofluoromethane	89		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/21/17 09:00
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 18-19 Batch: WG1075601-5					
Methylene chloride	ND		ug/l	2.5	0.70
1,1-Dichloroethane	ND		ug/l	2.5	0.70
Chloroform	ND		ug/l	2.5	0.70
Carbon tetrachloride	ND		ug/l	0.50	0.13
1,2-Dichloropropane	ND		ug/l	1.0	0.14
Dibromochloromethane	ND		ug/l	0.50	0.15
1,1,2-Trichloroethane	ND		ug/l	1.5	0.50
Tetrachloroethene	ND		ug/l	0.50	0.18
Chlorobenzene	ND		ug/l	2.5	0.70
Trichlorofluoromethane	ND		ug/l	2.5	0.70
1,2-Dichloroethane	ND		ug/l	0.50	0.13
1,1,1-Trichloroethane	ND		ug/l	2.5	0.70
Bromodichloromethane	ND		ug/l	0.50	0.19
trans-1,3-Dichloropropene	ND		ug/l	0.50	0.16
cis-1,3-Dichloropropene	ND		ug/l	0.50	0.14
1,3-Dichloropropene, Total	ND		ug/l	0.50	0.14
1,1-Dichloropropene	ND		ug/l	2.5	0.70
Bromoform	ND		ug/l	2.0	0.65
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	0.17
Benzene	ND		ug/l	0.50	0.16
Toluene	ND		ug/l	2.5	0.70
Ethylbenzene	ND		ug/l	2.5	0.70
Chloromethane	ND		ug/l	2.5	0.70
Bromomethane	ND		ug/l	2.5	0.70
Vinyl chloride	ND		ug/l	1.0	0.07
Chloroethane	ND		ug/l	2.5	0.70
1,1-Dichloroethene	ND		ug/l	0.50	0.17
trans-1,2-Dichloroethene	ND		ug/l	2.5	0.70
Trichloroethene	ND		ug/l	0.50	0.18

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/21/17 09:00
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 18-19 Batch: WG1075601-5					
1,2-Dichlorobenzene	ND		ug/l	2.5	0.70
1,3-Dichlorobenzene	ND		ug/l	2.5	0.70
1,4-Dichlorobenzene	ND		ug/l	2.5	0.70
Methyl tert butyl ether	ND		ug/l	2.5	0.70
p/m-Xylene	ND		ug/l	2.5	0.70
o-Xylene	ND		ug/l	2.5	0.70
Xylenes, Total	ND		ug/l	2.5	0.70
cis-1,2-Dichloroethene	ND		ug/l	2.5	0.70
1,2-Dichloroethene, Total	ND		ug/l	2.5	0.70
Dibromomethane	ND		ug/l	5.0	1.0
1,2,3-Trichloropropane	ND		ug/l	2.5	0.70
Acrylonitrile	ND		ug/l	5.0	1.5
Styrene	ND		ug/l	2.5	0.70
Dichlorodifluoromethane	ND		ug/l	5.0	1.0
Acetone	ND		ug/l	5.0	1.5
Carbon disulfide	ND		ug/l	5.0	1.0
2-Butanone	ND		ug/l	5.0	1.9
Vinyl acetate	ND		ug/l	5.0	1.0
4-Methyl-2-pentanone	ND		ug/l	5.0	1.0
2-Hexanone	ND		ug/l	5.0	1.0
Bromochloromethane	ND		ug/l	2.5	0.70
2,2-Dichloropropane	ND		ug/l	2.5	0.70
1,2-Dibromoethane	ND		ug/l	2.0	0.65
1,3-Dichloropropane	ND		ug/l	2.5	0.70
1,1,1,2-Tetrachloroethane	ND		ug/l	2.5	0.70
Bromobenzene	ND		ug/l	2.5	0.70
n-Butylbenzene	ND		ug/l	2.5	0.70
sec-Butylbenzene	ND		ug/l	2.5	0.70
tert-Butylbenzene	ND		ug/l	2.5	0.70

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/21/17 09:00
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 18-19 Batch: WG1075601-5					
o-Chlorotoluene	ND		ug/l	2.5	0.70
p-Chlorotoluene	ND		ug/l	2.5	0.70
1,2-Dibromo-3-chloropropane	ND		ug/l	2.5	0.70
Hexachlorobutadiene	ND		ug/l	2.5	0.70
Isopropylbenzene	ND		ug/l	2.5	0.70
p-Isopropyltoluene	ND		ug/l	2.5	0.70
Naphthalene	ND		ug/l	2.5	0.70
n-Propylbenzene	ND		ug/l	2.5	0.70
1,2,3-Trichlorobenzene	ND		ug/l	2.5	0.70
1,2,4-Trichlorobenzene	ND		ug/l	2.5	0.70
1,3,5-Trimethylbenzene	ND		ug/l	2.5	0.70
1,2,4-Trimethylbenzene	ND		ug/l	2.5	0.70
1,4-Dioxane	ND		ug/l	250	61.
p-Diethylbenzene	ND		ug/l	2.0	0.70
p-Ethyltoluene	ND		ug/l	2.0	0.70
1,2,4,5-Tetramethylbenzene	ND		ug/l	2.0	0.54
Ethyl ether	ND		ug/l	2.5	0.70
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	0.70

Tentatively Identified Compounds

No Tentatively Identified Compounds	ND	ug/l

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/21/17 09:00
Analyst: PD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 18-19 Batch: WG1075601-5					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	94		70-130
Toluene-d8	110		70-130
4-Bromofluorobenzene	114		70-130
Dibromofluoromethane	90		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/21/17 20:25
Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02,04-08 Batch: WG1075729-5					
Methylene chloride	ND		ug/kg	10	1.6
1,1-Dichloroethane	ND		ug/kg	1.5	0.27
Chloroform	ND		ug/kg	1.5	0.37
Carbon tetrachloride	ND		ug/kg	1.0	0.34
1,2-Dichloropropane	ND		ug/kg	3.5	0.23
Dibromochloromethane	ND		ug/kg	1.0	0.18
1,1,2-Trichloroethane	ND		ug/kg	1.5	0.31
Tetrachloroethene	ND		ug/kg	1.0	0.30
Chlorobenzene	ND		ug/kg	1.0	0.35
Trichlorofluoromethane	ND		ug/kg	5.0	0.42
1,2-Dichloroethane	ND		ug/kg	1.0	0.25
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.35
Bromodichloromethane	ND		ug/kg	1.0	0.31
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.21
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.23
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.21
1,1-Dichloropropene	ND		ug/kg	5.0	0.33
Bromoform	ND		ug/kg	4.0	0.24
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.30
Benzene	ND		ug/kg	1.0	0.19
Toluene	ND		ug/kg	1.5	0.20
Ethylbenzene	ND		ug/kg	1.0	0.17
Chloromethane	ND		ug/kg	5.0	0.44
Bromomethane	ND		ug/kg	2.0	0.34
Vinyl chloride	ND		ug/kg	2.0	0.32
Chloroethane	ND		ug/kg	2.0	0.32
1,1-Dichloroethene	ND		ug/kg	1.0	0.37
trans-1,2-Dichloroethene	ND		ug/kg	1.5	0.24
Trichloroethene	ND		ug/kg	1.0	0.30

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/21/17 20:25
Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02,04-08 Batch: WG1075729-5					
1,2-Dichlorobenzene	ND		ug/kg	5.0	0.18
1,3-Dichlorobenzene	ND		ug/kg	5.0	0.22
1,4-Dichlorobenzene	ND		ug/kg	5.0	0.18
Methyl tert butyl ether	ND		ug/kg	2.0	0.15
p/m-Xylene	ND		ug/kg	2.0	0.35
o-Xylene	ND		ug/kg	2.0	0.34
Xylenes, Total	ND		ug/kg	2.0	0.34
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.34
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.24
Dibromomethane	ND		ug/kg	10	0.24
Styrene	ND		ug/kg	2.0	0.40
Dichlorodifluoromethane	ND		ug/kg	10	0.50
Acetone	ND		ug/kg	10	2.3
Carbon disulfide	ND		ug/kg	10	1.1
2-Butanone	ND		ug/kg	10	0.69
Vinyl acetate	ND		ug/kg	10	0.15
4-Methyl-2-pentanone	ND		ug/kg	10	0.24
1,2,3-Trichloropropane	ND		ug/kg	10	0.18
2-Hexanone	ND		ug/kg	10	0.67
Bromochloromethane	ND		ug/kg	5.0	0.36
2,2-Dichloropropane	ND		ug/kg	5.0	0.45
1,2-Dibromoethane	ND		ug/kg	4.0	0.20
1,3-Dichloropropane	ND		ug/kg	5.0	0.18
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.32
Bromobenzene	ND		ug/kg	5.0	0.22
n-Butylbenzene	ND		ug/kg	1.0	0.23
sec-Butylbenzene	ND		ug/kg	1.0	0.22
tert-Butylbenzene	ND		ug/kg	5.0	0.25
o-Chlorotoluene	ND		ug/kg	5.0	0.22

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/21/17 20:25
Analyst: AD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 01-02,04-08 Batch: WG1075729-5					
p-Chlorotoluene	ND		ug/kg	5.0	0.18
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.0	0.40
Hexachlorobutadiene	ND		ug/kg	5.0	0.35
Isopropylbenzene	ND		ug/kg	1.0	0.19
p-Isopropyltoluene	ND		ug/kg	1.0	0.20
Naphthalene	ND		ug/kg	5.0	0.14
Acrylonitrile	ND		ug/kg	10	0.51
n-Propylbenzene	ND		ug/kg	1.0	0.22
1,2,3-Trichlorobenzene	ND		ug/kg	5.0	0.25
1,2,4-Trichlorobenzene	ND		ug/kg	5.0	0.22
1,3,5-Trimethylbenzene	ND		ug/kg	5.0	0.16
1,2,4-Trimethylbenzene	ND		ug/kg	5.0	0.19
1,4-Dioxane	ND		ug/kg	40	14.
p-Diethylbenzene	ND		ug/kg	4.0	4.0
p-Ethyltoluene	ND		ug/kg	4.0	0.23
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.0	0.16
Ethyl ether	ND		ug/kg	5.0	0.26
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.0	0.39

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	94		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	101		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/24/17 10:50
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 03,17 Batch: WG1076365-10					
Methylene chloride	ND		ug/kg	10	1.6
1,1-Dichloroethane	ND		ug/kg	1.5	0.27
Chloroform	ND		ug/kg	1.5	0.37
Carbon tetrachloride	ND		ug/kg	1.0	0.34
1,2-Dichloropropane	ND		ug/kg	3.5	0.23
Dibromochloromethane	ND		ug/kg	1.0	0.18
1,1,2-Trichloroethane	ND		ug/kg	1.5	0.31
Tetrachloroethene	ND		ug/kg	1.0	0.30
Chlorobenzene	ND		ug/kg	1.0	0.35
Trichlorofluoromethane	ND		ug/kg	5.0	0.42
1,2-Dichloroethane	ND		ug/kg	1.0	0.25
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.35
Bromodichloromethane	ND		ug/kg	1.0	0.31
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.21
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.23
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.21
1,1-Dichloropropene	ND		ug/kg	5.0	0.33
Bromoform	ND		ug/kg	4.0	0.24
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.30
Benzene	ND		ug/kg	1.0	0.19
Toluene	ND		ug/kg	1.5	0.20
Ethylbenzene	0.19	J	ug/kg	1.0	0.17
Chloromethane	ND		ug/kg	5.0	0.44
Bromomethane	ND		ug/kg	2.0	0.34
Vinyl chloride	ND		ug/kg	2.0	0.32
Chloroethane	ND		ug/kg	2.0	0.32
1,1-Dichloroethene	ND		ug/kg	1.0	0.37
trans-1,2-Dichloroethene	ND		ug/kg	1.5	0.24
Trichloroethene	ND		ug/kg	1.0	0.30

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/24/17 10:50
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 03,17 Batch: WG1076365-10					
1,2-Dichlorobenzene	ND		ug/kg	5.0	0.18
1,3-Dichlorobenzene	ND		ug/kg	5.0	0.22
1,4-Dichlorobenzene	ND		ug/kg	5.0	0.18
Methyl tert butyl ether	ND		ug/kg	2.0	0.15
p/m-Xylene	0.48	J	ug/kg	2.0	0.35
o-Xylene	ND		ug/kg	2.0	0.34
Xylenes, Total	0.48	J	ug/kg	2.0	0.34
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.34
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.24
Dibromomethane	ND		ug/kg	10	0.24
Styrene	ND		ug/kg	2.0	0.40
Dichlorodifluoromethane	ND		ug/kg	10	0.50
Acetone	ND		ug/kg	10	2.3
Carbon disulfide	ND		ug/kg	10	1.1
2-Butanone	ND		ug/kg	10	0.69
Vinyl acetate	ND		ug/kg	10	0.15
4-Methyl-2-pentanone	ND		ug/kg	10	0.24
1,2,3-Trichloropropane	ND		ug/kg	10	0.18
2-Hexanone	ND		ug/kg	10	0.67
Bromochloromethane	ND		ug/kg	5.0	0.36
2,2-Dichloropropane	ND		ug/kg	5.0	0.45
1,2-Dibromoethane	ND		ug/kg	4.0	0.20
1,3-Dichloropropane	ND		ug/kg	5.0	0.18
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.32
Bromobenzene	ND		ug/kg	5.0	0.22
n-Butylbenzene	ND		ug/kg	1.0	0.23
sec-Butylbenzene	ND		ug/kg	1.0	0.22
tert-Butylbenzene	ND		ug/kg	5.0	0.25
o-Chlorotoluene	ND		ug/kg	5.0	0.22

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 12/24/17 10:50
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 03,17 Batch: WG1076365-10					
p-Chlorotoluene	ND		ug/kg	5.0	0.18
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.0	0.40
Hexachlorobutadiene	ND		ug/kg	5.0	0.35
Isopropylbenzene	ND		ug/kg	1.0	0.19
p-Isopropyltoluene	ND		ug/kg	1.0	0.20
Naphthalene	ND		ug/kg	5.0	0.14
Acrylonitrile	ND		ug/kg	10	0.51
n-Propylbenzene	0.30	J	ug/kg	1.0	0.22
1,2,3-Trichlorobenzene	ND		ug/kg	5.0	0.25
1,2,4-Trichlorobenzene	ND		ug/kg	5.0	0.22
1,3,5-Trimethylbenzene	0.36	J	ug/kg	5.0	0.16
1,2,4-Trimethylbenzene	0.80	J	ug/kg	5.0	0.19
1,4-Dioxane	ND		ug/kg	40	14.
p-Diethylbenzene	ND		ug/kg	4.0	4.0
p-Ethyltoluene	0.84	J	ug/kg	4.0	0.23
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.0	0.16
Ethyl ether	ND		ug/kg	5.0	0.26
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.0	0.39

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	106		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	99		70-130

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

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Analyst: BD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 09-16 Batch: WG1076365-5					
Methylene chloride	ND		ug/kg	10	1.6
1,1-Dichloroethane	ND		ug/kg	1.5	0.27
Chloroform	ND		ug/kg	1.5	0.37
Carbon tetrachloride	ND		ug/kg	1.0	0.34
1,2-Dichloropropane	ND		ug/kg	3.5	0.23
Dibromochloromethane	ND		ug/kg	1.0	0.18
1,1,2-Trichloroethane	ND		ug/kg	1.5	0.31
Tetrachloroethene	ND		ug/kg	1.0	0.30
Chlorobenzene	ND		ug/kg	1.0	0.35
Trichlorofluoromethane	ND		ug/kg	5.0	0.42
1,2-Dichloroethane	ND		ug/kg	1.0	0.25
1,1,1-Trichloroethane	ND		ug/kg	1.0	0.35
Bromodichloromethane	ND		ug/kg	1.0	0.31
trans-1,3-Dichloropropene	ND		ug/kg	1.0	0.21
cis-1,3-Dichloropropene	ND		ug/kg	1.0	0.23
1,3-Dichloropropene, Total	ND		ug/kg	1.0	0.21
1,1-Dichloropropene	ND		ug/kg	5.0	0.33
Bromoform	ND		ug/kg	4.0	0.24
1,1,2,2-Tetrachloroethane	ND		ug/kg	1.0	0.30
Benzene	ND		ug/kg	1.0	0.19
Toluene	ND		ug/kg	1.5	0.20
Ethylbenzene	0.22	J	ug/kg	1.0	0.17
Chloromethane	ND		ug/kg	5.0	0.44
Bromomethane	ND		ug/kg	2.0	0.34
Vinyl chloride	ND		ug/kg	2.0	0.32
Chloroethane	ND		ug/kg	2.0	0.32
1,1-Dichloroethene	ND		ug/kg	1.0	0.37
trans-1,2-Dichloroethene	ND		ug/kg	1.5	0.24
Trichloroethene	ND		ug/kg	1.0	0.30

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Analyst: BD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 09-16 Batch: WG1076365-5					
1,2-Dichlorobenzene	ND		ug/kg	5.0	0.18
1,3-Dichlorobenzene	ND		ug/kg	5.0	0.22
1,4-Dichlorobenzene	ND		ug/kg	5.0	0.18
Methyl tert butyl ether	ND		ug/kg	2.0	0.15
p/m-Xylene	0.54	J	ug/kg	2.0	0.35
o-Xylene	ND		ug/kg	2.0	0.34
Xylenes, Total	0.54	J	ug/kg	2.0	0.34
cis-1,2-Dichloroethene	ND		ug/kg	1.0	0.34
1,2-Dichloroethene, Total	ND		ug/kg	1.0	0.24
Dibromomethane	ND		ug/kg	10	0.24
Styrene	ND		ug/kg	2.0	0.40
Dichlorodifluoromethane	ND		ug/kg	10	0.50
Acetone	ND		ug/kg	10	2.3
Carbon disulfide	ND		ug/kg	10	1.1
2-Butanone	ND		ug/kg	10	0.69
Vinyl acetate	ND		ug/kg	10	0.15
4-Methyl-2-pentanone	ND		ug/kg	10	0.24
1,2,3-Trichloropropane	ND		ug/kg	10	0.18
2-Hexanone	ND		ug/kg	10	0.67
Bromochloromethane	ND		ug/kg	5.0	0.36
2,2-Dichloropropane	ND		ug/kg	5.0	0.45
1,2-Dibromoethane	ND		ug/kg	4.0	0.20
1,3-Dichloropropane	ND		ug/kg	5.0	0.18
1,1,1,2-Tetrachloroethane	ND		ug/kg	1.0	0.32
Bromobenzene	ND		ug/kg	5.0	0.22
n-Butylbenzene	ND		ug/kg	1.0	0.23
sec-Butylbenzene	ND		ug/kg	1.0	0.22
tert-Butylbenzene	ND		ug/kg	5.0	0.25
o-Chlorotoluene	ND		ug/kg	5.0	0.22

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Analyst: BD

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by 8260/5035 - Westborough Lab for sample(s): 09-16 Batch: WG1076365-5					
p-Chlorotoluene	ND		ug/kg	5.0	0.18
1,2-Dibromo-3-chloropropane	ND		ug/kg	5.0	0.40
Hexachlorobutadiene	ND		ug/kg	5.0	0.35
Isopropylbenzene	ND		ug/kg	1.0	0.19
p-Isopropyltoluene	ND		ug/kg	1.0	0.20
Naphthalene	ND		ug/kg	5.0	0.14
Acrylonitrile	ND		ug/kg	10	0.51
n-Propylbenzene	0.33	J	ug/kg	1.0	0.22
1,2,3-Trichlorobenzene	ND		ug/kg	5.0	0.25
1,2,4-Trichlorobenzene	ND		ug/kg	5.0	0.22
1,3,5-Trimethylbenzene	0.44	J	ug/kg	5.0	0.16
1,2,4-Trimethylbenzene	0.98	J	ug/kg	5.0	0.19
1,4-Dioxane	ND		ug/kg	40	14.
p-Diethylbenzene	ND		ug/kg	4.0	4.0
p-Ethyltoluene	1.0	J	ug/kg	4.0	0.23
1,2,4,5-Tetramethylbenzene	ND		ug/kg	4.0	0.16
Ethyl ether	ND		ug/kg	5.0	0.26
trans-1,4-Dichloro-2-butene	ND		ug/kg	5.0	0.39

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	104		70-130
Toluene-d8	104		70-130
4-Bromofluorobenzene	103		70-130
Dibromofluoromethane	97		70-130

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Batch Quality Control

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Analyst: CBN

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 07 Batch: WG1076454-5					
Methylene chloride	ND		ug/kg	500	82.
1,1-Dichloroethane	ND		ug/kg	75	14.
Chloroform	ND		ug/kg	75	18.
Carbon tetrachloride	ND		ug/kg	50	17.
1,2-Dichloropropane	ND		ug/kg	180	11.
Dibromochloromethane	ND		ug/kg	50	8.8
2-Chloroethylvinyl ether	ND		ug/kg	1000	31.
1,1,2-Trichloroethane	ND		ug/kg	75	16.
Tetrachloroethene	ND		ug/kg	50	15.
Chlorobenzene	ND		ug/kg	50	17.
Trichlorofluoromethane	ND		ug/kg	250	21.
1,2-Dichloroethane	ND		ug/kg	50	12.
1,1,1-Trichloroethane	ND		ug/kg	50	18.
Bromodichloromethane	ND		ug/kg	50	15.
trans-1,3-Dichloropropene	ND		ug/kg	50	10.
cis-1,3-Dichloropropene	ND		ug/kg	50	12.
1,3-Dichloropropene, Total	ND		ug/kg	50	10.
1,1-Dichloropropene	ND		ug/kg	250	16.
Bromoform	ND		ug/kg	200	12.
1,1,2,2-Tetrachloroethane	ND		ug/kg	50	15.
Benzene	ND		ug/kg	50	9.6
Toluene	ND		ug/kg	75	9.8
Ethylbenzene	ND		ug/kg	50	8.5
Chloromethane	ND		ug/kg	250	22.
Bromomethane	ND		ug/kg	100	17.
Vinyl chloride	ND		ug/kg	100	16.
Chloroethane	ND		ug/kg	100	16.
1,1-Dichloroethene	ND		ug/kg	50	19.
trans-1,2-Dichloroethene	ND		ug/kg	75	12.

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Analyst: CBN

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 07 Batch: WG1076454-5					
Trichloroethene	ND		ug/kg	50	15.
1,2-Dichlorobenzene	ND		ug/kg	250	9.1
1,3-Dichlorobenzene	ND		ug/kg	250	11.
1,4-Dichlorobenzene	ND		ug/kg	250	9.1
Methyl tert butyl ether	ND		ug/kg	100	7.6
p/m-Xylene	ND		ug/kg	100	18.
o-Xylene	ND		ug/kg	100	17.
Xylene (Total)	ND		ug/kg	100	17.
cis-1,2-Dichloroethene	ND		ug/kg	50	17.
1,2-Dichloroethene (total)	ND		ug/kg	50	12.
Dibromomethane	ND		ug/kg	500	12.
Styrene	ND		ug/kg	100	20.
Dichlorodifluoromethane	ND		ug/kg	500	25.
Acetone	ND		ug/kg	500	110
Carbon disulfide	ND		ug/kg	500	55.
2-Butanone	ND		ug/kg	500	34.
Vinyl acetate	ND		ug/kg	500	7.6
4-Methyl-2-pentanone	ND		ug/kg	500	12.
1,2,3-Trichloropropane	ND		ug/kg	500	8.8
2-Hexanone	ND		ug/kg	500	33.
Bromochloromethane	ND		ug/kg	250	18.
2,2-Dichloropropane	ND		ug/kg	250	22.
1,2-Dibromoethane	ND		ug/kg	200	10.
1,3-Dichloropropane	ND		ug/kg	250	9.2
1,1,1,2-Tetrachloroethane	ND		ug/kg	50	16.
Bromobenzene	ND		ug/kg	250	11.
n-Butylbenzene	ND		ug/kg	50	11.
sec-Butylbenzene	ND		ug/kg	50	11.
tert-Butylbenzene	ND		ug/kg	250	12.

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Analyst: CBN

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 07 Batch: WG1076454-5					
o-Chlorotoluene	ND		ug/kg	250	11.
p-Chlorotoluene	ND		ug/kg	250	9.2
1,2-Dibromo-3-chloropropane	ND		ug/kg	250	20.
Hexachlorobutadiene	ND		ug/kg	250	17.
Isopropylbenzene	ND		ug/kg	50	9.7
p-Isopropyltoluene	ND		ug/kg	50	10.
Naphthalene	ND		ug/kg	250	6.9
Acrylonitrile	ND		ug/kg	500	26.
Isopropyl Ether	ND		ug/kg	200	14.
tert-Butyl Alcohol	ND		ug/kg	3000	150
n-Propylbenzene	11	J	ug/kg	50	11.
1,2,3-Trichlorobenzene	ND		ug/kg	250	12.
1,2,4-Trichlorobenzene	ND		ug/kg	250	11.
1,3,5-Trimethylbenzene	12	J	ug/kg	250	8.0
1,2,4-Trimethylbenzene	23	J	ug/kg	250	9.3
Methyl Acetate	ND		ug/kg	1000	23.
Ethyl Acetate	ND		ug/kg	1000	100
Acrolein	ND		ug/kg	1200	400
Cyclohexane	ND		ug/kg	1000	22.
1,4-Dioxane	ND		ug/kg	2000	720
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND		ug/kg	1000	26.
1,4-Diethylbenzene	ND		ug/kg	200	200
4-Ethyltoluene	25	J	ug/kg	200	12.
1,2,4,5-Tetramethylbenzene	ND		ug/kg	200	7.8
Tetrahydrofuran	ND		ug/kg	1000	50.
Ethyl ether	ND		ug/kg	250	13.
trans-1,4-Dichloro-2-butene	ND		ug/kg	250	20.
Methyl cyclohexane	ND		ug/kg	200	12.
Ethyl-Tert-Butyl-Ether	ND		ug/kg	200	8.9

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Analyst: CBN

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 07 Batch: WG1076454-5					
Tertiary-Amyl Methyl Ether	ND		ug/kg	200	12.

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	105		70-130
Toluene-d8	103		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	100		70-130

Lab Control Sample Analysis

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 18-19 Batch: WG1075601-3 WG1075601-4								
Methylene chloride	90		87		70-130	3		20
1,1-Dichloroethane	100		98		70-130	2		20
Chloroform	89		87		70-130	2		20
Carbon tetrachloride	88		84		63-132	5		20
1,2-Dichloropropane	100		100		70-130	0		20
Dibromochloromethane	91		91		63-130	0		20
1,1,2-Trichloroethane	100		100		70-130	0		20
Tetrachloroethene	89		87		70-130	2		20
Chlorobenzene	99		98		75-130	1		20
Trichlorofluoromethane	85		81		62-150	5		20
1,2-Dichloroethane	92		89		70-130	3		20
1,1,1-Trichloroethane	85		81		67-130	5		20
Bromodichloromethane	84		81		67-130	4		20
trans-1,3-Dichloropropene	100		100		70-130	0		20
cis-1,3-Dichloropropene	93		89		70-130	4		20
1,1-Dichloropropene	92		88		70-130	4		20
Bromoform	62		62		54-136	0		20
1,1,2,2-Tetrachloroethane	110		120		67-130	9		20
Benzene	100		98		70-130	2		20
Toluene	110		110		70-130	0		20
Ethylbenzene	100		100		70-130	0		20
Chloromethane	110		100		64-130	10		20
Bromomethane	45		41		39-139	9		20

Lab Control Sample Analysis

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 18-19 Batch: WG1075601-3 WG1075601-4								
Vinyl chloride	87		81		55-140	7		20
Chloroethane	99		94		55-138	5		20
1,1-Dichloroethene	90		85		61-145	6		20
trans-1,2-Dichloroethene	87		84		70-130	4		20
Trichloroethene	91		89		70-130	2		20
1,2-Dichlorobenzene	110		110		70-130	0		20
1,3-Dichlorobenzene	110		110		70-130	0		20
1,4-Dichlorobenzene	110		110		70-130	0		20
Methyl tert butyl ether	83		83		63-130	0		20
p/m-Xylene	100		100		70-130	0		20
o-Xylene	115		115		70-130	0		20
cis-1,2-Dichloroethene	89		86		70-130	3		20
Dibromomethane	110		110		70-130	0		20
1,2,3-Trichloropropane	120		120		64-130	0		20
Acrylonitrile	110		110		70-130	0		20
Styrene	**50**	Q	**50**	Q	70-130	0		20
Dichlorodifluoromethane	86		82		36-147	5		20
Acetone	88		89		58-148	1		20
Carbon disulfide	92		88		51-130	4		20
2-Butanone	110		110		63-138	0		20
Vinyl acetate	99		98		70-130	1		20
4-Methyl-2-pentanone	100		110		59-130	10		20
2-Hexanone	110		120		57-130	9		20

Lab Control Sample Analysis
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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 18-19 Batch: WG1075601-3 WG1075601-4								
Bromochloromethane	88		86		70-130	2		20
2,2-Dichloropropane	93		88		63-133	6		20
1,2-Dibromoethane	92		95		70-130	3		20
1,3-Dichloropropane	110		110		70-130	0		20
1,1,1,2-Tetrachloroethane	99		97		64-130	2		20
Bromobenzene	110		100		70-130	10		20
n-Butylbenzene	120		120		53-136	0		20
sec-Butylbenzene	120		110		70-130	9		20
tert-Butylbenzene	110		110		70-130	0		20
o-Chlorotoluene	120		120		70-130	0		20
p-Chlorotoluene	120		120		70-130	0		20
1,2-Dibromo-3-chloropropane	87		88		41-144	1		20
Hexachlorobutadiene	74		72		63-130	3		20
Isopropylbenzene	120		110		70-130	9		20
p-Isopropyltoluene	120		120		70-130	0		20
Naphthalene	96		100		70-130	4		20
n-Propylbenzene	120		120		69-130	0		20
1,2,3-Trichlorobenzene	86		86		70-130	0		20
1,2,4-Trichlorobenzene	91		91		70-130	0		20
1,3,5-Trimethylbenzene	120		120		64-130	0		20
1,2,4-Trimethylbenzene	**140**	Q	**140**	Q	70-130	0		20
1,4-Dioxane	96		88		56-162	9		20
p-Diethylbenzene	120		110		70-130	9		20

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 18-19 Batch: WG1075601-3 WG1075601-4								
p-Ethyltoluene	120		120		70-130	0		20
1,2,4,5-Tetramethylbenzene	110		110		70-130	0		20
Ethyl ether	87		88		59-134	1		20
trans-1,4-Dichloro-2-butene	100		100		70-130	0		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	93		94		70-130
Toluene-d8	109		109		70-130
4-Bromofluorobenzene	112		113		70-130
Dibromofluoromethane	91		90		70-130

Lab Control Sample Analysis

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Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02,04-08 Batch: WG1075729-3 WG1075729-4								
Methylene chloride	84		87		70-130	4		30
1,1-Dichloroethane	118		120		70-130	2		30
Chloroform	105		108		70-130	3		30
Carbon tetrachloride	108		112		70-130	4		30
1,2-Dichloropropane	118		122		70-130	3		30
Dibromochloromethane	88		92		70-130	4		30
1,1,2-Trichloroethane	89		92		70-130	3		30
Tetrachloroethene	89		93		70-130	4		30
Chlorobenzene	87		89		70-130	2		30
Trichlorofluoromethane	97		100		70-139	3		30
1,2-Dichloroethane	113		118		70-130	4		30
1,1,1-Trichloroethane	107		112		70-130	5		30
Bromodichloromethane	103		107		70-130	4		30
trans-1,3-Dichloropropene	93		97		70-130	4		30
cis-1,3-Dichloropropene	110		114		70-130	4		30
1,1-Dichloropropene	108		111		70-130	3		30
Bromoform	83		88		70-130	6		30
1,1,2,2-Tetrachloroethane	78		83		70-130	6		30
Benzene	103		106		70-130	3		30
Toluene	84		86		70-130	2		30
Ethylbenzene	87		90		70-130	3		30
Chloromethane	111		113		52-130	2		30
Bromomethane	109		112		57-147	3		30

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Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02,04-08 Batch: WG1075729-3 WG1075729-4								
Vinyl chloride	97		99		67-130	2		30
Chloroethane	106		110		50-151	4		30
1,1-Dichloroethene	102		105		65-135	3		30
trans-1,2-Dichloroethene	104		107		70-130	3		30
Trichloroethene	106		109		70-130	3		30
1,2-Dichlorobenzene	79		81		70-130	3		30
1,3-Dichlorobenzene	80		81		70-130	1		30
1,4-Dichlorobenzene	79		81		70-130	3		30
Methyl tert butyl ether	110		115		66-130	4		30
p/m-Xylene	88		91		70-130	3		30
o-Xylene	91		94		70-130	3		30
cis-1,2-Dichloroethene	105		106		70-130	1		30
Dibromomethane	102		107		70-130	5		30
Styrene	85		89		70-130	5		30
Dichlorodifluoromethane	80		83		30-146	4		30
Acetone	123		132		54-140	7		30
Carbon disulfide	100		103		59-130	3		30
2-Butanone	107		119		70-130	11		30
Vinyl acetate	116		124		70-130	7		30
4-Methyl-2-pentanone	97		104		70-130	7		30
1,2,3-Trichloropropane	81		85		68-130	5		30
2-Hexanone	96		104		70-130	8		30
Bromochloromethane	108		113		70-130	5		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab	Associated sample(s): 01-02,04-08		Batch: WG1075729-3 WG1075729-4					
2,2-Dichloropropane	115		117		70-130	2		30
1,2-Dibromoethane	86		91		70-130	6		30
1,3-Dichloropropane	88		92		69-130	4		30
1,1,1,2-Tetrachloroethane	89		92		70-130	3		30
Bromobenzene	80		82		70-130	2		30
n-Butylbenzene	82		83		70-130	1		30
sec-Butylbenzene	80		83		70-130	4		30
tert-Butylbenzene	79		82		70-130	4		30
o-Chlorotoluene	85		86		70-130	1		30
p-Chlorotoluene	80		84		70-130	5		30
1,2-Dibromo-3-chloropropane	76		82		68-130	8		30
Hexachlorobutadiene	84		86		67-130	2		30
Isopropylbenzene	81		83		70-130	2		30
p-Isopropyltoluene	81		83		70-130	2		30
Naphthalene	82		86		70-130	5		30
Acrylonitrile	123		**144**	Q	70-130	16		30
n-Propylbenzene	80		82		70-130	2		30
1,2,3-Trichlorobenzene	84		86		70-130	2		30
1,2,4-Trichlorobenzene	85		85		70-130	0		30
1,3,5-Trimethylbenzene	82		84		70-130	2		30
1,2,4-Trimethylbenzene	81		83		70-130	2		30
1,4-Dioxane	113		120		65-136	6		30
p-Diethylbenzene	81		82		70-130	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 01-02,04-08 Batch: WG1075729-3 WG1075729-4								
p-Ethyltoluene	81		83		70-130	2		30
1,2,4,5-Tetramethylbenzene	80		81		70-130	1		30
Ethyl ether	109		111		67-130	2		30
trans-1,4-Dichloro-2-butene	92		100		70-130	8		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	104		105		70-130
Toluene-d8	94		94		70-130
4-Bromofluorobenzene	102		102		70-130
Dibromofluoromethane	107		106		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 09-16 Batch: WG1076365-3 WG1076365-4								
Methylene chloride	70		75		70-130	7		30
1,1-Dichloroethane	102		110		70-130	8		30
Chloroform	91		97		70-130	6		30
Carbon tetrachloride	95		100		70-130	5		30
1,2-Dichloropropane	102		109		70-130	7		30
Dibromochloromethane	94		98		70-130	4		30
1,1,2-Trichloroethane	93		97		70-130	4		30
Tetrachloroethene	97		103		70-130	6		30
Chlorobenzene	93		98		70-130	5		30
Trichlorofluoromethane	92		98		70-139	6		30
1,2-Dichloroethane	99		105		70-130	6		30
1,1,1-Trichloroethane	94		100		70-130	6		30
Bromodichloromethane	90		96		70-130	6		30
trans-1,3-Dichloropropene	101		105		70-130	4		30
cis-1,3-Dichloropropene	96		102		70-130	6		30
1,1-Dichloropropene	96		100		70-130	4		30
Bromoform	96		101		70-130	5		30
1,1,2,2-Tetrachloroethane	89		93		70-130	4		30
Benzene	89		94		70-130	5		30
Toluene	91		94		70-130	3		30
Ethylbenzene	94		99		70-130	5		30
Chloromethane	119		120		52-130	1		30
Bromomethane	111		112		57-147	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 09-16 Batch: WG1076365-3 WG1076365-4								
Vinyl chloride	101		102		67-130	1		30
Chloroethane	102		106		50-151	4		30
1,1-Dichloroethene	92		97		65-135	5		30
trans-1,2-Dichloroethene	91		97		70-130	6		30
Trichloroethene	91		97		70-130	6		30
1,2-Dichlorobenzene	91		96		70-130	5		30
1,3-Dichlorobenzene	91		97		70-130	6		30
1,4-Dichlorobenzene	91		97		70-130	6		30
Methyl tert butyl ether	95		100		66-130	5		30
p/m-Xylene	96		101		70-130	5		30
o-Xylene	97		102		70-130	5		30
cis-1,2-Dichloroethene	91		96		70-130	5		30
Dibromomethane	91		94		70-130	3		30
Styrene	91		97		70-130	6		30
Dichlorodifluoromethane	99		102		30-146	3		30
Acetone	134		108		54-140	21		30
Carbon disulfide	94		96		59-130	2		30
2-Butanone	**134**	Q	**134**	Q	70-130	0		30
Vinyl acetate	105		110		70-130	5		30
4-Methyl-2-pentanone	104		104		70-130	0		30
1,2,3-Trichloropropane	91		95		68-130	4		30
2-Hexanone	100		104		70-130	4		30
Bromochloromethane	96		101		70-130	5		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 09-16 Batch: WG1076365-3 WG1076365-4								
2,2-Dichloropropane	104		106		70-130	2		30
1,2-Dibromoethane	93		97		70-130	4		30
1,3-Dichloropropane	95		99		69-130	4		30
1,1,1,2-Tetrachloroethane	96		100		70-130	4		30
Bromobenzene	92		97		70-130	5		30
n-Butylbenzene	92		98		70-130	6		30
sec-Butylbenzene	92		98		70-130	6		30
tert-Butylbenzene	90		97		70-130	7		30
o-Chlorotoluene	92		99		70-130	7		30
p-Chlorotoluene	91		97		70-130	6		30
1,2-Dibromo-3-chloropropane	86		92		68-130	7		30
Hexachlorobutadiene	94		100		67-130	6		30
Isopropylbenzene	92		98		70-130	6		30
p-Isopropyltoluene	92		98		70-130	6		30
Naphthalene	92		98		70-130	6		30
Acrylonitrile	113		121		70-130	7		30
n-Propylbenzene	93		98		70-130	5		30
1,2,3-Trichlorobenzene	97		101		70-130	4		30
1,2,4-Trichlorobenzene	96		103		70-130	7		30
1,3,5-Trimethylbenzene	94		100		70-130	6		30
1,2,4-Trimethylbenzene	100		105		70-130	5		30
1,4-Dioxane	93		94		65-136	1		30
p-Diethylbenzene	92		98		70-130	6		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 09-16 Batch: WG1076365-3 WG1076365-4								
p-Ethyltoluene	100		106		70-130	6		30
1,2,4,5-Tetramethylbenzene	92		97		70-130	5		30
Ethyl ether	94		100		67-130	6		30
trans-1,4-Dichloro-2-butene	108		113		70-130	5		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	105		102		70-130
Toluene-d8	106		104		70-130
4-Bromofluorobenzene	104		104		70-130
Dibromofluoromethane	102		101		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,17 Batch: WG1076365-8 WG1076365-9								
Methylene chloride	77		72		70-130	7		30
1,1-Dichloroethane	110		103		70-130	7		30
Chloroform	96		92		70-130	4		30
Carbon tetrachloride	105		99		70-130	6		30
1,2-Dichloropropane	110		105		70-130	5		30
Dibromochloromethane	99		96		70-130	3		30
1,1,2-Trichloroethane	98		94		70-130	4		30
Tetrachloroethene	105		98		70-130	7		30
Chlorobenzene	99		93		70-130	6		30
Trichlorofluoromethane	101		94		70-139	7		30
1,2-Dichloroethane	105		101		70-130	4		30
1,1,1-Trichloroethane	102		96		70-130	6		30
Bromodichloromethane	95		92		70-130	3		30
trans-1,3-Dichloropropene	106		101		70-130	5		30
cis-1,3-Dichloropropene	102		98		70-130	4		30
1,1-Dichloropropene	103		96		70-130	7		30
Bromoform	101		98		70-130	3		30
1,1,2,2-Tetrachloroethane	93		89		70-130	4		30
Benzene	94		89		70-130	5		30
Toluene	96		89		70-130	8		30
Ethylbenzene	100		94		70-130	6		30
Chloromethane	126		113		52-130	11		30
Bromomethane	117		106		57-147	10		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,17 Batch: WG1076365-8 WG1076365-9								
Vinyl chloride	106		96		67-130	10		30
Chloroethane	108		100		50-151	8		30
1,1-Dichloroethene	98		93		65-135	5		30
trans-1,2-Dichloroethene	98		91		70-130	7		30
Trichloroethene	98		92		70-130	6		30
1,2-Dichlorobenzene	94		92		70-130	2		30
1,3-Dichlorobenzene	97		92		70-130	5		30
1,4-Dichlorobenzene	95		93		70-130	2		30
Methyl tert butyl ether	101		97		66-130	4		30
p/m-Xylene	101		95		70-130	6		30
o-Xylene	103		97		70-130	6		30
cis-1,2-Dichloroethene	97		92		70-130	5		30
Dibromomethane	93		90		70-130	3		30
Styrene	96		92		70-130	4		30
Dichlorodifluoromethane	108		97		30-146	11		30
Acetone	109		100		54-140	9		30
Carbon disulfide	97		90		59-130	7		30
2-Butanone	94		93		70-130	1		30
Vinyl acetate	111		106		70-130	5		30
4-Methyl-2-pentanone	108		101		70-130	7		30
1,2,3-Trichloropropane	95		91		68-130	4		30
2-Hexanone	102		101		70-130	1		30
Bromochloromethane	100		98		70-130	2		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,17 Batch: WG1076365-8 WG1076365-9								
2,2-Dichloropropane	110		102		70-130	8		30
1,2-Dibromoethane	96		92		70-130	4		30
1,3-Dichloropropane	99		95		69-130	4		30
1,1,1,2-Tetrachloroethane	101		97		70-130	4		30
Bromobenzene	98		92		70-130	6		30
n-Butylbenzene	100		94		70-130	6		30
sec-Butylbenzene	99		94		70-130	5		30
tert-Butylbenzene	98		93		70-130	5		30
o-Chlorotoluene	92		97		70-130	5		30
p-Chlorotoluene	96		92		70-130	4		30
1,2-Dibromo-3-chloropropane	93		86		68-130	8		30
Hexachlorobutadiene	104		96		67-130	8		30
Isopropylbenzene	99		93		70-130	6		30
p-Isopropyltoluene	100		94		70-130	6		30
Naphthalene	97		94		70-130	3		30
Acrylonitrile	118		113		70-130	4		30
n-Propylbenzene	99		93		70-130	6		30
1,2,3-Trichlorobenzene	101		98		70-130	3		30
1,2,4-Trichlorobenzene	103		98		70-130	5		30
1,3,5-Trimethylbenzene	100		95		70-130	5		30
1,2,4-Trimethylbenzene	105		98		70-130	7		30
1,4-Dioxane	108		103		65-136	5		30
p-Diethylbenzene	100		93		70-130	7		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,17 Batch: WG1076365-8 WG1076365-9								
p-Ethyltoluene	105		98		70-130	7		30
1,2,4,5-Tetramethylbenzene	98		92		70-130	6		30
Ethyl ether	100		96		67-130	4		30
trans-1,4-Dichloro-2-butene	113		109		70-130	4		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	105		102		70-130
Toluene-d8	106		104		70-130
4-Bromofluorobenzene	104		102		70-130
Dibromofluoromethane	102		101		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 07 Batch: WG1076454-3 WG1076454-4								
Methylene chloride	80		73		70-130	9		30
1,1-Dichloroethane	114		103		70-130	10		30
Chloroform	101		90		70-130	12		30
Carbon tetrachloride	108		98		70-130	10		30
1,2-Dichloropropane	114		106		70-130	7		30
Dibromochloromethane	104		98		70-130	6		30
2-Chloroethylvinyl ether	110		104		70-130	6		30
1,1,2-Trichloroethane	102		96		70-130	6		30
Tetrachloroethene	106		98		70-130	8		30
Chlorobenzene	100		92		70-130	8		30
Trichlorofluoromethane	105		93		70-139	12		30
1,2-Dichloroethane	113		106		70-130	6		30
1,1,1-Trichloroethane	105		97		70-130	8		30
Bromodichloromethane	101		94		70-130	7		30
trans-1,3-Dichloropropene	109		101		70-130	8		30
cis-1,3-Dichloropropene	106		99		70-130	7		30
1,1-Dichloropropene	103		93		70-130	10		30
Bromoform	107		103		70-130	4		30
1,1,2,2-Tetrachloroethane	95		90		70-130	5		30
Benzene	98		89		70-130	10		30
Toluene	94		88		70-130	7		30
Ethylbenzene	99		91		70-130	8		30
Chloromethane	**133**	Q	119		52-130	11		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 07 Batch: WG1076454-3 WG1076454-4								
Bromomethane	118		108		57-147	9		30
Vinyl chloride	107		94		67-130	13		30
Chloroethane	110		97		50-151	13		30
1,1-Dichloroethene	100		90		65-135	11		30
trans-1,2-Dichloroethene	99		90		70-130	10		30
Trichloroethene	102		92		70-130	10		30
1,2-Dichlorobenzene	98		92		70-130	6		30
1,3-Dichlorobenzene	98		92		70-130	6		30
1,4-Dichlorobenzene	97		93		70-130	4		30
Methyl tert butyl ether	104		98		66-130	6		30
p/m-Xylene	101		93		70-130	8		30
o-Xylene	104		96		70-130	8		30
cis-1,2-Dichloroethene	100		91		70-130	9		30
Dibromomethane	100		95		70-130	5		30
Styrene	98		92		70-130	6		30
Dichlorodifluoromethane	107		95		30-146	12		30
Acetone	125		99		54-140	23		30
Carbon disulfide	98		89		59-130	10		30
2-Butanone	115		101		70-130	13		30
Vinyl acetate	120		114		70-130	5		30
4-Methyl-2-pentanone	113		109		70-130	4		30
1,2,3-Trichloropropane	96		89		68-130	8		30
2-Hexanone	113		107		70-130	5		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 07 Batch: WG1076454-3 WG1076454-4								
Bromochloromethane	106		101		70-130	5		30
2,2-Dichloropropane	112		102		70-130	9		30
1,2-Dibromoethane	100		95		70-130	5		30
1,3-Dichloropropane	101		96		69-130	5		30
1,1,1,2-Tetrachloroethane	105		98		70-130	7		30
Bromobenzene	98		94		70-130	4		30
n-Butylbenzene	98		91		70-130	7		30
sec-Butylbenzene	98		90		70-130	9		30
tert-Butylbenzene	96		89		70-130	8		30
o-Chlorotoluene	102		96		70-130	6		30
p-Chlorotoluene	96		89		70-130	8		30
1,2-Dibromo-3-chloropropane	94		92		68-130	2		30
Hexachlorobutadiene	106		96		67-130	10		30
Isopropylbenzene	98		90		70-130	9		30
p-Isopropyltoluene	98		91		70-130	7		30
Naphthalene	101		95		70-130	6		30
Acrylonitrile	**135**	Q	127		70-130	6		30
Isopropyl Ether	127		120		66-130	6		30
tert-Butyl Alcohol	129		126		70-130	2		30
n-Propylbenzene	96		90		70-130	6		30
1,2,3-Trichlorobenzene	106		98		70-130	8		30
1,2,4-Trichlorobenzene	105		98		70-130	7		30
1,3,5-Trimethylbenzene	99		91		70-130	8		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 07 Batch: WG1076454-3 WG1076454-4								
1,2,4-Trimethylbenzene	101		94		70-130	7		30
Methyl Acetate	126		117		51-146	7		30
Ethyl Acetate	125		119		70-130	5		30
Acrolein	103		113		70-130	9		30
Cyclohexane	129		118		59-142	9		30
1,4-Dioxane	109		108		65-136	1		30
1,1,2-Trichloro-1,2,2-Trifluoroethane	105		94		50-139	11		30
1,4-Diethylbenzene	98		91		70-130	7		30
4-Ethyltoluene	100		93		70-130	7		30
1,2,4,5-Tetramethylbenzene	97		90		70-130	7		30
Tetrahydrofuran	128		129		66-130	1		30
Ethyl ether	103		96		67-130	7		30
trans-1,4-Dichloro-2-butene	122		114		70-130	7		30
Methyl cyclohexane	103		93		70-130	10		30
Ethyl-Tert-Butyl-Ether	120		114		70-130	5		30
Tertiary-Amyl Methyl Ether	103		97		70-130	6		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	107		106		70-130
Toluene-d8	102		102		70-130
4-Bromofluorobenzene	100		100		70-130
Dibromofluoromethane	103		104		70-130

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1746315

Project Number: BBU1702 ***Report Date:*** 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,09-17 QC Batch ID: WG1076365-11 WG1076365-12 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
Methylene chloride	ND	105	61	**58**	Q	56	**54**	Q	70-130	9		30
1,1-Dichloroethane	ND	105	92	88		86	83		70-130	7		30
Chloroform	ND	105	70	**67**	Q	60	**58**	Q	70-130	16		30
Carbon tetrachloride	ND	105	93	88		87	84		70-130	6		30
1,2-Dichloropropane	ND	105	73	**69**	Q	68	**65**	Q	70-130	7		30
Dibromochloromethane	ND	105	46	**44**	Q	41	**40**	Q	70-130	11		30
1,1,2-Trichloroethane	ND	105	51	**49**	Q	48	**47**	Q	70-130	6		30
Tetrachloroethene	ND	105	42	**40**	Q	36	**35**	Q	70-130	14		30
Chlorobenzene	ND	105	23	**22**	Q	19	**18**	Q	70-130	23		30
Trichlorofluoromethane	ND	105	110	106		99	96		70-139	12		30
1,2-Dichloroethane	ND	105	60	**57**	Q	52	**50**	Q	70-130	14		30
1,1,1-Trichloroethane	ND	105	93	89		88	86		70-130	6		30
Bromodichloromethane	ND	105	56	**53**	Q	49	**48**	Q	70-130	12		30
trans-1,3-Dichloropropene	ND	105	26	**24**	Q	18	**17**	Q	70-130	**37**	Q	30
cis-1,3-Dichloropropene	ND	105	34	**32**	Q	24	**23**	Q	70-130	**35**	Q	30
1,1-Dichloropropene	ND	105	70	**66**	Q	56	**54**	Q	70-130	22		30
Bromoform	ND	105	43	**41**	Q	39	**38**	Q	70-130	9		30
1,1,2,2-Tetrachloroethane	ND	105	36	**34**	Q	17	**16**	Q	70-130	**72**	Q	30
Benzene	ND	105	62	**59**	Q	54	**52**	Q	70-130	15		30
Toluene	ND	105	40	**38**	Q	33	**32**	Q	70-130	18		30
Ethylbenzene	ND	105	26	**25**	Q	23	**22**	Q	70-130	15		30
Chloromethane	ND	105	130	124		130	128		52-130	2		30
Bromomethane	ND	105	92	88		79	76		57-147	16		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,09-17 QC Batch ID: WG1076365-11 WG1076365-12 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
Vinyl chloride	ND	105	110	104		110	106		67-130	0		30
Chloroethane	ND	105	95	91		58	56		50-151	**48**	Q	30
1,1-Dichloroethene	ND	105	92	88		82	80		65-135	11		30
trans-1,2-Dichloroethene	ND	105	62	**58**	Q	45	**44**	Q	70-130	**31**	Q	30
Trichloroethene	ND	105	58	**55**	Q	54	**53**	Q	70-130	6		30
1,2-Dichlorobenzene	ND	105	12	**12**	Q	12	**12**	Q	70-130	3		30
1,3-Dichlorobenzene	ND	105	11	**10**	Q	10	**10**	Q	70-130	6		30
1,4-Dichlorobenzene	ND	105	9.8	**9**	Q	9.1	**9**	Q	70-130	8		30
Methyl tert butyl ether	ND	105	95	90		92	89		66-130	3		30
p/m-Xylene	ND	210	47	**22**	Q	42	**20**	Q	70-130	11		30
o-Xylene	ND	210	53	**25**	Q	51	**25**	Q	70-130	3		30
cis-1,2-Dichloroethene	ND	105	54	**51**	Q	42	**40**	Q	70-130	26		30
Dibromomethane	ND	105	41	**39**	Q	34	**33**	Q	70-130	20		30
Styrene	ND	210	32	**15**	Q	25	**12**	Q	70-130	26		30
Dichlorodifluoromethane	ND	105	120	113		120	116		30-146	1		30
Acetone	44	105	140	92		160	114		54-140	14		30
Carbon disulfide	2.0J	105	70	67		55	**53**	Q	59-130	25		30
2-Butanone	ND	105	110	101		110	105		70-130	2		30
Vinyl acetate	ND	105	18	**17**	Q	16	**16**	Q	70-130	10		30
4-Methyl-2-pentanone	ND	105	87	82		87	84		70-130	0		30
1,2,3-Trichloropropane	ND	105	46	**44**	Q	40	**39**	Q	68-130	13		30
2-Hexanone	ND	105	66	**62**	Q	60	**58**	Q	70-130	8		30
Bromochloromethane	ND	105	56	**53**	Q	48	**47**	Q	70-130	15		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1746315

Project Number: BBU1702 ***Report Date:*** 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,09-17 QC Batch ID: WG1076365-11 WG1076365-12 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
2,2-Dichloropropane	ND	105	100	97		98	95		70-130	4		30
1,2-Dibromoethane	ND	105	32	**30**	Q	25	**24**	Q	70-130	24		30
1,3-Dichloropropane	ND	105	42	**40**	Q	36	**35**	Q	69-130	14		30
1,1,1,2-Tetrachloroethane	ND	105	50	**48**	Q	50	**48**	Q	70-130	1		30
Bromobenzene	ND	105	17	**16**	Q	15	**14**	Q	70-130	14		30
n-Butylbenzene	ND	105	7.1	**7**	Q	9.0	**9**	Q	70-130	23		30
sec-Butylbenzene	ND	105	15	**14**	Q	19	**18**	Q	70-130	25		30
tert-Butylbenzene	ND	105	21	**20**	Q	27	**26**	Q	70-130	26		30
o-Chlorotoluene	ND	105	18	**17**	Q	15	**14**	Q	70-130	17		30
p-Chlorotoluene	ND	105	12	**11**	Q	11	**11**	Q	70-130	6		30
1,2-Dibromo-3-chloropropane	ND	105	36	**35**	Q	32	**31**	Q	68-130	14		30
Hexachlorobutadiene	ND	105	7.8	**7**	Q	14	**14**	Q	67-130	**59**	Q	30
Isopropylbenzene	ND	105	24	**22**	Q	26	**25**	Q	70-130	9		30
p-Isopropyltoluene	ND	105	11	**10**	Q	15	**14**	Q	70-130	30		30
Naphthalene	ND	105	11	**10**	Q	7.9	**8**	Q	70-130	28		30
Acrylonitrile	ND	105	92	87		93	90		70-130	1		30
n-Propylbenzene	ND	105	14	**14**	Q	15	**15**	Q	70-130	5		30
1,2,3-Trichlorobenzene	ND	105	8.3	**8**	Q	8.3	**8**	Q	70-130	0		30
1,2,4-Trichlorobenzene	ND	105	6.8	**7**	Q	6.4	**6**	Q	70-130	6		30
1,3,5-Trimethylbenzene	0.26J	105	17	**16**	Q	21	**20**	Q	70-130	19		30
1,2,4-Trimethylbenzene	0.61J	105	14	**14**	Q	17	**16**	Q	70-130	15		30
1,4-Dioxane	ND	5250	6000	113		6400	124		65-136	7		30
p-Diethylbenzene	ND	105	7.5	**7**	Q	9.6	**9**	Q	70-130	25		30

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1746315

Project Number: BBU1702 ***Report Date:*** 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by 8260/5035 - Westborough Lab Associated sample(s): 03,09-17 QC Batch ID: WG1076365-11 WG1076365-12 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
p-Ethyltoluene	0.63J	105	13	**13**	Q	15	**14**	Q	70-130	9		30
1,2,4,5-Tetramethylbenzene	ND	105	9.6	**9**	Q	13	**12**	Q	70-130	29		30
Ethyl ether	ND	105	79	75		77	75		67-130	3		30
trans-1,4-Dichloro-2-butene	ND	105	19	**18**	Q	13	**12**	Q	70-130	**40**	Q	30

Surrogate	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	110		108		70-130
4-Bromofluorobenzene	105		110		70-130
Dibromofluoromethane	106		105		70-130
Toluene-d8	104		106		70-130

SEMIVOLATILES

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01
Client ID: SB005 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 12:57
Analyst: KR
Percent Solids: 88%

Date Collected: 12/14/17 09:30
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	160		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	180	18.	1
1,2-Dichlorobenzene	ND		ug/kg	180	33.	1
1,3-Dichlorobenzene	ND		ug/kg	180	32.	1
1,4-Dichlorobenzene	ND		ug/kg	180	32.	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	49.	1
2,4-Dinitrotoluene	ND		ug/kg	180	37.	1
2,6-Dinitrotoluene	ND		ug/kg	180	32.	1
Fluoranthene	3100		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	180	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	180	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	530	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	110	J	ug/kg	180	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	180	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	64.	1
Butyl benzyl phthalate	ND		ug/kg	180	47.	1
Di-n-butylphthalate	75	J	ug/kg	180	35.	1
Di-n-octylphthalate	ND		ug/kg	180	63.	1
Diethyl phthalate	ND		ug/kg	180	17.	1
Dimethyl phthalate	ND		ug/kg	180	39.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01 Date Collected: 12/14/17 09:30

Client ID: SB005 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	1500		ug/kg	110	21.	1
Benzo(a)pyrene	1400		ug/kg	150	45.	1
Benzo(b)fluoranthene	1800		ug/kg	110	31.	1
Benzo(k)fluoranthene	600		ug/kg	110	30.	1
Chrysene	1700		ug/kg	110	19.	1
Acenaphthylene	77	J	ug/kg	150	29.	1
Anthracene	420		ug/kg	110	36.	1
Benzo(ghi)perylene	830		ug/kg	150	22.	1
Fluorene	150	J	ug/kg	180	18.	1
Phenanthrene	2200		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	230		ug/kg	110	21.	1
Indeno(1,2,3-cd)pyrene	880		ug/kg	150	26.	1
Pyrene	2900		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	420	43.	1
4-Chloroaniline	ND		ug/kg	180	34.	1
2-Nitroaniline	ND		ug/kg	180	36.	1
3-Nitroaniline	ND		ug/kg	180	35.	1
4-Nitroaniline	ND		ug/kg	180	77.	1
Dibenzofuran	69	J	ug/kg	180	18.	1
2-Methylnaphthalene	89	J	ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	180	19.	1
Acetophenone	ND		ug/kg	180	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	180	28.	1
2-Chlorophenol	ND		ug/kg	180	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	180	61.	1
2-Nitrophenol	ND		ug/kg	400	70.	1
4-Nitrophenol	ND		ug/kg	260	76.	1
2,4-Dinitrophenol	ND		ug/kg	890	87.	1
4,6-Dinitro-o-cresol	ND		ug/kg	480	89.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	180	28.	1
2-Methylphenol	ND		ug/kg	180	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	180	36.	1
Benzoic Acid	ND		ug/kg	600	190	1
Benzyl Alcohol	ND		ug/kg	180	57.	1
Carbazole	160	J	ug/kg	180	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01 Date Collected: 12/14/17 09:30

Client ID: SB005 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	75		25-120
Phenol-d6	76		10-120
Nitrobenzene-d5	96		23-120
2-Fluorobiphenyl	85		30-120
2,4,6-Tribromophenol	90		10-136
4-Terphenyl-d14	60		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02
Client ID: SB005 (3-5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 13:23
Analyst: KR
Percent Solids: 84%

Date Collected: 12/14/17 09:35
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	160	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	23.	1
Hexachlorobenzene	ND		ug/kg	120	22.	1
Bis(2-chloroethyl)ether	ND		ug/kg	180	27.	1
2-Chloronaphthalene	ND		ug/kg	200	20.	1
1,2-Dichlorobenzene	ND		ug/kg	200	36.	1
1,3-Dichlorobenzene	ND		ug/kg	200	34.	1
1,4-Dichlorobenzene	ND		ug/kg	200	35.	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	53.	1
2,4-Dinitrotoluene	ND		ug/kg	200	40.	1
2,6-Dinitrotoluene	ND		ug/kg	200	34.	1
Fluoranthene	110	J	ug/kg	120	23.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	200	21.	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	30.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	240	34.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	20.	1
Hexachlorobutadiene	ND		ug/kg	200	29.	1
Hexachlorocyclopentadiene	ND		ug/kg	570	180	1
Hexachloroethane	ND		ug/kg	160	32.	1
Isophorone	ND		ug/kg	180	26.	1
Naphthalene	ND		ug/kg	200	24.	1
Nitrobenzene	ND		ug/kg	180	29.	1
NDPA/DPA	ND		ug/kg	160	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	200	31.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	200	69.	1
Butyl benzyl phthalate	ND		ug/kg	200	50.	1
Di-n-butylphthalate	ND		ug/kg	200	38.	1
Di-n-octylphthalate	ND		ug/kg	200	67.	1
Diethyl phthalate	ND		ug/kg	200	18.	1
Dimethyl phthalate	ND		ug/kg	200	42.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02 Date Collected: 12/14/17 09:35

Client ID: SB005 (3-5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	58	J	ug/kg	120	22.	1
Benzo(a)pyrene	53	J	ug/kg	160	48.	1
Benzo(b)fluoranthene	63	J	ug/kg	120	33.	1
Benzo(k)fluoranthene	ND		ug/kg	120	32.	1
Chrysene	58	J	ug/kg	120	21.	1
Acenaphthylene	ND		ug/kg	160	31.	1
Anthracene	ND		ug/kg	120	39.	1
Benzo(ghi)perylene	35	J	ug/kg	160	23.	1
Fluorene	ND		ug/kg	200	19.	1
Phenanthrene	69	J	ug/kg	120	24.	1
Dibenzo(a,h)anthracene	ND		ug/kg	120	23.	1
Indeno(1,2,3-cd)pyrene	39	J	ug/kg	160	28.	1
Pyrene	88	J	ug/kg	120	20.	1
Biphenyl	ND		ug/kg	450	46.	1
4-Chloroaniline	ND		ug/kg	200	36.	1
2-Nitroaniline	ND		ug/kg	200	38.	1
3-Nitroaniline	ND		ug/kg	200	37.	1
4-Nitroaniline	ND		ug/kg	200	82.	1
Dibenzofuran	ND		ug/kg	200	19.	1
2-Methylnaphthalene	ND		ug/kg	240	24.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	200	21.	1
Acetophenone	ND		ug/kg	200	24.	1
2,4,6-Trichlorophenol	ND		ug/kg	120	38.	1
p-Chloro-m-cresol	ND		ug/kg	200	30.	1
2-Chlorophenol	ND		ug/kg	200	23.	1
2,4-Dichlorophenol	ND		ug/kg	180	32.	1
2,4-Dimethylphenol	ND		ug/kg	200	65.	1
2-Nitrophenol	ND		ug/kg	430	74.	1
4-Nitrophenol	ND		ug/kg	280	81.	1
2,4-Dinitrophenol	ND		ug/kg	950	92.	1
4,6-Dinitro-o-cresol	ND		ug/kg	520	95.	1
Pentachlorophenol	ND		ug/kg	160	44.	1
Phenol	ND		ug/kg	200	30.	1
2-Methylphenol	ND		ug/kg	200	31.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	280	31.	1
2,4,5-Trichlorophenol	ND		ug/kg	200	38.	1
Benzoic Acid	ND		ug/kg	640	200	1
Benzyl Alcohol	ND		ug/kg	200	61.	1
Carbazole	ND		ug/kg	200	19.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02 Date Collected: 12/14/17 09:35

Client ID: SB005 (3-5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	87		25-120
Phenol-d6	87		10-120
Nitrobenzene-d5	92		23-120
2-Fluorobiphenyl	78		30-120
2,4,6-Tribromophenol	110		10-136
4-Terphenyl-d14	55		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03
Client ID: SB006 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 13:48
Analyst: KR
Percent Solids: 87%

Date Collected: 12/14/17 09:45
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	62	J	ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	33.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	51.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	33.	1
Fluoranthene	1600		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	210	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	31.	1
Isophorone	ND		ug/kg	170	25.	1
Naphthalene	83	J	ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	66.	1
Butyl benzyl phthalate	ND		ug/kg	190	48.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	65.	1
Diethyl phthalate	ND		ug/kg	190	18.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03 Date Collected: 12/14/17 09:45

Client ID: SB006 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	850		ug/kg	110	21.	1
Benzo(a)pyrene	800		ug/kg	150	46.	1
Benzo(b)fluoranthene	1000		ug/kg	110	32.	1
Benzo(k)fluoranthene	370		ug/kg	110	30.	1
Chrysene	890		ug/kg	110	20.	1
Acenaphthylene	78	J	ug/kg	150	29.	1
Anthracene	180		ug/kg	110	37.	1
Benzo(ghi)perylene	500		ug/kg	150	22.	1
Fluorene	71	J	ug/kg	190	18.	1
Phenanthrene	850		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	140		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	540		ug/kg	150	27.	1
Pyrene	1400		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	440	44.	1
4-Chloroaniline	ND		ug/kg	190	35.	1
2-Nitroaniline	ND		ug/kg	190	37.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	ND		ug/kg	190	79.	1
Dibenzofuran	36	J	ug/kg	190	18.	1
2-Methylnaphthalene	84	J	ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	24.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	31.	1
2,4-Dimethylphenol	ND		ug/kg	190	63.	1
2-Nitrophenol	ND		ug/kg	410	72.	1
4-Nitrophenol	ND		ug/kg	270	78.	1
2,4-Dinitrophenol	ND		ug/kg	920	89.	1
4,6-Dinitro-o-cresol	ND		ug/kg	500	92.	1
Pentachlorophenol	ND		ug/kg	150	42.	1
Phenol	ND		ug/kg	190	29.	1
2-Methylphenol	ND		ug/kg	190	30.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	620	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	91	J	ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03 Date Collected: 12/14/17 09:45

Client ID: SB006 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	64		25-120
Phenol-d6	78		10-120
Nitrobenzene-d5	91		23-120
2-Fluorobiphenyl	77		30-120
2,4,6-Tribromophenol	59		10-136
4-Terphenyl-d14	54		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04
Client ID: SB006 (7.5-9.5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/22/17 10:44
Analyst: CB
Percent Solids: 88%

Date Collected: 12/14/17 09:50
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	190	18.	1
1,2-Dichlorobenzene	ND		ug/kg	190	33.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	32.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	37.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	ND		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	530	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	64.	1
Butyl benzyl phthalate	ND		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	35.	1
Di-n-octylphthalate	ND		ug/kg	190	63.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	39.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04 Date Collected: 12/14/17 09:50

Client ID: SB006 (7.5-9.5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	21.	1
Benzo(a)pyrene	ND		ug/kg	150	45.	1
Benzo(b)fluoranthene	ND		ug/kg	110	31.	1
Benzo(k)fluoranthene	ND		ug/kg	110	30.	1
Chrysene	ND		ug/kg	110	19.	1
Acenaphthylene	ND		ug/kg	150	29.	1
Anthracene	ND		ug/kg	110	36.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	ND		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	26.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	420	43.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	35.	1
4-Nitroaniline	ND		ug/kg	190	77.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	19.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	61.	1
2-Nitrophenol	ND		ug/kg	400	70.	1
4-Nitrophenol	ND		ug/kg	260	76.	1
2,4-Dinitrophenol	ND		ug/kg	890	87.	1
4,6-Dinitro-o-cresol	ND		ug/kg	480	89.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	600	190	1
Benzyl Alcohol	ND		ug/kg	190	57.	1
Carbazole	ND		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04 Date Collected: 12/14/17 09:50

Client ID: SB006 (7.5-9.5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	96		25-120
Phenol-d6	101		10-120
Nitrobenzene-d5	96		23-120
2-Fluorobiphenyl	80		30-120
2,4,6-Tribromophenol	79		10-136
4-Terphenyl-d14	61		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05
Client ID: SB007 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 14:14
Analyst: KR
Percent Solids: 86%

Date Collected: 12/14/17 10:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	100	J	ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	2900		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	31.	1
Isophorone	ND		ug/kg	170	25.	1
Naphthalene	200		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	66.	1
Butyl benzyl phthalate	ND		ug/kg	190	48.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	18.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05 Date Collected: 12/14/17 10:00

Client ID: SB007 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	1400		ug/kg	110	21.	1
Benzo(a)pyrene	1400		ug/kg	150	46.	1
Benzo(b)fluoranthene	1700		ug/kg	110	32.	1
Benzo(k)fluoranthene	640		ug/kg	110	30.	1
Chrysene	1500		ug/kg	110	20.	1
Acenaphthylene	290		ug/kg	150	29.	1
Anthracene	400		ug/kg	110	37.	1
Benzo(ghi)perylene	810		ug/kg	150	22.	1
Fluorene	240		ug/kg	190	18.	1
Phenanthrene	2200		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	220		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	900		ug/kg	150	26.	1
Pyrene	2500		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	89	J	ug/kg	190	78.	1
Dibenzofuran	130	J	ug/kg	190	18.	1
2-Methylnaphthalene	120	J	ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	410	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	910	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	91.	1
Pentachlorophenol	ND		ug/kg	150	42.	1
Phenol	ND		ug/kg	190	29.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	230		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05 Date Collected: 12/14/17 10:00

Client ID: SB007 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	93		25-120
Phenol-d6	91		10-120
Nitrobenzene-d5	106		23-120
2-Fluorobiphenyl	82		30-120
2,4,6-Tribromophenol	106		10-136
4-Terphenyl-d14	59		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06
Client ID: SB007 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/22/17 11:10
Analyst: CB
Percent Solids: 89%

Date Collected: 12/14/17 10:05
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	21.	1
Hexachlorobenzene	ND		ug/kg	110	20.	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	25.	1
2-Chloronaphthalene	ND		ug/kg	180	18.	1
1,2-Dichlorobenzene	ND		ug/kg	180	33.	1
1,3-Dichlorobenzene	ND		ug/kg	180	31.	1
1,4-Dichlorobenzene	ND		ug/kg	180	32.	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	49.	1
2,4-Dinitrotoluene	ND		ug/kg	180	37.	1
2,6-Dinitrotoluene	ND		ug/kg	180	31.	1
Fluoranthene	ND		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	180	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	31.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	18.	1
Hexachlorobutadiene	ND		ug/kg	180	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	520	160	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	160	24.	1
Naphthalene	ND		ug/kg	180	22.	1
Nitrobenzene	ND		ug/kg	160	27.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	180	28.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	63.	1
Butyl benzyl phthalate	ND		ug/kg	180	46.	1
Di-n-butylphthalate	ND		ug/kg	180	35.	1
Di-n-octylphthalate	ND		ug/kg	180	62.	1
Diethyl phthalate	ND		ug/kg	180	17.	1
Dimethyl phthalate	ND		ug/kg	180	38.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06 Date Collected: 12/14/17 10:05

Client ID: SB007 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	21.	1
Benzo(a)pyrene	ND		ug/kg	150	45.	1
Benzo(b)fluoranthene	ND		ug/kg	110	31.	1
Benzo(k)fluoranthene	ND		ug/kg	110	29.	1
Chrysene	ND		ug/kg	110	19.	1
Acenaphthylene	ND		ug/kg	150	28.	1
Anthracene	ND		ug/kg	110	36.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	180	18.	1
Phenanthrene	ND		ug/kg	110	22.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	21.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	26.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	420	42.	1
4-Chloroaniline	ND		ug/kg	180	33.	1
2-Nitroaniline	ND		ug/kg	180	35.	1
3-Nitroaniline	ND		ug/kg	180	34.	1
4-Nitroaniline	ND		ug/kg	180	76.	1
Dibenzofuran	ND		ug/kg	180	17.	1
2-Methylnaphthalene	ND		ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	180	19.	1
Acetophenone	ND		ug/kg	180	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	180	27.	1
2-Chlorophenol	ND		ug/kg	180	22.	1
2,4-Dichlorophenol	ND		ug/kg	160	29.	1
2,4-Dimethylphenol	ND		ug/kg	180	60.	1
2-Nitrophenol	ND		ug/kg	400	69.	1
4-Nitrophenol	ND		ug/kg	260	75.	1
2,4-Dinitrophenol	ND		ug/kg	880	85.	1
4,6-Dinitro-o-cresol	ND		ug/kg	480	88.	1
Pentachlorophenol	ND		ug/kg	150	40.	1
Phenol	ND		ug/kg	180	28.	1
2-Methylphenol	ND		ug/kg	180	28.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	180	35.	1
Benzoic Acid	ND		ug/kg	590	180	1
Benzyl Alcohol	ND		ug/kg	180	56.	1
Carbazole	ND		ug/kg	180	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06 Date Collected: 12/14/17 10:05

Client ID: SB007 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	85		25-120
Phenol-d6	90		10-120
Nitrobenzene-d5	86		23-120
2-Fluorobiphenyl	72		30-120
2,4,6-Tribromophenol	71		10-136
4-Terphenyl-d14	52		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07
Client ID: SB008 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 14:39
Analyst: KR
Percent Solids: 91%

Date Collected: 12/14/17 10:25
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	21.	1
Hexachlorobenzene	ND		ug/kg	110	20.	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	25.	1
2-Chloronaphthalene	ND		ug/kg	180	18.	1
1,2-Dichlorobenzene	ND		ug/kg	180	33.	1
1,3-Dichlorobenzene	ND		ug/kg	180	31.	1
1,4-Dichlorobenzene	ND		ug/kg	180	32.	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	48.	1
2,4-Dinitrotoluene	ND		ug/kg	180	36.	1
2,6-Dinitrotoluene	ND		ug/kg	180	31.	1
Fluoranthene	510		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	180	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	31.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	18.	1
Hexachlorobutadiene	ND		ug/kg	180	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	520	160	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	160	24.	1
Naphthalene	82	J	ug/kg	180	22.	1
Nitrobenzene	ND		ug/kg	160	27.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	180	28.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	63.	1
Butyl benzyl phthalate	ND		ug/kg	180	46.	1
Di-n-butylphthalate	ND		ug/kg	180	35.	1
Di-n-octylphthalate	ND		ug/kg	180	62.	1
Diethyl phthalate	ND		ug/kg	180	17.	1
Dimethyl phthalate	ND		ug/kg	180	38.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07 Date Collected: 12/14/17 10:25

Client ID: SB008 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	320		ug/kg	110	20.	1
Benzo(a)pyrene	360		ug/kg	150	44.	1
Benzo(b)fluoranthene	500		ug/kg	110	31.	1
Benzo(k)fluoranthene	160		ug/kg	110	29.	1
Chrysene	360		ug/kg	110	19.	1
Acenaphthylene	95	J	ug/kg	150	28.	1
Anthracene	66	J	ug/kg	110	36.	1
Benzo(ghi)perylene	260		ug/kg	150	21.	1
Fluorene	ND		ug/kg	180	18.	1
Phenanthrene	180		ug/kg	110	22.	1
Dibenzo(a,h)anthracene	70	J	ug/kg	110	21.	1
Indeno(1,2,3-cd)pyrene	280		ug/kg	150	25.	1
Pyrene	480		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	420	42.	1
4-Chloroaniline	ND		ug/kg	180	33.	1
2-Nitroaniline	ND		ug/kg	180	35.	1
3-Nitroaniline	ND		ug/kg	180	34.	1
4-Nitroaniline	ND		ug/kg	180	76.	1
Dibenzofuran	25	J	ug/kg	180	17.	1
2-Methylnaphthalene	74	J	ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	180	19.	1
Acetophenone	ND		ug/kg	180	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	180	27.	1
2-Chlorophenol	ND		ug/kg	180	22.	1
2,4-Dichlorophenol	ND		ug/kg	160	29.	1
2,4-Dimethylphenol	ND		ug/kg	180	60.	1
2-Nitrophenol	ND		ug/kg	390	69.	1
4-Nitrophenol	ND		ug/kg	260	74.	1
2,4-Dinitrophenol	ND		ug/kg	880	85.	1
4,6-Dinitro-o-cresol	ND		ug/kg	470	88.	1
Pentachlorophenol	ND		ug/kg	150	40.	1
Phenol	ND		ug/kg	180	28.	1
2-Methylphenol	ND		ug/kg	180	28.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	180	35.	1
Benzoic Acid	ND		ug/kg	590	180	1
Benzyl Alcohol	ND		ug/kg	180	56.	1
Carbazole	27	J	ug/kg	180	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07 Date Collected: 12/14/17 10:25

Client ID: SB008 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	66		25-120
Phenol-d6	68		10-120
Nitrobenzene-d5	98		23-120
2-Fluorobiphenyl	76		30-120
2,4,6-Tribromophenol	86		10-136
4-Terphenyl-d14	54		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08
Client ID: SB008 (10-12)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/22/17 10:18
Analyst: CB
Percent Solids: 89%

Date Collected: 12/14/17 10:30
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	ND		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	65.	1
Butyl benzyl phthalate	ND		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	39.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08 Date Collected: 12/14/17 10:30

Client ID: SB008 (10-12) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	21.	1
Benzo(a)pyrene	ND		ug/kg	150	46.	1
Benzo(b)fluoranthene	ND		ug/kg	110	32.	1
Benzo(k)fluoranthene	ND		ug/kg	110	30.	1
Chrysene	ND		ug/kg	110	20.	1
Acenaphthylene	ND		ug/kg	150	29.	1
Anthracene	ND		ug/kg	110	36.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	ND		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	26.	1
Pyrene	ND		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	35.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	220	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	400	70.	1
4-Nitrophenol	ND		ug/kg	260	76.	1
2,4-Dinitrophenol	ND		ug/kg	900	87.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	90.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	57.	1
Carbazole	ND		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08 Date Collected: 12/14/17 10:30

Client ID: SB008 (10-12) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	69		25-120
Phenol-d6	76		10-120
Nitrobenzene-d5	73		23-120
2-Fluorobiphenyl	69		30-120
2,4,6-Tribromophenol	79		10-136
4-Terphenyl-d14	68		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09
Client ID: SB009 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 15:05
Analyst: KR
Percent Solids: 86%

Date Collected: 12/14/17 10:50
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	630		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	150	J	ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	77	J	ug/kg	190	65.	1
Butyl benzyl phthalate	ND		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09 Date Collected: 12/14/17 10:50

Client ID: SB009 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	420		ug/kg	110	21.	1
Benzo(a)pyrene	340		ug/kg	150	46.	1
Benzo(b)fluoranthene	520		ug/kg	110	32.	1
Benzo(k)fluoranthene	160		ug/kg	110	30.	1
Chrysene	580		ug/kg	110	20.	1
Acenaphthylene	74	J	ug/kg	150	29.	1
Anthracene	82	J	ug/kg	110	37.	1
Benzo(ghi)perylene	210		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	360		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	75	J	ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	230		ug/kg	150	26.	1
Pyrene	580		ug/kg	110	19.	1
Biphenyl	46	J	ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	40	J	ug/kg	190	18.	1
2-Methylnaphthalene	270		ug/kg	220	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	91	J	ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	410	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	900	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	90.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	23	J	ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09 Date Collected: 12/14/17 10:50

Client ID: SB009 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	55		25-120
Phenol-d6	70		10-120
Nitrobenzene-d5	91		23-120
2-Fluorobiphenyl	87		30-120
2,4,6-Tribromophenol	51		10-136
4-Terphenyl-d14	68		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10
Client ID: SB009 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/22/17 15:32
Analyst: CB
Percent Solids: 88%

Date Collected: 12/14/17 10:55
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	ND		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	65.	1
Butyl benzyl phthalate	ND		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	39.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10 Date Collected: 12/14/17 10:55

Client ID: SB009 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	21.	1
Benzo(a)pyrene	ND		ug/kg	150	46.	1
Benzo(b)fluoranthene	ND		ug/kg	110	32.	1
Benzo(k)fluoranthene	ND		ug/kg	110	30.	1
Chrysene	ND		ug/kg	110	20.	1
Acenaphthylene	ND		ug/kg	150	29.	1
Anthracene	ND		ug/kg	110	36.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	ND		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	26.	1
Pyrene	ND		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	35.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	220	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	400	70.	1
4-Nitrophenol	ND		ug/kg	260	76.	1
2,4-Dinitrophenol	ND		ug/kg	900	87.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	90.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	57.	1
Carbazole	ND		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10 Date Collected: 12/14/17 10:55

Client ID: SB009 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	88		25-120
Phenol-d6	92		10-120
Nitrobenzene-d5	89		23-120
2-Fluorobiphenyl	75		30-120
2,4,6-Tribromophenol	79		10-136
4-Terphenyl-d14	61		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11
Client ID: SB010 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 15:30
Analyst: KR
Percent Solids: 80%

Date Collected: 12/14/17 11:05
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	25	J	ug/kg	160	21.	1
1,2,4-Trichlorobenzene	ND		ug/kg	210	24.	1
Hexachlorobenzene	ND		ug/kg	120	23.	1
Bis(2-chloroethyl)ether	ND		ug/kg	190	28.	1
2-Chloronaphthalene	ND		ug/kg	210	20.	1
1,2-Dichlorobenzene	ND		ug/kg	210	37.	1
1,3-Dichlorobenzene	ND		ug/kg	210	36.	1
1,4-Dichlorobenzene	ND		ug/kg	210	36.	1
3,3'-Dichlorobenzidine	ND		ug/kg	210	55.	1
2,4-Dinitrotoluene	ND		ug/kg	210	41.	1
2,6-Dinitrotoluene	ND		ug/kg	210	36.	1
Fluoranthene	2100		ug/kg	120	24.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	210	22.	1
4-Bromophenyl phenyl ether	ND		ug/kg	210	32.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	250	35.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	220	21.	1
Hexachlorobutadiene	ND		ug/kg	210	30.	1
Hexachlorocyclopentadiene	ND		ug/kg	590	190	1
Hexachloroethane	ND		ug/kg	160	34.	1
Isophorone	ND		ug/kg	190	27.	1
Naphthalene	52	J	ug/kg	210	25.	1
Nitrobenzene	ND		ug/kg	190	31.	1
NDPA/DPA	ND		ug/kg	160	24.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	210	32.	1
Bis(2-ethylhexyl)phthalate	2000		ug/kg	210	72.	1
Butyl benzyl phthalate	590		ug/kg	210	52.	1
Di-n-butylphthalate	75	J	ug/kg	210	39.	1
Di-n-octylphthalate	ND		ug/kg	210	70.	1
Diethyl phthalate	ND		ug/kg	210	19.	1
Dimethyl phthalate	870		ug/kg	210	44.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11 Date Collected: 12/14/17 11:05

Client ID: SB010 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	1400		ug/kg	120	23.	1
Benzo(a)pyrene	1400		ug/kg	160	50.	1
Benzo(b)fluoranthene	1800		ug/kg	120	35.	1
Benzo(k)fluoranthene	690		ug/kg	120	33.	1
Chrysene	1500		ug/kg	120	22.	1
Acenaphthylene	400		ug/kg	160	32.	1
Anthracene	290		ug/kg	120	40.	1
Benzo(ghi)perylene	1000		ug/kg	160	24.	1
Fluorene	51	J	ug/kg	210	20.	1
Phenanthrene	740		ug/kg	120	25.	1
Dibenzo(a,h)anthracene	260		ug/kg	120	24.	1
Indeno(1,2,3-cd)pyrene	1000		ug/kg	160	29.	1
Pyrene	2200		ug/kg	120	20.	1
Biphenyl	ND		ug/kg	470	48.	1
4-Chloroaniline	ND		ug/kg	210	38.	1
2-Nitroaniline	ND		ug/kg	210	40.	1
3-Nitroaniline	ND		ug/kg	210	39.	1
4-Nitroaniline	91	J	ug/kg	210	86.	1
Dibenzofuran	23	J	ug/kg	210	20.	1
2-Methylnaphthalene	49	J	ug/kg	250	25.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	210	22.	1
Acetophenone	56	J	ug/kg	210	26.	1
2,4,6-Trichlorophenol	ND		ug/kg	120	39.	1
p-Chloro-m-cresol	ND		ug/kg	210	31.	1
2-Chlorophenol	ND		ug/kg	210	24.	1
2,4-Dichlorophenol	ND		ug/kg	190	33.	1
2,4-Dimethylphenol	ND		ug/kg	210	68.	1
2-Nitrophenol	ND		ug/kg	450	78.	1
4-Nitrophenol	ND		ug/kg	290	84.	1
2,4-Dinitrophenol	ND		ug/kg	990	96.	1
4,6-Dinitro-o-cresol	ND		ug/kg	540	99.	1
Pentachlorophenol	ND		ug/kg	160	46.	1
Phenol	ND		ug/kg	210	31.	1
2-Methylphenol	ND		ug/kg	210	32.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	300	32.	1
2,4,5-Trichlorophenol	ND		ug/kg	210	40.	1
Benzoic Acid	ND		ug/kg	670	210	1
Benzyl Alcohol	ND		ug/kg	210	63.	1
Carbazole	110	J	ug/kg	210	20.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11 Date Collected: 12/14/17 11:05

Client ID: SB010 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	65		25-120
Phenol-d6	68		10-120
Nitrobenzene-d5	77		23-120
2-Fluorobiphenyl	69		30-120
2,4,6-Tribromophenol	86		10-136
4-Terphenyl-d14	61		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12
Client ID: SB010 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 15:56
Analyst: KR
Percent Solids: 89%

Date Collected: 12/14/17 11:10
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	190	18.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	32.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	37.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	ND		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	530	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	64.	1
Butyl benzyl phthalate	ND		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	35.	1
Di-n-octylphthalate	ND		ug/kg	190	63.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	39.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12 Date Collected: 12/14/17 11:10

Client ID: SB010 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	21.	1
Benzo(a)pyrene	ND		ug/kg	150	46.	1
Benzo(b)fluoranthene	ND		ug/kg	110	31.	1
Benzo(k)fluoranthene	ND		ug/kg	110	30.	1
Chrysene	ND		ug/kg	110	19.	1
Acenaphthylene	ND		ug/kg	150	29.	1
Anthracene	ND		ug/kg	110	36.	1
Benzo(ghi)perylene	ND		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	ND		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	26.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	420	43.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	35.	1
4-Nitroaniline	ND		ug/kg	190	77.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	19.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	400	70.	1
4-Nitrophenol	ND		ug/kg	260	76.	1
2,4-Dinitrophenol	ND		ug/kg	900	87.	1
4,6-Dinitro-o-cresol	ND		ug/kg	480	90.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	600	190	1
Benzyl Alcohol	ND		ug/kg	190	57.	1
Carbazole	ND		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12 Date Collected: 12/14/17 11:10

Client ID: SB010 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	84		25-120
Phenol-d6	84		10-120
Nitrobenzene-d5	88		23-120
2-Fluorobiphenyl	75		30-120
2,4,6-Tribromophenol	102		10-136
4-Terphenyl-d14	57		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13
Client ID: SB011 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/23/17 16:22
Analyst: KR
Percent Solids: 89%

Date Collected: 12/14/17 11:20
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	150	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	21.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	25.	1
2-Chloronaphthalene	ND		ug/kg	190	18.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	37.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	160		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	28.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	27.	1
Hexachlorocyclopentadiene	ND		ug/kg	530	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	ND		ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	21.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	65.	1
Butyl benzyl phthalate	310		ug/kg	190	47.	1
Di-n-butylphthalate	ND		ug/kg	190	35.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	17.	1
Dimethyl phthalate	ND		ug/kg	190	39.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13 Date Collected: 12/14/17 11:20

Client ID: SB011 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	110		ug/kg	110	21.	1
Benzo(a)pyrene	130	J	ug/kg	150	46.	1
Benzo(b)fluoranthene	180		ug/kg	110	31.	1
Benzo(k)fluoranthene	63	J	ug/kg	110	30.	1
Chrysene	130		ug/kg	110	19.	1
Acenaphthylene	59	J	ug/kg	150	29.	1
Anthracene	37	J	ug/kg	110	36.	1
Benzo(ghi)perylene	180		ug/kg	150	22.	1
Fluorene	ND		ug/kg	190	18.	1
Phenanthrene	72	J	ug/kg	110	23.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	160		ug/kg	150	26.	1
Pyrene	170		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	430	43.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	35.	1
4-Nitroaniline	ND		ug/kg	190	77.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	24	J	ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	35.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	400	70.	1
4-Nitrophenol	ND		ug/kg	260	76.	1
2,4-Dinitrophenol	ND		ug/kg	900	87.	1
4,6-Dinitro-o-cresol	ND		ug/kg	480	90.	1
Pentachlorophenol	ND		ug/kg	150	41.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	29.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	600	190	1
Benzyl Alcohol	ND		ug/kg	190	57.	1
Carbazole	ND		ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13 Date Collected: 12/14/17 11:20

Client ID: SB011 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	79		25-120
Phenol-d6	84		10-120
Nitrobenzene-d5	91		23-120
2-Fluorobiphenyl	86		30-120
2,4,6-Tribromophenol	95		10-136
4-Terphenyl-d14	78		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14
Client ID: SB011 (5-7)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/24/17 01:49
Analyst: TT
Percent Solids: 92%

Date Collected: 12/14/17 11:25
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 15:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	140	18.	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	20.	1
Hexachlorobenzene	ND		ug/kg	110	20.	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	24.	1
2-Chloronaphthalene	ND		ug/kg	180	18.	1
1,2-Dichlorobenzene	ND		ug/kg	180	32.	1
1,3-Dichlorobenzene	ND		ug/kg	180	30.	1
1,4-Dichlorobenzene	ND		ug/kg	180	31.	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	47.	1
2,4-Dinitrotoluene	ND		ug/kg	180	35.	1
2,6-Dinitrotoluene	ND		ug/kg	180	30.	1
Fluoranthene	ND		ug/kg	110	20.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	180	19.	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	27.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	210	30.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	18.	1
Hexachlorobutadiene	ND		ug/kg	180	26.	1
Hexachlorocyclopentadiene	ND		ug/kg	510	160	1
Hexachloroethane	ND		ug/kg	140	29.	1
Isophorone	ND		ug/kg	160	23.	1
Naphthalene	ND		ug/kg	180	22.	1
Nitrobenzene	ND		ug/kg	160	26.	1
NDPA/DPA	ND		ug/kg	140	20.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	180	27.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	61.	1
Butyl benzyl phthalate	ND		ug/kg	180	44.	1
Di-n-butylphthalate	ND		ug/kg	180	34.	1
Di-n-octylphthalate	ND		ug/kg	180	60.	1
Diethyl phthalate	ND		ug/kg	180	16.	1
Dimethyl phthalate	ND		ug/kg	180	37.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14 Date Collected: 12/14/17 11:25

Client ID: SB011 (5-7) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	20.	1
Benzo(a)pyrene	ND		ug/kg	140	43.	1
Benzo(b)fluoranthene	ND		ug/kg	110	30.	1
Benzo(k)fluoranthene	ND		ug/kg	110	28.	1
Chrysene	ND		ug/kg	110	18.	1
Acenaphthylene	ND		ug/kg	140	27.	1
Anthracene	ND		ug/kg	110	34.	1
Benzo(ghi)perylene	ND		ug/kg	140	21.	1
Fluorene	ND		ug/kg	180	17.	1
Phenanthrene	ND		ug/kg	110	22.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	20.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	25.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	400	41.	1
4-Chloroaniline	ND		ug/kg	180	32.	1
2-Nitroaniline	ND		ug/kg	180	34.	1
3-Nitroaniline	ND		ug/kg	180	33.	1
4-Nitroaniline	ND		ug/kg	180	73.	1
Dibenzofuran	ND		ug/kg	180	17.	1
2-Methylnaphthalene	ND		ug/kg	210	21.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	180	18.	1
Acetophenone	ND		ug/kg	180	22.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	34.	1
p-Chloro-m-cresol	ND		ug/kg	180	26.	1
2-Chlorophenol	ND		ug/kg	180	21.	1
2,4-Dichlorophenol	ND		ug/kg	160	28.	1
2,4-Dimethylphenol	ND		ug/kg	180	58.	1
2-Nitrophenol	ND		ug/kg	380	66.	1
4-Nitrophenol	ND		ug/kg	250	72.	1
2,4-Dinitrophenol	ND		ug/kg	850	82.	1
4,6-Dinitro-o-cresol	ND		ug/kg	460	85.	1
Pentachlorophenol	ND		ug/kg	140	39.	1
Phenol	ND		ug/kg	180	27.	1
2-Methylphenol	ND		ug/kg	180	27.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	250	28.	1
2,4,5-Trichlorophenol	ND		ug/kg	180	34.	1
Benzoic Acid	ND		ug/kg	570	180	1
Benzyl Alcohol	ND		ug/kg	180	54.	1
Carbazole	ND		ug/kg	180	17.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14 Date Collected: 12/14/17 11:25

Client ID: SB011 (5-7) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	78		25-120
Phenol-d6	83		10-120
Nitrobenzene-d5	73		23-120
2-Fluorobiphenyl	82		30-120
2,4,6-Tribromophenol	83		10-136
4-Terphenyl-d14	78		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15
Client ID: SB012 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/24/17 04:21
Analyst: TT
Percent Solids: 88%

Date Collected: 12/14/17 11:40
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 15:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	25	J	ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	32.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	970		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	30.	1
Isophorone	ND		ug/kg	170	24.	1
Naphthalene	23	J	ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	65.	1
Butyl benzyl phthalate	ND		ug/kg	190	48.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	18.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15 Date Collected: 12/14/17 11:40

Client ID: SB012 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	540		ug/kg	110	21.	1
Benzo(a)pyrene	520		ug/kg	150	46.	1
Benzo(b)fluoranthene	740		ug/kg	110	32.	1
Benzo(k)fluoranthene	230		ug/kg	110	30.	1
Chrysene	620		ug/kg	110	20.	1
Acenaphthylene	120	J	ug/kg	150	29.	1
Anthracene	100	J	ug/kg	110	37.	1
Benzo(ghi)perylene	410		ug/kg	150	22.	1
Fluorene	25	J	ug/kg	190	18.	1
Phenanthrene	460		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	110		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	420		ug/kg	150	26.	1
Pyrene	900		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	ND		ug/kg	190	18.	1
2-Methylnaphthalene	ND		ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	62.	1
2-Nitrophenol	ND		ug/kg	410	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	910	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	91.	1
Pentachlorophenol	ND		ug/kg	150	42.	1
Phenol	ND		ug/kg	190	28.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	53	J	ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15 Date Collected: 12/14/17 11:40

Client ID: SB012 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	79		25-120
Phenol-d6	80		10-120
Nitrobenzene-d5	80		23-120
2-Fluorobiphenyl	89		30-120
2,4,6-Tribromophenol	80		10-136
4-Terphenyl-d14	80		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16
Client ID: SB012 (6-8)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/24/17 02:14
Analyst: TT
Percent Solids: 92%

Date Collected: 12/14/17 11:45
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 15:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/kg	140	19.	1
1,2,4-Trichlorobenzene	ND		ug/kg	180	20.	1
Hexachlorobenzene	ND		ug/kg	110	20.	1
Bis(2-chloroethyl)ether	ND		ug/kg	160	24.	1
2-Chloronaphthalene	ND		ug/kg	180	18.	1
1,2-Dichlorobenzene	ND		ug/kg	180	32.	1
1,3-Dichlorobenzene	ND		ug/kg	180	31.	1
1,4-Dichlorobenzene	ND		ug/kg	180	31.	1
3,3'-Dichlorobenzidine	ND		ug/kg	180	48.	1
2,4-Dinitrotoluene	ND		ug/kg	180	36.	1
2,6-Dinitrotoluene	ND		ug/kg	180	31.	1
Fluoranthene	ND		ug/kg	110	21.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	180	19.	1
4-Bromophenyl phenyl ether	ND		ug/kg	180	27.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	220	31.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	190	18.	1
Hexachlorobutadiene	ND		ug/kg	180	26.	1
Hexachlorocyclopentadiene	ND		ug/kg	510	160	1
Hexachloroethane	ND		ug/kg	140	29.	1
Isophorone	ND		ug/kg	160	23.	1
Naphthalene	ND		ug/kg	180	22.	1
Nitrobenzene	ND		ug/kg	160	26.	1
NDPA/DPA	ND		ug/kg	140	20.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	180	28.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	180	62.	1
Butyl benzyl phthalate	ND		ug/kg	180	45.	1
Di-n-butylphthalate	ND		ug/kg	180	34.	1
Di-n-octylphthalate	ND		ug/kg	180	61.	1
Diethyl phthalate	ND		ug/kg	180	17.	1
Dimethyl phthalate	ND		ug/kg	180	38.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16 Date Collected: 12/14/17 11:45

Client ID: SB012 (6-8) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/kg	110	20.	1
Benzo(a)pyrene	ND		ug/kg	140	44.	1
Benzo(b)fluoranthene	ND		ug/kg	110	30.	1
Benzo(k)fluoranthene	ND		ug/kg	110	29.	1
Chrysene	ND		ug/kg	110	19.	1
Acenaphthylene	ND		ug/kg	140	28.	1
Anthracene	ND		ug/kg	110	35.	1
Benzo(ghi)perylene	ND		ug/kg	140	21.	1
Fluorene	ND		ug/kg	180	17.	1
Phenanthrene	ND		ug/kg	110	22.	1
Dibenzo(a,h)anthracene	ND		ug/kg	110	21.	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	140	25.	1
Pyrene	ND		ug/kg	110	18.	1
Biphenyl	ND		ug/kg	410	42.	1
4-Chloroaniline	ND		ug/kg	180	33.	1
2-Nitroaniline	ND		ug/kg	180	35.	1
3-Nitroaniline	ND		ug/kg	180	34.	1
4-Nitroaniline	ND		ug/kg	180	74.	1
Dibenzofuran	ND		ug/kg	180	17.	1
2-Methylnaphthalene	ND		ug/kg	220	22.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	180	19.	1
Acetophenone	ND		ug/kg	180	22.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	34.	1
p-Chloro-m-cresol	ND		ug/kg	180	27.	1
2-Chlorophenol	ND		ug/kg	180	21.	1
2,4-Dichlorophenol	ND		ug/kg	160	29.	1
2,4-Dimethylphenol	ND		ug/kg	180	59.	1
2-Nitrophenol	ND		ug/kg	390	68.	1
4-Nitrophenol	ND		ug/kg	250	73.	1
2,4-Dinitrophenol	ND		ug/kg	860	84.	1
4,6-Dinitro-o-cresol	ND		ug/kg	470	86.	1
Pentachlorophenol	ND		ug/kg	140	40.	1
Phenol	ND		ug/kg	180	27.	1
2-Methylphenol	ND		ug/kg	180	28.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	260	28.	1
2,4,5-Trichlorophenol	ND		ug/kg	180	34.	1
Benzoic Acid	ND		ug/kg	580	180	1
Benzyl Alcohol	ND		ug/kg	180	55.	1
Carbazole	ND		ug/kg	180	17.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16 Date Collected: 12/14/17 11:45

Client ID: SB012 (6-8) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	74		25-120
Phenol-d6	82		10-120
Nitrobenzene-d5	80		23-120
2-Fluorobiphenyl	89		30-120
2,4,6-Tribromophenol	79		10-136
4-Terphenyl-d14	94		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17
Client ID: DUP002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8270D
Analytical Date: 12/24/17 05:38
Analyst: TT
Percent Solids: 87%

Date Collected: 12/14/17 00:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 15:25

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	100	J	ug/kg	150	20.	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	22.	1
Hexachlorobenzene	ND		ug/kg	110	21.	1
Bis(2-chloroethyl)ether	ND		ug/kg	170	26.	1
2-Chloronaphthalene	ND		ug/kg	190	19.	1
1,2-Dichlorobenzene	ND		ug/kg	190	34.	1
1,3-Dichlorobenzene	ND		ug/kg	190	33.	1
1,4-Dichlorobenzene	ND		ug/kg	190	33.	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	50.	1
2,4-Dinitrotoluene	ND		ug/kg	190	38.	1
2,6-Dinitrotoluene	ND		ug/kg	190	32.	1
Fluoranthene	1800		ug/kg	110	22.	1
4-Chlorophenyl phenyl ether	ND		ug/kg	190	20.	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	29.	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	230	32.	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	19.	1
Hexachlorobutadiene	ND		ug/kg	190	28.	1
Hexachlorocyclopentadiene	ND		ug/kg	540	170	1
Hexachloroethane	ND		ug/kg	150	31.	1
Isophorone	ND		ug/kg	170	25.	1
Naphthalene	170	J	ug/kg	190	23.	1
Nitrobenzene	ND		ug/kg	170	28.	1
NDPA/DPA	ND		ug/kg	150	22.	1
n-Nitrosodi-n-propylamine	ND		ug/kg	190	29.	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	66.	1
Butyl benzyl phthalate	ND		ug/kg	190	48.	1
Di-n-butylphthalate	ND		ug/kg	190	36.	1
Di-n-octylphthalate	ND		ug/kg	190	64.	1
Diethyl phthalate	ND		ug/kg	190	18.	1
Dimethyl phthalate	ND		ug/kg	190	40.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17 Date Collected: 12/14/17 00:00

Client ID: DUP002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	940		ug/kg	110	21.	1
Benzo(a)pyrene	830		ug/kg	150	46.	1
Benzo(b)fluoranthene	1200		ug/kg	110	32.	1
Benzo(k)fluoranthene	350		ug/kg	110	30.	1
Chrysene	1000		ug/kg	110	20.	1
Acenaphthylene	160		ug/kg	150	29.	1
Anthracene	320		ug/kg	110	37.	1
Benzo(ghi)perylene	610		ug/kg	150	22.	1
Fluorene	110	J	ug/kg	190	18.	1
Phenanthrene	1200		ug/kg	110	23.	1
Dibenzo(a,h)anthracene	160		ug/kg	110	22.	1
Indeno(1,2,3-cd)pyrene	620		ug/kg	150	26.	1
Pyrene	1500		ug/kg	110	19.	1
Biphenyl	ND		ug/kg	430	44.	1
4-Chloroaniline	ND		ug/kg	190	34.	1
2-Nitroaniline	ND		ug/kg	190	36.	1
3-Nitroaniline	ND		ug/kg	190	36.	1
4-Nitroaniline	ND		ug/kg	190	78.	1
Dibenzofuran	74	J	ug/kg	190	18.	1
2-Methylnaphthalene	120	J	ug/kg	230	23.	1
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	190	20.	1
Acetophenone	ND		ug/kg	190	23.	1
2,4,6-Trichlorophenol	ND		ug/kg	110	36.	1
p-Chloro-m-cresol	ND		ug/kg	190	28.	1
2-Chlorophenol	ND		ug/kg	190	22.	1
2,4-Dichlorophenol	ND		ug/kg	170	30.	1
2,4-Dimethylphenol	ND		ug/kg	190	63.	1
2-Nitrophenol	ND		ug/kg	410	71.	1
4-Nitrophenol	ND		ug/kg	260	77.	1
2,4-Dinitrophenol	ND		ug/kg	910	88.	1
4,6-Dinitro-o-cresol	ND		ug/kg	490	91.	1
Pentachlorophenol	ND		ug/kg	150	42.	1
Phenol	ND		ug/kg	190	29.	1
2-Methylphenol	ND		ug/kg	190	29.	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	30.	1
2,4,5-Trichlorophenol	ND		ug/kg	190	36.	1
Benzoic Acid	ND		ug/kg	610	190	1
Benzyl Alcohol	ND		ug/kg	190	58.	1
Carbazole	120	J	ug/kg	190	18.	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17 Date Collected: 12/14/17 00:00

Client ID: DUP002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	84		25-120
Phenol-d6	78		10-120
Nitrobenzene-d5	88		23-120
2-Fluorobiphenyl	84		30-120
2,4,6-Tribromophenol	78		10-136
4-Terphenyl-d14	65		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18
Client ID: FIELDBLANK002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 12/21/17 14:47
Analyst: ALS

Date Collected: 12/14/17 12:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 12/20/17 12:22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Acenaphthene	ND		ug/l	2.0	0.59	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	0.66	1
Hexachlorobenzene	ND		ug/l	2.0	0.58	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	0.67	1
2-Chloronaphthalene	ND		ug/l	2.0	0.64	1
1,2-Dichlorobenzene	ND		ug/l	2.0	0.73	1
1,3-Dichlorobenzene	ND		ug/l	2.0	0.69	1
1,4-Dichlorobenzene	ND		ug/l	2.0	0.71	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	1.4	1
2,4-Dinitrotoluene	ND		ug/l	5.0	0.84	1
2,6-Dinitrotoluene	ND		ug/l	5.0	1.1	1
Fluoranthene	ND		ug/l	2.0	0.57	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	0.62	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	0.73	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	0.70	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	0.63	1
Hexachlorobutadiene	ND		ug/l	2.0	0.72	1
Hexachlorocyclopentadiene	ND		ug/l	20	7.8	1
Hexachloroethane	ND		ug/l	2.0	0.68	1
Isophorone	ND		ug/l	5.0	0.60	1
Naphthalene	ND		ug/l	2.0	0.68	1
Nitrobenzene	ND		ug/l	2.0	0.75	1
NDPA/DPA	ND		ug/l	2.0	0.64	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	0.70	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	0.91	1
Butyl benzyl phthalate	ND		ug/l	5.0	1.3	1
Di-n-butylphthalate	ND		ug/l	5.0	0.69	1
Di-n-octylphthalate	ND		ug/l	5.0	1.1	1
Diethyl phthalate	ND		ug/l	5.0	0.63	1
Dimethyl phthalate	ND		ug/l	5.0	0.65	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18 Date Collected: 12/14/17 12:00

Client ID: FIELDBLANK002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzo(a)anthracene	ND		ug/l	2.0	0.61	1
Benzo(a)pyrene	ND		ug/l	2.0	0.54	1
Benzo(b)fluoranthene	ND		ug/l	2.0	0.64	1
Benzo(k)fluoranthene	ND		ug/l	2.0	0.60	1
Chrysene	ND		ug/l	2.0	0.54	1
Acenaphthylene	ND		ug/l	2.0	0.66	1
Anthracene	ND		ug/l	2.0	0.64	1
Benzo(ghi)perylene	ND		ug/l	2.0	0.61	1
Fluorene	ND		ug/l	2.0	0.62	1
Phenanthrene	ND		ug/l	2.0	0.61	1
Dibenzo(a,h)anthracene	ND		ug/l	2.0	0.55	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	0.71	1
Pyrene	ND		ug/l	2.0	0.57	1
Biphenyl	ND		ug/l	2.0	0.76	1
4-Chloroaniline	0.86	J	ug/l	5.0	0.63	1
2-Nitroaniline	ND		ug/l	5.0	1.1	1
3-Nitroaniline	ND		ug/l	5.0	1.2	1
4-Nitroaniline	ND		ug/l	5.0	1.3	1
Dibenzofuran	ND		ug/l	2.0	0.66	1
2-Methylnaphthalene	ND		ug/l	2.0	0.72	1
1,2,4,5-Tetrachlorobenzene	ND		ug/l	10	0.67	1
Acetophenone	ND		ug/l	5.0	0.85	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	0.68	1
p-Chloro-m-cresol	ND		ug/l	2.0	0.62	1
2-Chlorophenol	ND		ug/l	2.0	0.63	1
2,4-Dichlorophenol	ND		ug/l	5.0	0.77	1
2,4-Dimethylphenol	ND		ug/l	5.0	1.6	1
2-Nitrophenol	ND		ug/l	10	1.5	1
4-Nitrophenol	ND		ug/l	10	1.8	1
2,4-Dinitrophenol	ND		ug/l	20	5.5	1
4,6-Dinitro-o-cresol	ND		ug/l	10	2.1	1
Pentachlorophenol	ND		ug/l	10	3.4	1
Phenol	ND		ug/l	5.0	1.9	1
2-Methylphenol	ND		ug/l	5.0	1.0	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	1.1	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	0.72	1
Benzoic Acid	ND		ug/l	50	13.	1
Benzyl Alcohol	0.88	J	ug/l	2.0	0.72	1
Carbazole	ND		ug/l	2.0	0.63	1

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18 Date Collected: 12/14/17 12:00

Client ID: FIELDBLANK002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Semivolatile Organics by GC/MS - Westborough Lab

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	52		21-120
Phenol-d6	35		10-120
Nitrobenzene-d5	82		23-120
2-Fluorobiphenyl	94		15-120
2,4,6-Tribromophenol	102		10-120
4-Terphenyl-d14	100		41-149

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/21/17 10:31
Analyst: SZ

Extraction Method: EPA 3510C
Extraction Date: 12/20/17 10:56

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 18 Batch: WG1074914-1					
Acenaphthene	ND		ug/l	2.0	0.59
1,2,4-Trichlorobenzene	ND		ug/l	5.0	0.66
Hexachlorobenzene	ND		ug/l	2.0	0.58
Bis(2-chloroethyl)ether	ND		ug/l	2.0	0.67
2-Chloronaphthalene	ND		ug/l	2.0	0.64
1,2-Dichlorobenzene	ND		ug/l	2.0	0.73
1,3-Dichlorobenzene	ND		ug/l	2.0	0.69
1,4-Dichlorobenzene	ND		ug/l	2.0	0.71
3,3'-Dichlorobenzidine	ND		ug/l	5.0	1.4
2,4-Dinitrotoluene	ND		ug/l	5.0	0.84
2,6-Dinitrotoluene	ND		ug/l	5.0	1.1
Fluoranthene	ND		ug/l	2.0	0.57
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	0.62
4-Bromophenyl phenyl ether	ND		ug/l	2.0	0.73
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	0.70
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	0.63
Hexachlorobutadiene	ND		ug/l	2.0	0.72
Hexachlorocyclopentadiene	ND		ug/l	20	7.8
Hexachloroethane	ND		ug/l	2.0	0.68
Isophorone	ND		ug/l	5.0	0.60
Naphthalene	ND		ug/l	2.0	0.68
Nitrobenzene	ND		ug/l	2.0	0.75
NDPA/DPA	ND		ug/l	2.0	0.64
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	0.70
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	0.91
Butyl benzyl phthalate	ND		ug/l	5.0	1.3
Di-n-butylphthalate	ND		ug/l	5.0	0.69
Di-n-octylphthalate	ND		ug/l	5.0	1.1
Diethyl phthalate	ND		ug/l	5.0	0.63

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/21/17 10:31
Analyst: SZ

Extraction Method: EPA 3510C
Extraction Date: 12/20/17 10:56

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 18 Batch: WG1074914-1					
Dimethyl phthalate	ND		ug/l	5.0	0.65
Benzo(a)anthracene	ND		ug/l	2.0	0.61
Benzo(a)pyrene	0.87	J	ug/l	2.0	0.54
Benzo(b)fluoranthene	0.89	J	ug/l	2.0	0.64
Benzo(k)fluoranthene	0.71	J	ug/l	2.0	0.60
Chrysene	ND		ug/l	2.0	0.54
Acenaphthylene	ND		ug/l	2.0	0.66
Anthracene	ND		ug/l	2.0	0.64
Benzo(ghi)perylene	ND		ug/l	2.0	0.61
Fluorene	ND		ug/l	2.0	0.62
Phenanthrene	ND		ug/l	2.0	0.61
Dibenzo(a,h)anthracene	ND		ug/l	2.0	0.55
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	0.71
Pyrene	ND		ug/l	2.0	0.57
Biphenyl	ND		ug/l	2.0	0.76
4-Chloroaniline	ND		ug/l	5.0	0.63
2-Nitroaniline	ND		ug/l	5.0	1.1
3-Nitroaniline	ND		ug/l	5.0	1.2
4-Nitroaniline	ND		ug/l	5.0	1.3
Dibenzofuran	ND		ug/l	2.0	0.66
2-Methylnaphthalene	ND		ug/l	2.0	0.72
1,2,4,5-Tetrachlorobenzene	ND		ug/l	10	0.67
Acetophenone	ND		ug/l	5.0	0.85
2,4,6-Trichlorophenol	ND		ug/l	5.0	0.68
p-Chloro-m-cresol	ND		ug/l	2.0	0.62
2-Chlorophenol	ND		ug/l	2.0	0.63
2,4-Dichlorophenol	ND		ug/l	5.0	0.77
2,4-Dimethylphenol	ND		ug/l	5.0	1.6
2-Nitrophenol	ND		ug/l	10	1.5

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/21/17 10:31
Analyst: SZ

Extraction Method: EPA 3510C
Extraction Date: 12/20/17 10:56

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 18 Batch: WG1074914-1					
4-Nitrophenol	ND		ug/l	10	1.8
2,4-Dinitrophenol	ND		ug/l	20	5.5
4,6-Dinitro-o-cresol	ND		ug/l	10	2.1
Pentachlorophenol	ND		ug/l	10	3.4
Phenol	ND		ug/l	5.0	1.9
2-Methylphenol	ND		ug/l	5.0	1.0
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	1.1
2,4,5-Trichlorophenol	ND		ug/l	5.0	0.72
Benzoic Acid	ND		ug/l	50	13.
Benzyl Alcohol	ND		ug/l	2.0	0.72
Carbazole	ND		ug/l	2.0	0.63
Tentatively Identified Compounds					
Total TIC Compounds	5.53	J	ug/l		
Unknown	5.53	J	ug/l		

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	55		21-120
Phenol-d6	39		10-120
Nitrobenzene-d5	99		23-120
2-Fluorobiphenyl	102		15-120
2,4,6-Tribromophenol	103		10-120
4-Terphenyl-d14	92		41-149

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/21/17 22:51
Analyst: CB

Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-13 Batch: WG1075347-1					
Acenaphthene	ND		ug/kg	130	17.
1,2,4-Trichlorobenzene	ND		ug/kg	160	19.
Hexachlorobenzene	ND		ug/kg	98	18.
Bis(2-chloroethyl)ether	ND		ug/kg	150	22.
2-Chloronaphthalene	ND		ug/kg	160	16.
1,2-Dichlorobenzene	ND		ug/kg	160	29.
1,3-Dichlorobenzene	ND		ug/kg	160	28.
1,4-Dichlorobenzene	ND		ug/kg	160	28.
3,3'-Dichlorobenzidine	ND		ug/kg	160	43.
2,4-Dinitrotoluene	ND		ug/kg	160	32.
2,6-Dinitrotoluene	ND		ug/kg	160	28.
Fluoranthene	ND		ug/kg	98	19.
4-Chlorophenyl phenyl ether	ND		ug/kg	160	17.
4-Bromophenyl phenyl ether	ND		ug/kg	160	25.
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	28.
Bis(2-chloroethoxy)methane	ND		ug/kg	180	16.
Hexachlorobutadiene	ND		ug/kg	160	24.
Hexachlorocyclopentadiene	ND		ug/kg	460	150
Hexachloroethane	ND		ug/kg	130	26.
Isophorone	ND		ug/kg	150	21.
Naphthalene	ND		ug/kg	160	20.
Nitrobenzene	ND		ug/kg	150	24.
NDPA/DPA	ND		ug/kg	130	18.
n-Nitrosodi-n-propylamine	ND		ug/kg	160	25.
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	56.
Butyl benzyl phthalate	ND		ug/kg	160	41.
Di-n-butylphthalate	ND		ug/kg	160	31.
Di-n-octylphthalate	ND		ug/kg	160	55.
Diethyl phthalate	ND		ug/kg	160	15.

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/21/17 22:51
Analyst: CB

Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-13 Batch: WG1075347-1					
Dimethyl phthalate	ND		ug/kg	160	34.
Benzo(a)anthracene	ND		ug/kg	98	18.
Benzo(a)pyrene	ND		ug/kg	130	40.
Benzo(b)fluoranthene	ND		ug/kg	98	27.
Benzo(k)fluoranthene	ND		ug/kg	98	26.
Chrysene	ND		ug/kg	98	17.
Acenaphthylene	ND		ug/kg	130	25.
Anthracene	ND		ug/kg	98	32.
Benzo(ghi)perylene	ND		ug/kg	130	19.
Fluorene	ND		ug/kg	160	16.
Phenanthrene	ND		ug/kg	98	20.
Dibenzo(a,h)anthracene	ND		ug/kg	98	19.
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	23.
Pyrene	ND		ug/kg	98	16.
Biphenyl	ND		ug/kg	370	38.
4-Chloroaniline	ND		ug/kg	160	30.
2-Nitroaniline	ND		ug/kg	160	31.
3-Nitroaniline	ND		ug/kg	160	31.
4-Nitroaniline	ND		ug/kg	160	67.
Dibenzofuran	ND		ug/kg	160	15.
2-Methylnaphthalene	ND		ug/kg	200	20.
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	160	17.
Acetophenone	ND		ug/kg	160	20.
2,4,6-Trichlorophenol	ND		ug/kg	98	31.
p-Chloro-m-cresol	ND		ug/kg	160	24.
2-Chlorophenol	ND		ug/kg	160	19.
2,4-Dichlorophenol	ND		ug/kg	150	26.
2,4-Dimethylphenol	ND		ug/kg	160	54.
2-Nitrophenol	ND		ug/kg	350	61.

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/21/17 22:51
Analyst: CB

Extraction Method: EPA 3546
Extraction Date: 12/21/17 09:17

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-13 Batch: WG1075347-1					
4-Nitrophenol	ND		ug/kg	230	66.
2,4-Dinitrophenol	ND		ug/kg	780	76.
4,6-Dinitro-o-cresol	ND		ug/kg	420	78.
Pentachlorophenol	ND		ug/kg	130	36.
Phenol	ND		ug/kg	160	24.
2-Methylphenol	ND		ug/kg	160	25.
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	25.
2,4,5-Trichlorophenol	ND		ug/kg	160	31.
Benzoic Acid	ND		ug/kg	530	160
Benzyl Alcohol	ND		ug/kg	160	50.
Carbazole	ND		ug/kg	160	16.
Tentatively Identified Compounds					
No Tentatively Identified Compounds	ND		ug/kg		

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	57		25-120
Phenol-d6	61		10-120
Nitrobenzene-d5	61		23-120
2-Fluorobiphenyl	63		30-120
2,4,6-Tribromophenol	77		10-136
4-Terphenyl-d14	73		18-120

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/23/17 23:42
Analyst: EK

Extraction Method: EPA 3546
Extraction Date: 12/21/17 15:25

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 14-17 Batch: WG1075523-1					
Acenaphthene	ND		ug/kg	130	17.
1,2,4-Trichlorobenzene	ND		ug/kg	160	19.
Hexachlorobenzene	ND		ug/kg	98	18.
Bis(2-chloroethyl)ether	ND		ug/kg	150	22.
2-Chloronaphthalene	ND		ug/kg	160	16.
1,2-Dichlorobenzene	ND		ug/kg	160	29.
1,3-Dichlorobenzene	ND		ug/kg	160	28.
1,4-Dichlorobenzene	ND		ug/kg	160	28.
3,3'-Dichlorobenzidine	ND		ug/kg	160	43.
2,4-Dinitrotoluene	ND		ug/kg	160	33.
2,6-Dinitrotoluene	ND		ug/kg	160	28.
Fluoranthene	ND		ug/kg	98	19.
4-Chlorophenyl phenyl ether	ND		ug/kg	160	17.
4-Bromophenyl phenyl ether	ND		ug/kg	160	25.
Bis(2-chloroisopropyl)ether	ND		ug/kg	200	28.
Bis(2-chloroethoxy)methane	ND		ug/kg	180	16.
Hexachlorobutadiene	ND		ug/kg	160	24.
Hexachlorocyclopentadiene	ND		ug/kg	470	150
Hexachloroethane	ND		ug/kg	130	26.
Isophorone	ND		ug/kg	150	21.
Naphthalene	ND		ug/kg	160	20.
Nitrobenzene	ND		ug/kg	150	24.
NDPA/DPA	ND		ug/kg	130	18.
n-Nitrosodi-n-propylamine	ND		ug/kg	160	25.
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	56.
Butyl benzyl phthalate	ND		ug/kg	160	41.
Di-n-butylphthalate	ND		ug/kg	160	31.
Di-n-octylphthalate	ND		ug/kg	160	55.
Diethyl phthalate	ND		ug/kg	160	15.

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/23/17 23:42
Analyst: EK

Extraction Method: EPA 3546
Extraction Date: 12/21/17 15:25

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 14-17 Batch: WG1075523-1					
Dimethyl phthalate	ND		ug/kg	160	34.
Benzo(a)anthracene	ND		ug/kg	98	18.
Benzo(a)pyrene	ND		ug/kg	130	40.
Benzo(b)fluoranthene	ND		ug/kg	98	27.
Benzo(k)fluoranthene	ND		ug/kg	98	26.
Chrysene	ND		ug/kg	98	17.
Acenaphthylene	ND		ug/kg	130	25.
Anthracene	ND		ug/kg	98	32.
Benzo(ghi)perylene	ND		ug/kg	130	19.
Fluorene	ND		ug/kg	160	16.
Phenanthrene	ND		ug/kg	98	20.
Dibenzo(a,h)anthracene	ND		ug/kg	98	19.
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	23.
Pyrene	ND		ug/kg	98	16.
Biphenyl	ND		ug/kg	370	38.
4-Chloroaniline	ND		ug/kg	160	30.
2-Nitroaniline	ND		ug/kg	160	31.
3-Nitroaniline	ND		ug/kg	160	31.
4-Nitroaniline	ND		ug/kg	160	68.
Dibenzofuran	ND		ug/kg	160	15.
2-Methylnaphthalene	ND		ug/kg	200	20.
1,2,4,5-Tetrachlorobenzene	ND		ug/kg	160	17.
Acetophenone	ND		ug/kg	160	20.
2,4,6-Trichlorophenol	ND		ug/kg	98	31.
p-Chloro-m-cresol	ND		ug/kg	160	24.
2-Chlorophenol	ND		ug/kg	160	19.
2,4-Dichlorophenol	ND		ug/kg	150	26.
2,4-Dimethylphenol	ND		ug/kg	160	54.
2-Nitrophenol	ND		ug/kg	350	61.

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 12/23/17 23:42
Analyst: EK

Extraction Method: EPA 3546
Extraction Date: 12/21/17 15:25

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 14-17 Batch: WG1075523-1					
4-Nitrophenol	ND		ug/kg	230	66.
2,4-Dinitrophenol	ND		ug/kg	780	76.
4,6-Dinitro-o-cresol	ND		ug/kg	420	78.
Pentachlorophenol	ND		ug/kg	130	36.
Phenol	ND		ug/kg	160	25.
2-Methylphenol	ND		ug/kg	160	25.
3-Methylphenol/4-Methylphenol	ND		ug/kg	230	26.
2,4,5-Trichlorophenol	ND		ug/kg	160	31.
Benzoic Acid	ND		ug/kg	530	160
Benzyl Alcohol	ND		ug/kg	160	50.
Carbazole	ND		ug/kg	160	16.
Tentatively Identified Compounds					
No Tentatively Identified Compounds	ND		ug/kg		

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	80		25-120
Phenol-d6	80		10-120
Nitrobenzene-d5	72		23-120
2-Fluorobiphenyl	77		30-120
2,4,6-Tribromophenol	76		10-136
4-Terphenyl-d14	80		18-120

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 18 Batch: WG1074914-2 WG1074914-3								
Acenaphthene	89		90		37-111	1		30
1,2,4-Trichlorobenzene	82		81		39-98	1		30
Hexachlorobenzene	97		105		40-140	8		30
Bis(2-chloroethyl)ether	86		86		40-140	0		30
2-Chloronaphthalene	97		97		40-140	0		30
1,2-Dichlorobenzene	74		74		40-140	0		30
1,3-Dichlorobenzene	71		71		40-140	0		30
1,4-Dichlorobenzene	72		71		36-97	1		30
3,3'-Dichlorobenzidine	84		77		40-140	9		30
2,4-Dinitrotoluene	111		111		48-143	0		30
2,6-Dinitrotoluene	118		122		40-140	3		30
Fluoranthene	94		94		40-140	0		30
4-Chlorophenyl phenyl ether	96		99		40-140	3		30
4-Bromophenyl phenyl ether	97		105		40-140	8		30
Bis(2-chloroisopropyl)ether	86		85		40-140	1		30
Bis(2-chloroethoxy)methane	99		97		40-140	2		30
Hexachlorobutadiene	74		76		40-140	3		30
Hexachlorocyclopentadiene	69		70		40-140	1		30
Hexachloroethane	70		69		40-140	1		30
Isophorone	100		98		40-140	2		30
Naphthalene	81		84		40-140	4		30
Nitrobenzene	91		91		40-140	0		30
NDPA/DPA	99		109		40-140	10		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 18 Batch: WG1074914-2 WG1074914-3								
n-Nitrosodi-n-propylamine	99		96		29-132	3		30
Bis(2-ethylhexyl)phthalate	114		117		40-140	3		30
Butyl benzyl phthalate	104		107		40-140	3		30
Di-n-butylphthalate	102		105		40-140	3		30
Di-n-octylphthalate	103		108		40-140	5		30
Diethyl phthalate	100		101		40-140	1		30
Dimethyl phthalate	111		109		40-140	2		30
Benzo(a)anthracene	96		96		40-140	0		30
Benzo(a)pyrene	91		92		40-140	1		30
Benzo(b)fluoranthene	89		94		40-140	5		30
Benzo(k)fluoranthene	91		92		40-140	1		30
Chrysene	95		97		40-140	2		30
Acenaphthylene	104		105		45-123	1		30
Anthracene	97		97		40-140	0		30
Benzo(ghi)perylene	104		96		40-140	8		30
Fluorene	98		101		40-140	3		30
Phenanthrene	96		94		40-140	2		30
Dibenzo(a,h)anthracene	104		96		40-140	8		30
Indeno(1,2,3-cd)pyrene	108		98		40-140	10		30
Pyrene	92		93		26-127	1		30
Biphenyl	103		104		40-140	1		30
4-Chloroaniline	61		53		40-140	14		30
2-Nitroaniline	124		124		52-143	0		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 18 Batch: WG1074914-2 WG1074914-3								
3-Nitroaniline	78		69		25-145	12		30
4-Nitroaniline	99		108		51-143	9		30
Dibenzofuran	94		94		40-140	0		30
2-Methylnaphthalene	89		91		40-140	2		30
1,2,4,5-Tetrachlorobenzene	96		98		2-134	2		30
Acetophenone	99		97		39-129	2		30
2,4,6-Trichlorophenol	112		113		30-130	1		30
p-Chloro-m-cresol	**108**	Q	**109**	Q	23-97	1		30
2-Chlorophenol	87		88		27-123	1		30
2,4-Dichlorophenol	108		106		30-130	2		30
2,4-Dimethylphenol	95		98		30-130	3		30
2-Nitrophenol	115		112		30-130	3		30
4-Nitrophenol	66		68		10-80	3		30
2,4-Dinitrophenol	111		108		20-130	3		30
4,6-Dinitro-o-cresol	125		137		20-164	9		30
Pentachlorophenol	91		98		9-103	7		30
Phenol	43		44		12-110	2		30
2-Methylphenol	85		82		30-130	4		30
3-Methylphenol/4-Methylphenol	81		80		30-130	1		30
2,4,5-Trichlorophenol	117		115		30-130	2		30
Benzoic Acid	42		44		10-164	5		30
Benzyl Alcohol	82		82		26-116	0		30
Carbazole	101		102		55-144	1		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 18 Batch: WG1074914-2 WG1074914-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	54		55		21-120
Phenol-d6	40		40		10-120
Nitrobenzene-d5	90		89		23-120
2-Fluorobiphenyl	96		99		15-120
2,4,6-Tribromophenol	103		115		10-120
4-Terphenyl-d14	88		89		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 Batch: WG1075347-2 WG1075347-3								
Acenaphthene	75		86		31-137	14		50
1,2,4-Trichlorobenzene	74		81		38-107	9		50
Hexachlorobenzene	82		88		40-140	7		50
Bis(2-chloroethyl)ether	69		74		40-140	7		50
2-Chloronaphthalene	77		88		40-140	13		50
1,2-Dichlorobenzene	71		76		40-140	7		50
1,3-Dichlorobenzene	69		75		40-140	8		50
1,4-Dichlorobenzene	70		76		28-104	8		50
3,3'-Dichlorobenzidine	**39**	Q	43		40-140	10		50
2,4-Dinitrotoluene	91		103		40-132	12		50
2,6-Dinitrotoluene	86		97		40-140	12		50
Fluoranthene	79		88		40-140	11		50
4-Chlorophenyl phenyl ether	78		88		40-140	12		50
4-Bromophenyl phenyl ether	80		90		40-140	12		50
Bis(2-chloroisopropyl)ether	66		71		40-140	7		50
Bis(2-chloroethoxy)methane	72		80		40-117	11		50
Hexachlorobutadiene	79		89		40-140	12		50
Hexachlorocyclopentadiene	75		82		40-140	9		50
Hexachloroethane	72		77		40-140	7		50
Isophorone	73		81		40-140	10		50
Naphthalene	73		83		40-140	13		50
Nitrobenzene	76		83		40-140	9		50
NDPA/DPA	78		87		36-157	11		50

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 Batch: WG1075347-2 WG1075347-3								
n-Nitrosodi-n-propylamine	73		83		32-121	13		50
Bis(2-ethylhexyl)phthalate	77		86		40-140	11		50
Butyl benzyl phthalate	86		92		40-140	7		50
Di-n-butylphthalate	79		88		40-140	11		50
Di-n-octylphthalate	78		87		40-140	11		50
Diethyl phthalate	80		89		40-140	11		50
Dimethyl phthalate	79		90		40-140	13		50
Benzo(a)anthracene	75		84		40-140	11		50
Benzo(a)pyrene	78		84		40-140	7		50
Benzo(b)fluoranthene	79		84		40-140	6		50
Benzo(k)fluoranthene	77		85		40-140	10		50
Chrysene	75		83		40-140	10		50
Acenaphthylene	77		87		40-140	12		50
Anthracene	78		88		40-140	12		50
Benzo(ghi)perylene	75		82		40-140	9		50
Fluorene	77		87		40-140	12		50
Phenanthrene	76		86		40-140	12		50
Dibenzo(a,h)anthracene	76		86		40-140	12		50
Indeno(1,2,3-cd)pyrene	77		86		40-140	11		50
Pyrene	78		86		35-142	10		50
Biphenyl	80		92		54-104	14		50
4-Chloroaniline	**38**	Q	121		40-140	**104**	Q	50
2-Nitroaniline	88		101		47-134	14		50

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 Batch: WG1075347-2 WG1075347-3								
3-Nitroaniline	60		67		26-129	11		50
4-Nitroaniline	78		88		41-125	12		50
Dibenzofuran	77		88		40-140	13		50
2-Methylnaphthalene	75		86		40-140	14		50
1,2,4,5-Tetrachlorobenzene	82		93		40-117	13		50
Acetophenone	79		87		14-144	10		50
2,4,6-Trichlorophenol	82		95		30-130	15		50
p-Chloro-m-cresol	84		96		26-103	13		50
2-Chlorophenol	76		84		25-102	10		50
2,4-Dichlorophenol	80		90		30-130	12		50
2,4-Dimethylphenol	82		93		30-130	13		50
2-Nitrophenol	88		96		30-130	9		50
4-Nitrophenol	94		105		11-114	11		50
2,4-Dinitrophenol	67		65		4-130	3		50
4,6-Dinitro-o-cresol	84		93		10-130	10		50
Pentachlorophenol	76		82		17-109	8		50
Phenol	72		80		26-90	11		50
2-Methylphenol	75		85		30-130.	13		50
3-Methylphenol/4-Methylphenol	77		87		30-130	12		50
2,4,5-Trichlorophenol	85		97		30-130	13		50
Benzoic Acid	16		15		10-110	6		50
Benzyl Alcohol	83		93		40-140	11		50
Carbazole	78		86		54-128	10		50

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 Batch: WG1075347-2 WG1075347-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	74		79		25-120
Phenol-d6	72		80		10-120
Nitrobenzene-d5	75		82		23-120
2-Fluorobiphenyl	73		83		30-120
2,4,6-Tribromophenol	87		99		10-136
4-Terphenyl-d14	75		83		18-120

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 14-17 Batch: WG1075523-2 WG1075523-3								
Acenaphthene	73		68		31-137	7		50
1,2,4-Trichlorobenzene	80		78		38-107	3		50
Hexachlorobenzene	78		75		40-140	4		50
Bis(2-chloroethyl)ether	80		76		40-140	5		50
2-Chloronaphthalene	89		75		40-140	17		50
1,2-Dichlorobenzene	80		75		40-140	6		50
1,3-Dichlorobenzene	79		73		40-140	8		50
1,4-Dichlorobenzene	77		74		28-104	4		50
3,3'-Dichlorobenzidine	54		53		40-140	2		50
2,4-Dinitrotoluene	81		78		40-132	4		50
2,6-Dinitrotoluene	96		83		40-140	15		50
Fluoranthene	85		82		40-140	4		50
4-Chlorophenyl phenyl ether	75		71		40-140	5		50
4-Bromophenyl phenyl ether	76		74		40-140	3		50
Bis(2-chloroisopropyl)ether	89		83		40-140	7		50
Bis(2-chloroethoxy)methane	78		76		40-117	3		50
Hexachlorobutadiene	80		73		40-140	9		50
Hexachlorocyclopentadiene	88		75		40-140	16		50
Hexachloroethane	74		70		40-140	6		50
Isophorone	78		77		40-140	1		50
Naphthalene	80		74		40-140	8		50
Nitrobenzene	81		75		40-140	8		50
NDPA/DPA	77		74		36-157	4		50

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 14-17 Batch: WG1075523-2 WG1075523-3								
n-Nitrosodi-n-propylamine	80		74		32-121	8		50
Bis(2-ethylhexyl)phthalate	78		75		40-140	4		50
Butyl benzyl phthalate	85		82		40-140	4		50
Di-n-butylphthalate	80		77		40-140	4		50
Di-n-octylphthalate	79		76		40-140	4		50
Diethyl phthalate	76		72		40-140	5		50
Dimethyl phthalate	92		80		40-140	14		50
Benzo(a)anthracene	80		77		40-140	4		50
Benzo(a)pyrene	83		79		40-140	5		50
Benzo(b)fluoranthene	82		77		40-140	6		50
Benzo(k)fluoranthene	83		80		40-140	4		50
Chrysene	82		77		40-140	6		50
Acenaphthylene	91		77		40-140	17		50
Anthracene	81		77		40-140	5		50
Benzo(ghi)perylene	84		80		40-140	5		50
Fluorene	75		72		40-140	4		50
Phenanthrene	78		75		40-140	4		50
Dibenzo(a,h)anthracene	85		81		40-140	5		50
Indeno(1,2,3-cd)pyrene	89		80		40-140	11		50
Pyrene	85		82		35-142	4		50
Biphenyl	93		80		54-104	15		50
4-Chloroaniline	54		48		40-140	12		50
2-Nitroaniline	96		82		47-134	16		50

Lab Control Sample Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 14-17 Batch: WG1075523-2 WG1075523-3								
3-Nitroaniline	66		60		26-129	10		50
4-Nitroaniline	78		75		41-125	4		50
Dibenzofuran	74		70		40-140	6		50
2-Methylnaphthalene	86		73		40-140	16		50
1,2,4,5-Tetrachlorobenzene	94		80		40-117	16		50
Acetophenone	86		79		14-144	8		50
2,4,6-Trichlorophenol	99		85		30-130	15		50
p-Chloro-m-cresol	88		80		26-103	10		50
2-Chlorophenol	84		78		25-102	7		50
2,4-Dichlorophenol	86		84		30-130	2		50
2,4-Dimethylphenol	78		79		30-130	1		50
2-Nitrophenol	86		83		30-130	4		50
4-Nitrophenol	89		88		11-114	1		50
2,4-Dinitrophenol	42		53		4-130	23		50
4,6-Dinitro-o-cresol	78		77		10-130	1		50
Pentachlorophenol	94		94		17-109	0		50
Phenol	80		75		26-90	6		50
2-Methylphenol	84		77		30-130.	9		50
3-Methylphenol/4-Methylphenol	86		80		30-130	7		50
2,4,5-Trichlorophenol	100		88		30-130	13		50
Benzoic Acid	**0**	Q	**0**	Q	10-110	NC		50
Benzyl Alcohol	88		81		40-140	8		50
Carbazole	82		79		54-128	4		50

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 14-17 Batch: WG1075523-2 WG1075523-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	82		80		25-120
Phenol-d6	78		75		10-120
Nitrobenzene-d5	77		75		23-120
2-Fluorobiphenyl	83		74		30-120
2,4,6-Tribromophenol	81		80		10-136
4-Terphenyl-d14	80		80		18-120

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1746315

Project Number: BBU1702 ***Report Date:*** 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 QC Batch ID: WG1075347-4 WG1075347-5 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
Acenaphthene	62.J	1510	1300	86		1800	120		31-137	32		50
1,2,4-Trichlorobenzene	ND	1510	1300	86		1700	**110**	Q	38-107	27		50
Hexachlorobenzene	ND	1510	1200	80		1600	110		40-140	29		50
Bis(2-chloroethyl)ether	ND	1510	1300	86		1600	110		40-140	21		50
2-Chloronaphthalene	ND	1510	1300	86		1700	110		40-140	27		50
1,2-Dichlorobenzene	ND	1510	1300	86		1600	110		40-140	21		50
1,3-Dichlorobenzene	ND	1510	1300	86		1600	110		40-140	21		50
1,4-Dichlorobenzene	ND	1510	1300	86		1600	**110**	Q	28-104	21		50
3,3'-Dichlorobenzidine	ND	1510	590	**39**	Q	900	60		40-140	42		50
2,4-Dinitrotoluene	ND	1510	1600	110		2000	130		40-132	22		50
2,6-Dinitrotoluene	ND	1510	1500	100		1900	130		40-140	24		50
Fluoranthene	1600	1510	3500	130		5200	**240**	Q	40-140	39		50
4-Chlorophenyl phenyl ether	ND	1510	1200	80		1600	110		40-140	29		50
4-Bromophenyl phenyl ether	ND	1510	1200	80		1700	110		40-140	34		50
Bis(2-chloroisopropyl)ether	ND	1510	1200	80		1500	100		40-140	22		50
Bis(2-chloroethoxy)methane	ND	1510	1300	86		1700	110		40-117	27		50
Hexachlorobutadiene	ND	1510	1400	93		1700	110		40-140	19		50
Hexachlorocyclopentadiene	ND	1510	590	**39**	Q	680	46		40-140	14		50
Hexachloroethane	ND	1510	1300	86		1600	110		40-140	21		50
Isophorone	ND	1510	1300	86		1700	110		40-140	27		50
Naphthalene	83.J	1510	1400	93		1800	120		40-140	25		50
Nitrobenzene	ND	1510	1400	93		1800	120		40-140	25		50
NDPA/DPA	ND	1510	1300	86		1800	120		36-157	32		50

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1746315

Project Number: BBU1702 ***Report Date:*** 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 QC Batch ID: WG1075347-4 WG1075347-5 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
n-Nitrosodi-n-propylamine	ND	1510	1400	93		1700	110		32-121	19		50
Bis(2-ethylhexyl)phthalate	ND	1510	1200	80		1600	110		40-140	29		50
Butyl benzyl phthalate	ND	1510	1200	80		1700	110		40-140	34		50
Di-n-butylphthalate	ND	1510	1200	80		1600	110		40-140	29		50
Di-n-octylphthalate	ND	1510	1200	80		1600	110		40-140	29		50
Diethyl phthalate	ND	1510	1300	86		1800	120		40-140	32		50
Dimethyl phthalate	ND	1510	1400	93		1800	120		40-140	25		50
Benzo(a)anthracene	850	1510	2200	90		3300	**160**	Q	40-140	40		50
Benzo(a)pyrene	800	1510	2100	86		3100	**150**	Q	40-140	38		50
Benzo(b)fluoranthene	1000	1510	2400	93		3500	**170**	Q	40-140	37		50
Benzo(k)fluoranthene	370	1510	1600	82		2200	120		40-140	32		50
Chrysene	890	1510	2200	87		3300	**160**	Q	40-140	40		50
Acenaphthylene	78.J	1510	1400	93		1800	120		40-140	25		50
Anthracene	180	1510	1500	88		2000	120		40-140	29		50
Benzo(ghi)perylene	500	1510	1600	73		2200	110		40-140	32		50
Fluorene	71.J	1510	1300	86		1800	120		40-140	32		50
Phenanthrene	850	1510	2500	110		3700	**190**	Q	40-140	39		50
Dibenzo(a,h)anthracene	140	1510	1100	64		1600	98		40-140	37		50
Indeno(1,2,3-cd)pyrene	540	1510	1700	77		2400	120		40-140	34		50
Pyrene	1400	1510	3200	120		4700	**220**	Q	35-142	38		50
Biphenyl	ND	1510	1400	93		1800	**120**	Q	54-104	25		50
4-Chloroaniline	ND	1510	620	41		800	54		40-140	25		50
2-Nitroaniline	ND	1510	1600	110		2000	130		47-134	22		50

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 QC Batch ID: WG1075347-4 WG1075347-5 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
3-Nitroaniline	ND	1510	960	64		1500	100		26-129	44		50
4-Nitroaniline	ND	1510	1100	73		1600	110		41-125	37		50
Dibenzofuran	36.J	1510	1300	86		1800	120		40-140	32		50
2-Methylnaphthalene	84.J	1510	1400	93		1800	120		40-140	25		50
1,2,4,5-Tetrachlorobenzene	ND	1510	1400	93		1800	**120**	Q	40-117	25		50
Acetophenone	ND	1510	1500	100		1900	130		14-144	24		50
2,4,6-Trichlorophenol	ND	1510	1000	66		1000	67		30-130	0		50
p-Chloro-m-cresol	ND	1510	1500	100		1900	**130**	Q	26-103	24		50
2-Chlorophenol	ND	1510	1300	86		1500	100		25-102	14		50
2,4-Dichlorophenol	ND	1510	1300	86		1600	110		30-130	21		50
2,4-Dimethylphenol	ND	1510	1500	100		1900	130		30-130	24		50
2-Nitrophenol	ND	1510	1300	86		1400	94		30-130	7		50
4-Nitrophenol	ND	1510	640	42		540	36		11-114	17		50
2,4-Dinitrophenol	ND	1510	ND	**0**	Q	ND	**0**	Q	4-130	NC		50
4,6-Dinitro-o-cresol	ND	1510	180J	12		ND	**0**	Q	10-130	NC		50
Pentachlorophenol	ND	1510	300	20		240	**16**	Q	17-109	22		50
Phenol	ND	1510	1300	86		1600	**110**	Q	26-90	21		50
2-Methylphenol	ND	1510	1400	93		1700	110		30-130.	19		50
3-Methylphenol/4-Methylphenol	ND	1510	1400	93		1800	120		30-130	25		50
2,4,5-Trichlorophenol	ND	1510	1200	80		1400	94		30-130	15		50
Benzoic Acid	ND	1510	ND	**0**	Q	ND	**0**	Q	10-110	NC		50
Benzyl Alcohol	ND	1510	1500	100		2000	130		40-140	29		50
Carbazole	91.J	1510	1400	93		1900	**130**	Q	54-128	30		50

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1746315

Project Number: BBU1702 ***Report Date:*** 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*

Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-13 QC Batch ID: WG1075347-4 WG1075347-5 QC Sample: L1746315-03 Client ID: SB006 (0-2)

Surrogate	*MS % Recovery*	*MS Qualifier*	*MSD % Recovery*	*MSD Qualifier*	*Acceptance Criteria*
2,4,6-Tribromophenol	78		84		10-136
2-Fluorobiphenyl	78		103		30-120
2-Fluorophenol	77		83		25-120
4-Terphenyl-d14	65		91		18-120
Nitrobenzene-d5	92		119		23-120
Phenol-d6	85		107		10-120

PCBS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01
Client ID: SB005 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 20:29
Analyst: JW
Percent Solids: 88%

Date Collected: 12/14/17 09:30
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	37.1	4.21	1	A
Aroclor 1221	ND		ug/kg	37.1	5.65	1	A
Aroclor 1232	ND		ug/kg	37.1	3.65	1	A
Aroclor 1242	ND		ug/kg	37.1	4.54	1	A
Aroclor 1248	ND		ug/kg	37.1	4.16	1	A
Aroclor 1254	ND		ug/kg	37.1	3.03	1	A
Aroclor 1260	19.1	J	ug/kg	37.1	3.87	1	B
Aroclor 1262	ND		ug/kg	37.1	3.05	1	A
Aroclor 1268	8.86	J	ug/kg	37.1	2.63	1	B
PCBs, Total	28.0	J	ug/kg	37.1	2.63	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	94		30-150	A
Decachlorobiphenyl	112		30-150	A
2,4,5,6-Tetrachloro-m-xylene	89		30-150	B
Decachlorobiphenyl	125		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02
Client ID: SB005 (3-5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 20:44
Analyst: JW
Percent Solids: 84%

Date Collected: 12/14/17 09:35
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	38.1	4.32	1	A
Aroclor 1221	ND		ug/kg	38.1	5.80	1	A
Aroclor 1232	ND		ug/kg	38.1	3.75	1	A
Aroclor 1242	ND		ug/kg	38.1	4.66	1	A
Aroclor 1248	ND		ug/kg	38.1	4.27	1	A
Aroclor 1254	ND		ug/kg	38.1	3.11	1	A
Aroclor 1260	ND		ug/kg	38.1	3.98	1	A
Aroclor 1262	ND		ug/kg	38.1	3.13	1	A
Aroclor 1268	ND		ug/kg	38.1	2.70	1	A
PCBs, Total	ND		ug/kg	38.1	2.70	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	90		30-150	A
Decachlorobiphenyl	93		30-150	A
2,4,5,6-Tetrachloro-m-xylene	89		30-150	B
Decachlorobiphenyl	92		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03
Client ID: SB006 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 14:18
Analyst: AWS
Percent Solids: 87%

Date Collected: 12/14/17 09:45
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.6	4.15	1	A
Aroclor 1221	ND		ug/kg	36.6	5.57	1	A
Aroclor 1232	ND		ug/kg	36.6	3.60	1	A
Aroclor 1242	28.9	J	ug/kg	36.6	4.48	1	B
Aroclor 1248	ND		ug/kg	36.6	4.10	1	A
Aroclor 1254	26.6	J	ug/kg	36.6	2.98	1	A
Aroclor 1260	21.3	J	ug/kg	36.6	3.82	1	B
Aroclor 1262	ND		ug/kg	36.6	3.01	1	A
Aroclor 1268	8.61	J	ug/kg	36.6	2.59	1	B
PCBs, Total	85.4	J	ug/kg	36.6	2.59	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	84		30-150	A
Decachlorobiphenyl	64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		30-150	B
Decachlorobiphenyl	76		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04
Client ID: SB006 (7.5-9.5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 21:00
Analyst: JW
Percent Solids: 88%

Date Collected: 12/14/17 09:50
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.8	4.18	1	A
Aroclor 1221	ND		ug/kg	36.8	5.60	1	A
Aroclor 1232	ND		ug/kg	36.8	3.62	1	A
Aroclor 1242	ND		ug/kg	36.8	4.51	1	A
Aroclor 1248	ND		ug/kg	36.8	4.13	1	A
Aroclor 1254	ND		ug/kg	36.8	3.00	1	A
Aroclor 1260	ND		ug/kg	36.8	3.84	1	A
Aroclor 1262	ND		ug/kg	36.8	3.03	1	A
Aroclor 1268	ND		ug/kg	36.8	2.61	1	A
PCBs, Total	ND		ug/kg	36.8	2.61	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	93		30-150	A
Decachlorobiphenyl	99		30-150	A
2,4,5,6-Tetrachloro-m-xylene	92		30-150	B
Decachlorobiphenyl	97		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05
Client ID: SB007 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 21:16
Analyst: JW
Percent Solids: 86%

Date Collected: 12/14/17 10:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.6	4.15	1	A
Aroclor 1221	ND		ug/kg	36.6	5.57	1	A
Aroclor 1232	ND		ug/kg	36.6	3.60	1	A
Aroclor 1242	ND		ug/kg	36.6	4.48	1	A
Aroclor 1248	35.9	J	ug/kg	36.6	4.11	1	A
Aroclor 1254	41.6	P	ug/kg	36.6	2.99	1	B
Aroclor 1260	30.0	J	ug/kg	36.6	3.82	1	B
Aroclor 1262	ND		ug/kg	36.6	3.01	1	A
Aroclor 1268	12.4	J	ug/kg	36.6	2.59	1	B
PCBs, Total	120	J	ug/kg	36.6	2.59	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	95		30-150	A
Decachlorobiphenyl	110		30-150	A
2,4,5,6-Tetrachloro-m-xylene	88		30-150	B
Decachlorobiphenyl	120		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06
Client ID: SB007 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 21:32
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 10:05
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.6	4.16	1	A
Aroclor 1221	ND		ug/kg	36.6	5.58	1	A
Aroclor 1232	ND		ug/kg	36.6	3.60	1	A
Aroclor 1242	ND		ug/kg	36.6	4.48	1	A
Aroclor 1248	ND		ug/kg	36.6	4.11	1	A
Aroclor 1254	ND		ug/kg	36.6	2.99	1	A
Aroclor 1260	ND		ug/kg	36.6	3.82	1	A
Aroclor 1262	ND		ug/kg	36.6	3.01	1	A
Aroclor 1268	ND		ug/kg	36.6	2.59	1	A
PCBs, Total	ND		ug/kg	36.6	2.59	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	102		30-150	A
Decachlorobiphenyl	107		30-150	A
2,4,5,6-Tetrachloro-m-xylene	100		30-150	B
Decachlorobiphenyl	108		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07
Client ID: SB008 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 21:48
Analyst: JW
Percent Solids: 91%

Date Collected: 12/14/17 10:25
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.8	4.05	1	A
Aroclor 1221	ND		ug/kg	35.8	5.44	1	A
Aroclor 1232	ND		ug/kg	35.8	3.52	1	A
Aroclor 1242	ND		ug/kg	35.8	4.38	1	A
Aroclor 1248	51.1		ug/kg	35.8	4.01	1	B
Aroclor 1254	75.9		ug/kg	35.8	2.92	1	B
Aroclor 1260	42.5		ug/kg	35.8	3.73	1	B
Aroclor 1262	ND		ug/kg	35.8	2.94	1	A
Aroclor 1268	15.6	J	ug/kg	35.8	2.53	1	A
PCBs, Total	185	J	ug/kg	35.8	2.53	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	82		30-150	A
Decachlorobiphenyl	98		30-150	A
2,4,5,6-Tetrachloro-m-xylene	79		30-150	B
Decachlorobiphenyl	103		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08
Client ID: SB008 (10-12)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 22:04
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 10:30
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.5	4.03	1	A
Aroclor 1221	ND		ug/kg	35.5	5.41	1	A
Aroclor 1232	ND		ug/kg	35.5	3.50	1	A
Aroclor 1242	ND		ug/kg	35.5	4.35	1	A
Aroclor 1248	ND		ug/kg	35.5	3.98	1	A
Aroclor 1254	ND		ug/kg	35.5	2.90	1	A
Aroclor 1260	ND		ug/kg	35.5	3.71	1	A
Aroclor 1262	ND		ug/kg	35.5	2.92	1	A
Aroclor 1268	ND		ug/kg	35.5	2.52	1	A
PCBs, Total	ND		ug/kg	35.5	2.52	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	90		30-150	A
Decachlorobiphenyl	93		30-150	A
2,4,5,6-Tetrachloro-m-xylene	91		30-150	B
Decachlorobiphenyl	97		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09
Client ID: SB009 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 22:20
Analyst: JW
Percent Solids: 86%

Date Collected: 12/14/17 10:50
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.7	4.16	1	A
Aroclor 1221	ND		ug/kg	36.7	5.58	1	A
Aroclor 1232	ND		ug/kg	36.7	3.61	1	A
Aroclor 1242	ND		ug/kg	36.7	4.49	1	A
Aroclor 1248	ND		ug/kg	36.7	4.11	1	A
Aroclor 1254	ND		ug/kg	36.7	2.99	1	A
Aroclor 1260	68.2		ug/kg	36.7	3.83	1	B
Aroclor 1262	ND		ug/kg	36.7	3.01	1	A
Aroclor 1268	ND		ug/kg	36.7	2.60	1	A
PCBs, Total	68.2		ug/kg	36.7	2.60	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	88		30-150	A
Decachlorobiphenyl	98		30-150	A
2,4,5,6-Tetrachloro-m-xylene	83		30-150	B
Decachlorobiphenyl	101		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10
Client ID: SB009 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 22:36
Analyst: JW
Percent Solids: 88%

Date Collected: 12/14/17 10:55
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.9	4.18	1	A
Aroclor 1221	ND		ug/kg	36.9	5.61	1	A
Aroclor 1232	ND		ug/kg	36.9	3.63	1	A
Aroclor 1242	ND		ug/kg	36.9	4.51	1	A
Aroclor 1248	ND		ug/kg	36.9	4.14	1	A
Aroclor 1254	ND		ug/kg	36.9	3.01	1	A
Aroclor 1260	ND		ug/kg	36.9	3.85	1	A
Aroclor 1262	ND		ug/kg	36.9	3.03	1	A
Aroclor 1268	ND		ug/kg	36.9	2.61	1	A
PCBs, Total	ND		ug/kg	36.9	2.61	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	95		30-150	A
Decachlorobiphenyl	102		30-150	A
2,4,5,6-Tetrachloro-m-xylene	95		30-150	B
Decachlorobiphenyl	103		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11
Client ID: SB010 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 22:52
Analyst: JW
Percent Solids: 80%

Date Collected: 12/14/17 11:05
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	40.6	4.60	1	A
Aroclor 1221	ND		ug/kg	40.6	6.18	1	A
Aroclor 1232	ND		ug/kg	40.6	3.99	1	A
Aroclor 1242	ND		ug/kg	40.6	4.97	1	A
Aroclor 1248	ND		ug/kg	40.6	4.55	1	A
Aroclor 1254	ND		ug/kg	40.6	3.31	1	A
Aroclor 1260	39.6	J	ug/kg	40.6	4.24	1	B
Aroclor 1262	ND		ug/kg	40.6	3.34	1	A
Aroclor 1268	17.3	J	ug/kg	40.6	2.87	1	A
PCBs, Total	56.9	J	ug/kg	40.6	2.87	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	102		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		30-150	B
Decachlorobiphenyl	115		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12
Client ID: SB010 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 23:08
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 11:10
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.7	4.05	1	A
Aroclor 1221	ND		ug/kg	35.7	5.44	1	A
Aroclor 1232	ND		ug/kg	35.7	3.52	1	A
Aroclor 1242	ND		ug/kg	35.7	4.37	1	A
Aroclor 1248	ND		ug/kg	35.7	4.01	1	A
Aroclor 1254	ND		ug/kg	35.7	2.92	1	A
Aroclor 1260	ND		ug/kg	35.7	3.73	1	A
Aroclor 1262	ND		ug/kg	35.7	2.94	1	A
Aroclor 1268	ND		ug/kg	35.7	2.53	1	A
PCBs, Total	ND		ug/kg	35.7	2.53	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	99		30-150	A
Decachlorobiphenyl	100		30-150	A
2,4,5,6-Tetrachloro-m-xylene	97		30-150	B
Decachlorobiphenyl	104		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13
Client ID: SB011 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/22/17 23:24
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 11:20
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.5	4.02	1	A
Aroclor 1221	ND		ug/kg	35.5	5.40	1	A
Aroclor 1232	ND		ug/kg	35.5	3.49	1	A
Aroclor 1242	ND		ug/kg	35.5	4.34	1	A
Aroclor 1248	ND		ug/kg	35.5	3.98	1	A
Aroclor 1254	ND		ug/kg	35.5	2.90	1	A
Aroclor 1260	ND		ug/kg	35.5	3.70	1	A
Aroclor 1262	ND		ug/kg	35.5	2.92	1	A
Aroclor 1268	ND		ug/kg	35.5	2.51	1	A
PCBs, Total	ND		ug/kg	35.5	2.51	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	91		30-150	A
Decachlorobiphenyl	106		30-150	A
2,4,5,6-Tetrachloro-m-xylene	91		30-150	B
Decachlorobiphenyl	123		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14
Client ID: SB011 (5-7)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/24/17 15:41
Analyst: JW
Percent Solids: 92%

Date Collected: 12/14/17 11:25
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 21:39
Cleanup Method: EPA 3665A
Cleanup Date: 12/22/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.5	4.03	1	A
Aroclor 1221	ND		ug/kg	35.5	5.41	1	A
Aroclor 1232	ND		ug/kg	35.5	3.50	1	A
Aroclor 1242	ND		ug/kg	35.5	4.35	1	A
Aroclor 1248	ND		ug/kg	35.5	3.99	1	A
Aroclor 1254	ND		ug/kg	35.5	2.90	1	A
Aroclor 1260	ND		ug/kg	35.5	3.71	1	A
Aroclor 1262	ND		ug/kg	35.5	2.92	1	A
Aroclor 1268	ND		ug/kg	35.5	2.52	1	A
PCBs, Total	ND		ug/kg	35.5	2.52	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	84		30-150	A
Decachlorobiphenyl	64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	82		30-150	B
Decachlorobiphenyl	77		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15
Client ID: SB012 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/26/17 06:18
Analyst: TQ
Percent Solids: 88%

Date Collected: 12/14/17 11:40
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 21:39
Cleanup Method: EPA 3665A
Cleanup Date: 12/22/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.6	4.15	1	A
Aroclor 1221	ND		ug/kg	36.6	5.58	1	A
Aroclor 1232	ND		ug/kg	36.6	3.60	1	A
Aroclor 1242	ND		ug/kg	36.6	4.48	1	A
Aroclor 1248	ND		ug/kg	36.6	4.11	1	A
Aroclor 1254	ND		ug/kg	36.6	2.99	1	A
Aroclor 1260	27.7	J	ug/kg	36.6	3.82	1	A
Aroclor 1262	ND		ug/kg	36.6	3.01	1	A
Aroclor 1268	7.53	J	ug/kg	36.6	2.59	1	A
PCBs, Total	35.2	J	ug/kg	36.6	2.59	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	99		30-150	A
Decachlorobiphenyl	71		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	56		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16
Client ID: SB012 (6-8)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/26/17 05:20
Analyst: JW
Percent Solids: 92%

Date Collected: 12/14/17 11:45
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 21:39
Cleanup Method: EPA 3665A
Cleanup Date: 12/22/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	35.5	4.03	1	A
Aroclor 1221	ND		ug/kg	35.5	5.40	1	A
Aroclor 1232	ND		ug/kg	35.5	3.49	1	A
Aroclor 1242	ND		ug/kg	35.5	4.34	1	A
Aroclor 1248	ND		ug/kg	35.5	3.98	1	A
Aroclor 1254	ND		ug/kg	35.5	2.90	1	A
Aroclor 1260	ND		ug/kg	35.5	3.71	1	A
Aroclor 1262	ND		ug/kg	35.5	2.92	1	A
Aroclor 1268	ND		ug/kg	35.5	2.51	1	A
PCBs, Total	ND		ug/kg	35.5	2.51	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	70		30-150	A
2,4,5,6-Tetrachloro-m-xylene	84		30-150	B
Decachlorobiphenyl	74		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17
Client ID: DUP002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8082A
Analytical Date: 12/26/17 05:35
Analyst: TQ
Percent Solids: 87%

Date Collected: 12/14/17 00:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 21:39
Cleanup Method: EPA 3665A
Cleanup Date: 12/22/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.4	4.13	1	A
Aroclor 1221	ND		ug/kg	36.4	5.54	1	A
Aroclor 1232	ND		ug/kg	36.4	3.58	1	A
Aroclor 1242	ND		ug/kg	36.4	4.46	1	A
Aroclor 1248	28.1	J	ug/kg	36.4	4.09	1	B
Aroclor 1254	27.7	J	ug/kg	36.4	2.97	1	A
Aroclor 1260	20.3	J	ug/kg	36.4	3.80	1	A
Aroclor 1262	ND		ug/kg	36.4	2.99	1	A
Aroclor 1268	12.0	J	ug/kg	36.4	2.58	1	A
PCBs, Total	88.1	J	ug/kg	36.4	2.58	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	88		30-150	A
Decachlorobiphenyl	90		30-150	A
2,4,5,6-Tetrachloro-m-xylene	83		30-150	B
Decachlorobiphenyl	85		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18
Client ID: FIELDBLANK002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Water
Analytical Method: 1,8082A
Analytical Date: 12/21/17 14:54
Analyst: HT

Date Collected: 12/14/17 12:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 12/19/17 17:24
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/21/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Polychlorinated Biphenyls by GC - Westborough Lab							
Aroclor 1016	ND		ug/l	0.083	0.020	1	A
Aroclor 1221	ND		ug/l	0.083	0.032	1	A
Aroclor 1232	ND		ug/l	0.083	0.027	1	A
Aroclor 1242	ND		ug/l	0.083	0.030	1	A
Aroclor 1248	ND		ug/l	0.083	0.023	1	A
Aroclor 1254	ND		ug/l	0.083	0.035	1	A
Aroclor 1260	0.039	J	ug/l	0.083	0.020	1	A
Aroclor 1262	ND		ug/l	0.083	0.017	1	A
Aroclor 1268	ND		ug/l	0.083	0.027	1	A
PCBs, Total	0.039	J	ug/l	0.083	0.017	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		30-150	A
Decachlorobiphenyl	60		30-150	A
2,4,5,6-Tetrachloro-m-xylene	71		30-150	B
Decachlorobiphenyl	71		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 12/20/17 14:33
Analyst: WR

Extraction Method: EPA 3510C
Extraction Date: 12/19/17 17:24
Cleanup Method: EPA 3665A
Cleanup Date: 12/20/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/20/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 18 Batch: WG1074537-1						
Aroclor 1016	ND		ug/l	0.083	0.020	A
Aroclor 1221	ND		ug/l	0.083	0.032	A
Aroclor 1232	ND		ug/l	0.083	0.027	A
Aroclor 1242	ND		ug/l	0.083	0.030	A
Aroclor 1248	ND		ug/l	0.083	0.023	A
Aroclor 1254	ND		ug/l	0.083	0.035	A
Aroclor 1262	ND		ug/l	0.083	0.017	A
Aroclor 1268	ND		ug/l	0.083	0.027	A
Aroclor 1260	0.063	J	ug/l	0.083	0.020	B
PCBs, Total	0.063	J	ug/l	0.083	0.017	B

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	50		30-150	A
2,4,5,6-Tetrachloro-m-xylene	70		30-150	B
Decachlorobiphenyl	65		30-150	B

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 12/22/17 15:46
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 12/21/17 08:36
Cleanup Method: EPA 3665A
Cleanup Date: 12/21/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 01-13 Batch: WG1075307-1						
Aroclor 1016	ND		ug/kg	32.0	3.63	A
Aroclor 1221	ND		ug/kg	32.0	4.87	A
Aroclor 1232	ND		ug/kg	32.0	3.15	A
Aroclor 1242	ND		ug/kg	32.0	3.92	A
Aroclor 1248	ND		ug/kg	32.0	3.59	A
Aroclor 1254	ND		ug/kg	32.0	2.61	A
Aroclor 1260	ND		ug/kg	32.0	3.34	A
Aroclor 1262	ND		ug/kg	32.0	2.63	A
Aroclor 1268	ND		ug/kg	32.0	2.26	A
PCBs, Total	ND		ug/kg	32.0	2.26	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	78		30-150	A
2,4,5,6-Tetrachloro-m-xylene	85		30-150	B
Decachlorobiphenyl	80		30-150	B

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8082A
Analytical Date: 12/24/17 15:55
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 12/21/17 21:39
Cleanup Method: EPA 3665A
Cleanup Date: 12/22/17
Cleanup Method: EPA 3660B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Polychlorinated Biphenyls by GC - Westborough Lab for sample(s): 14-17 Batch: WG1075629-1						
Aroclor 1016	ND		ug/kg	32.0	3.63	A
Aroclor 1221	ND		ug/kg	32.0	4.87	A
Aroclor 1232	ND		ug/kg	32.0	3.15	A
Aroclor 1242	ND		ug/kg	32.0	3.92	A
Aroclor 1248	ND		ug/kg	32.0	3.59	A
Aroclor 1254	ND		ug/kg	32.0	2.61	A
Aroclor 1260	ND		ug/kg	32.0	3.34	A
Aroclor 1262	ND		ug/kg	32.0	2.63	A
Aroclor 1268	ND		ug/kg	32.0	2.27	A
PCBs, Total	ND		ug/kg	32.0	2.27	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	90		30-150	A
Decachlorobiphenyl	82		30-150	A
2,4,5,6-Tetrachloro-m-xylene	92		30-150	B
Decachlorobiphenyl	88		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 18 Batch: WG1074537-2 WG1074537-3									
Aroclor 1016	89		80		40-140	11		50	A
Aroclor 1260	83		79		40-140	4		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	87		81		30-150	A
Decachlorobiphenyl	67		92		30-150	A
2,4,5,6-Tetrachloro-m-xylene	81		76		30-150	B
Decachlorobiphenyl	68		89		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-13 Batch: WG1075307-2 WG1075307-3									
Aroclor 1016	85		86		40-140	1		50	A
Aroclor 1260	99		88		40-140	12		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	98		99		30-150	A
Decachlorobiphenyl	103		103		30-150	A
2,4,5,6-Tetrachloro-m-xylene	93		96		30-150	B
Decachlorobiphenyl	99		101		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 14-17 Batch: WG1075629-2 WG1075629-3									
Aroclor 1016	85		76		40-140	11		50	A
Aroclor 1260	80		74		40-140	8		50	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	89		80		30-150	A
Decachlorobiphenyl	74		71		30-150	A
2,4,5,6-Tetrachloro-m-xylene	90		78		30-150	B
Decachlorobiphenyl	86		79		30-150	B

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*	*Column*
Polychlorinated Biphenyls by GC - Westborough Lab Associated sample(s): 01-13 QC Batch ID: WG1075307-4 WG1075307-5 QC Sample: L1746315-03 Client ID: SB006 (0-2)													
Aroclor 1016	ND	231	173	75		172	72		40-140	1		50	A
Aroclor 1260	21.3J	231	175	76		178	75		40-140	2		50	B

Surrogate	*MS % Recovery*	*MS Qualifier*	*MSD % Recovery*	*MSD Qualifier*	*Acceptance Criteria*	*Column*
2,4,5,6-Tetrachloro-m-xylene	81		75		30-150	A
Decachlorobiphenyl	66		64		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		68		30-150	B
Decachlorobiphenyl	84		82		30-150	B

PESTICIDES

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01
Client ID: SB005 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 16:42
Analyst: JW
Percent Solids: 88%

Date Collected: 12/14/17 09:30
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.74	0.341	1	A
Lindane	ND		ug/kg	0.726	0.324	1	A
Alpha-BHC	ND		ug/kg	0.726	0.206	1	A
Beta-BHC	ND		ug/kg	1.74	0.660	1	A
Heptachlor	ND		ug/kg	0.871	0.390	1	A
Aldrin	ND		ug/kg	1.74	0.613	1	A
Heptachlor epoxide	ND		ug/kg	3.26	0.980	1	A
Endrin	ND		ug/kg	0.726	0.298	1	A
Endrin aldehyde	ND		ug/kg	2.18	0.762	1	A
Endrin ketone	ND		ug/kg	1.74	0.448	1	A
Dieldrin	ND		ug/kg	1.09	0.544	1	A
4,4'-DDE	9.75		ug/kg	1.74	0.403	1	A
4,4'-DDD	24.6		ug/kg	1.74	0.621	1	B
4,4'-DDT	12.7	P	ug/kg	3.26	1.40	1	A
Endosulfan I	ND		ug/kg	1.74	0.411	1	A
Endosulfan II	ND		ug/kg	1.74	0.582	1	A
Endosulfan sulfate	ND		ug/kg	0.726	0.345	1	A
Methoxychlor	ND		ug/kg	3.26	1.02	1	A
Toxaphene	ND		ug/kg	32.6	9.14	1	A
cis-Chlordane	27.9		ug/kg	2.18	0.607	1	A
trans-Chlordane	21.8	PI	ug/kg	2.18	0.575	1	A
Chlordane	128		ug/kg	14.2	5.77	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	78		30-150	B
Decachlorobiphenyl	**164**	Q	30-150	B
2,4,5,6-Tetrachloro-m-xylene	93		30-150	A
Decachlorobiphenyl	149		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02
Client ID: SB005 (3-5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 16:54
Analyst: JW
Percent Solids: 84%

Date Collected: 12/14/17 09:35
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.81	0.354	1	A
Lindane	ND		ug/kg	0.754	0.337	1	A
Alpha-BHC	ND		ug/kg	0.754	0.214	1	A
Beta-BHC	ND		ug/kg	1.81	0.686	1	A
Heptachlor	ND		ug/kg	0.904	0.406	1	A
Aldrin	ND		ug/kg	1.81	0.637	1	A
Heptachlor epoxide	ND		ug/kg	3.39	1.02	1	A
Endrin	ND		ug/kg	0.754	0.309	1	A
Endrin aldehyde	ND		ug/kg	2.26	0.792	1	A
Endrin ketone	ND		ug/kg	1.81	0.466	1	A
Dieldrin	ND		ug/kg	1.13	0.565	1	A
4,4'-DDE	ND		ug/kg	1.81	0.418	1	A
4,4'-DDD	ND		ug/kg	1.81	0.645	1	A
4,4'-DDT	ND		ug/kg	3.39	1.45	1	A
Endosulfan I	ND		ug/kg	1.81	0.427	1	A
Endosulfan II	ND		ug/kg	1.81	0.604	1	A
Endosulfan sulfate	ND		ug/kg	0.754	0.359	1	A
Methoxychlor	ND		ug/kg	3.39	1.06	1	A
Toxaphene	ND		ug/kg	33.9	9.50	1	A
cis-Chlordane	ND		ug/kg	2.26	0.630	1	A
trans-Chlordane	ND		ug/kg	2.26	0.597	1	A
Chlordane	ND		ug/kg	14.7	5.99	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	84		30-150	B
Decachlorobiphenyl	82		30-150	B
2,4,5,6-Tetrachloro-m-xylene	82		30-150	A
Decachlorobiphenyl	71		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03
Client ID: SB006 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/26/17 14:26
Analyst: CD
Percent Solids: 87%

Date Collected: 12/14/17 09:45
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	1.56	J	ug/kg	1.81	0.354	1	A
Lindane	ND		ug/kg	0.753	0.337	1	A
Alpha-BHC	ND		ug/kg	0.753	0.214	1	A
Beta-BHC	ND		ug/kg	1.81	0.685	1	A
Heptachlor	ND		ug/kg	0.904	0.405	1	A
Aldrin	ND		ug/kg	1.81	0.636	1	A
Heptachlor epoxide	ND		ug/kg	3.39	1.02	1	A
Endrin	ND		ug/kg	0.753	0.309	1	A
Endrin aldehyde	ND		ug/kg	2.26	0.791	1	A
Endrin ketone	ND		ug/kg	1.81	0.465	1	A
Dieldrin	ND		ug/kg	1.13	0.565	1	A
4,4'-DDE	5.60	P	ug/kg	1.81	0.418	1	A
4,4'-DDD	8.75		ug/kg	1.81	0.645	1	B
4,4'-DDT	ND		ug/kg	3.39	1.45	1	A
Endosulfan I	ND		ug/kg	1.81	0.427	1	A
Endosulfan II	ND		ug/kg	1.81	0.604	1	A
Endosulfan sulfate	ND		ug/kg	0.753	0.358	1	A
Methoxychlor	ND		ug/kg	3.39	1.05	1	A
Toxaphene	ND		ug/kg	33.9	9.49	1	A
cis-Chlordane	1.10	J	ug/kg	2.26	0.630	1	A
trans-Chlordane	0.910	JPI	ug/kg	2.26	0.596	1	B
Chlordane	ND		ug/kg	14.7	5.99	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	133		30-150	B
Decachlorobiphenyl	**174**	Q	30-150	B
2,4,5,6-Tetrachloro-m-xylene	123		30-150	A
Decachlorobiphenyl	**173**	Q	30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04
Client ID: SB006 (7.5-9.5)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:07
Analyst: JW
Percent Solids: 88%

Date Collected: 12/14/17 09:50
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.73	0.339	1	A
Lindane	ND		ug/kg	0.722	0.323	1	A
Alpha-BHC	ND		ug/kg	0.722	0.205	1	A
Beta-BHC	ND		ug/kg	1.73	0.657	1	A
Heptachlor	ND		ug/kg	0.866	0.388	1	A
Aldrin	ND		ug/kg	1.73	0.610	1	A
Heptachlor epoxide	ND		ug/kg	3.25	0.974	1	A
Endrin	ND		ug/kg	0.722	0.296	1	A
Endrin aldehyde	ND		ug/kg	2.16	0.758	1	A
Endrin ketone	ND		ug/kg	1.73	0.446	1	A
Dieldrin	ND		ug/kg	1.08	0.541	1	A
4,4'-DDE	ND		ug/kg	1.73	0.401	1	A
4,4'-DDD	ND		ug/kg	1.73	0.618	1	A
4,4'-DDT	ND		ug/kg	3.25	1.39	1	A
Endosulfan I	ND		ug/kg	1.73	0.409	1	A
Endosulfan II	ND		ug/kg	1.73	0.579	1	A
Endosulfan sulfate	ND		ug/kg	0.722	0.344	1	A
Methoxychlor	ND		ug/kg	3.25	1.01	1	A
Toxaphene	ND		ug/kg	32.5	9.10	1	A
cis-Chlordane	ND		ug/kg	2.16	0.604	1	A
trans-Chlordane	ND		ug/kg	2.16	0.572	1	A
Chlordane	ND		ug/kg	14.1	5.74	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	87		30-150	B
Decachlorobiphenyl	92		30-150	B
2,4,5,6-Tetrachloro-m-xylene	91		30-150	A
Decachlorobiphenyl	80		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05
Client ID: SB007 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:19
Analyst: JW
Percent Solids: 86%

Date Collected: 12/14/17 10:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.84	0.361	1	A
Lindane	ND		ug/kg	0.768	0.343	1	A
Alpha-BHC	ND		ug/kg	0.768	0.218	1	A
Beta-BHC	ND		ug/kg	1.84	0.699	1	A
Heptachlor	ND		ug/kg	0.921	0.413	1	A
Aldrin	ND		ug/kg	1.84	0.649	1	A
Heptachlor epoxide	ND		ug/kg	3.46	1.04	1	A
Endrin	ND		ug/kg	0.768	0.315	1	A
Endrin aldehyde	ND		ug/kg	2.30	0.806	1	A
Endrin ketone	ND		ug/kg	1.84	0.474	1	A
Dieldrin	ND		ug/kg	1.15	0.576	1	A
4,4'-DDE	9.23		ug/kg	1.84	0.426	1	A
4,4'-DDD	10.7		ug/kg	1.84	0.657	1	A
4,4'-DDT	10.9		ug/kg	3.46	1.48	1	A
Endosulfan I	ND		ug/kg	1.84	0.435	1	A
Endosulfan II	ND		ug/kg	1.84	0.616	1	A
Endosulfan sulfate	ND		ug/kg	0.768	0.366	1	A
Methoxychlor	ND		ug/kg	3.46	1.08	1	A
Toxaphene	ND		ug/kg	34.6	9.68	1	A
cis-Chlordane	8.02	P	ug/kg	2.30	0.642	1	A
trans-Chlordane	8.84	PI	ug/kg	2.30	0.608	1	A
Chlordane	56.9		ug/kg	15.0	6.10	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	70		30-150	B
Decachlorobiphenyl	102		30-150	B
2,4,5,6-Tetrachloro-m-xylene	99		30-150	A
Decachlorobiphenyl	104		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06
Client ID: SB007 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:31
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 10:05
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.73	0.338	1	A
Lindane	ND		ug/kg	0.720	0.322	1	A
Alpha-BHC	ND		ug/kg	0.720	0.204	1	A
Beta-BHC	ND		ug/kg	1.73	0.655	1	A
Heptachlor	ND		ug/kg	0.864	0.387	1	A
Aldrin	ND		ug/kg	1.73	0.608	1	A
Heptachlor epoxide	ND		ug/kg	3.24	0.972	1	A
Endrin	ND		ug/kg	0.720	0.295	1	A
Endrin aldehyde	ND		ug/kg	2.16	0.756	1	A
Endrin ketone	ND		ug/kg	1.73	0.445	1	A
Dieldrin	ND		ug/kg	1.08	0.540	1	A
4,4'-DDE	ND		ug/kg	1.73	0.399	1	A
4,4'-DDD	ND		ug/kg	1.73	0.616	1	A
4,4'-DDT	ND		ug/kg	3.24	1.39	1	A
Endosulfan I	ND		ug/kg	1.73	0.408	1	A
Endosulfan II	ND		ug/kg	1.73	0.577	1	A
Endosulfan sulfate	ND		ug/kg	0.720	0.343	1	A
Methoxychlor	ND		ug/kg	3.24	1.01	1	A
Toxaphene	ND		ug/kg	32.4	9.07	1	A
cis-Chlordane	ND		ug/kg	2.16	0.602	1	A
trans-Chlordane	ND		ug/kg	2.16	0.570	1	A
Chlordane	ND		ug/kg	14.0	5.72	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	89		30-150	B
Decachlorobiphenyl	99		30-150	B
2,4,5,6-Tetrachloro-m-xylene	92		30-150	A
Decachlorobiphenyl	76		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07
Client ID: SB008 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:44
Analyst: JW
Percent Solids: 91%

Date Collected: 12/14/17 10:25
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.68	0.329	1	A
Lindane	ND		ug/kg	0.700	0.313	1	A
Alpha-BHC	ND		ug/kg	0.700	0.199	1	A
Beta-BHC	ND		ug/kg	1.68	0.637	1	A
Heptachlor	ND		ug/kg	0.840	0.377	1	A
Aldrin	ND		ug/kg	1.68	0.592	1	A
Heptachlor epoxide	3.28	PI	ug/kg	3.15	0.945	1	A
Endrin	ND		ug/kg	0.700	0.287	1	A
Endrin aldehyde	ND		ug/kg	2.10	0.735	1	A
Endrin ketone	ND		ug/kg	1.68	0.433	1	A
Dieldrin	ND		ug/kg	1.05	0.525	1	A
4,4'-DDE	61.9		ug/kg	1.68	0.388	1	A
4,4'-DDD	8.82		ug/kg	1.68	0.599	1	B
4,4'-DDT	60.3		ug/kg	3.15	1.35	1	B
Endosulfan I	ND		ug/kg	1.68	0.397	1	A
Endosulfan II	ND		ug/kg	1.68	0.562	1	A
Endosulfan sulfate	ND		ug/kg	0.700	0.333	1	A
Methoxychlor	ND		ug/kg	3.15	0.980	1	A
Toxaphene	ND		ug/kg	31.5	8.82	1	A
cis-Chlordane	11.8		ug/kg	2.10	0.585	1	A
trans-Chlordane	11.3	P	ug/kg	2.10	0.554	1	A
Chlordane	55.2		ug/kg	13.6	5.57	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	96		30-150	B
Decachlorobiphenyl	143		30-150	B
2,4,5,6-Tetrachloro-m-xylene	100		30-150	A
Decachlorobiphenyl	118		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08
Client ID: SB008 (10-12)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:56
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 10:30
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.72	0.336	1	A
Lindane	ND		ug/kg	0.716	0.320	1	A
Alpha-BHC	ND		ug/kg	0.716	0.203	1	A
Beta-BHC	ND		ug/kg	1.72	0.651	1	A
Heptachlor	ND		ug/kg	0.859	0.385	1	A
Aldrin	ND		ug/kg	1.72	0.605	1	A
Heptachlor epoxide	ND		ug/kg	3.22	0.966	1	A
Endrin	ND		ug/kg	0.716	0.294	1	A
Endrin aldehyde	ND		ug/kg	2.15	0.752	1	A
Endrin ketone	ND		ug/kg	1.72	0.442	1	A
Dieldrin	ND		ug/kg	1.07	0.537	1	A
4,4'-DDE	ND		ug/kg	1.72	0.397	1	A
4,4'-DDD	ND		ug/kg	1.72	0.613	1	A
4,4'-DDT	ND		ug/kg	3.22	1.38	1	A
Endosulfan I	ND		ug/kg	1.72	0.406	1	A
Endosulfan II	ND		ug/kg	1.72	0.574	1	A
Endosulfan sulfate	ND		ug/kg	0.716	0.341	1	A
Methoxychlor	ND		ug/kg	3.22	1.00	1	A
Toxaphene	ND		ug/kg	32.2	9.02	1	A
cis-Chlordane	ND		ug/kg	2.15	0.598	1	A
trans-Chlordane	ND		ug/kg	2.15	0.567	1	A
Chlordane	ND		ug/kg	14.0	5.69	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	92		30-150	B
Decachlorobiphenyl	91		30-150	B
2,4,5,6-Tetrachloro-m-xylene	93		30-150	A
Decachlorobiphenyl	81		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09
Client ID: SB009 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 18:09
Analyst: JW
Percent Solids: 86%

Date Collected: 12/14/17 10:50
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.77	0.348	1	A
Lindane	ND		ug/kg	0.739	0.330	1	A
Alpha-BHC	ND		ug/kg	0.739	0.210	1	A
Beta-BHC	ND		ug/kg	1.77	0.673	1	A
Heptachlor	ND		ug/kg	0.887	0.398	1	A
Aldrin	ND		ug/kg	1.77	0.625	1	A
Heptachlor epoxide	2.11	J	ug/kg	3.33	0.998	1	A
Endrin	ND		ug/kg	0.739	0.303	1	A
Endrin aldehyde	ND		ug/kg	2.22	0.776	1	A
Endrin ketone	ND		ug/kg	1.77	0.457	1	A
Dieldrin	ND		ug/kg	1.11	0.555	1	A
4,4'-DDE	3.10	P	ug/kg	1.77	0.410	1	A
4,4'-DDD	3.47		ug/kg	1.77	0.633	1	A
4,4'-DDT	12.4		ug/kg	3.33	1.43	1	A
Endosulfan I	ND		ug/kg	1.77	0.419	1	A
Endosulfan II	ND		ug/kg	1.77	0.593	1	A
Endosulfan sulfate	ND		ug/kg	0.739	0.352	1	A
Methoxychlor	ND		ug/kg	3.33	1.04	1	A
Toxaphene	ND		ug/kg	33.3	9.32	1	A
cis-Chlordane	2.18	J	ug/kg	2.22	0.618	1	A
trans-Chlordane	3.57	PI	ug/kg	2.22	0.586	1	A
Chlordane	47.4	P	ug/kg	14.4	5.88	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85		30-150	B
Decachlorobiphenyl	104		30-150	B
2,4,5,6-Tetrachloro-m-xylene	101		30-150	A
Decachlorobiphenyl	101		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10
Client ID: SB009 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 18:21
Analyst: JW
Percent Solids: 88%

Date Collected: 12/14/17 10:55
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.74	0.341	1	A
Lindane	ND		ug/kg	0.725	0.324	1	A
Alpha-BHC	ND		ug/kg	0.725	0.206	1	A
Beta-BHC	ND		ug/kg	1.74	0.660	1	A
Heptachlor	ND		ug/kg	0.870	0.390	1	A
Aldrin	ND		ug/kg	1.74	0.613	1	A
Heptachlor epoxide	ND		ug/kg	3.26	0.979	1	A
Endrin	ND		ug/kg	0.725	0.297	1	A
Endrin aldehyde	ND		ug/kg	2.18	0.762	1	A
Endrin ketone	ND		ug/kg	1.74	0.448	1	A
Dieldrin	ND		ug/kg	1.09	0.544	1	A
4,4'-DDE	ND		ug/kg	1.74	0.402	1	A
4,4'-DDD	ND		ug/kg	1.74	0.621	1	A
4,4'-DDT	ND		ug/kg	3.26	1.40	1	A
Endosulfan I	ND		ug/kg	1.74	0.411	1	A
Endosulfan II	ND		ug/kg	1.74	0.582	1	A
Endosulfan sulfate	ND		ug/kg	0.725	0.345	1	A
Methoxychlor	ND		ug/kg	3.26	1.02	1	A
Toxaphene	ND		ug/kg	32.6	9.14	1	A
cis-Chlordane	ND		ug/kg	2.18	0.606	1	A
trans-Chlordane	ND		ug/kg	2.18	0.574	1	A
Chlordane	ND		ug/kg	14.1	5.77	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	87		30-150	B
Decachlorobiphenyl	96		30-150	B
2,4,5,6-Tetrachloro-m-xylene	88		30-150	A
Decachlorobiphenyl	76		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11
Client ID: SB010 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 18:33
Analyst: JW
Percent Solids: 80%

Date Collected: 12/14/17 11:05
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	2.00	0.391	1	A
Lindane	ND		ug/kg	0.832	0.372	1	A
Alpha-BHC	ND		ug/kg	0.832	0.236	1	A
Beta-BHC	ND		ug/kg	2.00	0.758	1	A
Heptachlor	ND		ug/kg	0.999	0.448	1	A
Aldrin	ND		ug/kg	2.00	0.703	1	A
Heptachlor epoxide	2.54	J	ug/kg	3.75	1.12	1	A
Endrin	ND		ug/kg	0.832	0.341	1	A
Endrin aldehyde	ND		ug/kg	2.50	0.874	1	A
Endrin ketone	ND		ug/kg	2.00	0.514	1	A
Dieldrin	54.3		ug/kg	1.25	0.624	1	B
4,4'-DDE	13.2		ug/kg	2.00	0.462	1	A
4,4'-DDD	1.89	JPI	ug/kg	2.00	0.713	1	A
4,4'-DDT	62.0		ug/kg	3.75	1.61	1	A
Endosulfan I	ND		ug/kg	2.00	0.472	1	A
Endosulfan II	ND		ug/kg	2.00	0.668	1	A
Endosulfan sulfate	ND		ug/kg	0.832	0.396	1	A
Methoxychlor	ND		ug/kg	3.75	1.16	1	A
Toxaphene	ND		ug/kg	37.5	10.5	1	A
cis-Chlordane	14.2	P	ug/kg	2.50	0.696	1	A
trans-Chlordane	11.3	P	ug/kg	2.50	0.659	1	A
Chlordane	61.0		ug/kg	16.2	6.62	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	95		30-150	B
Decachlorobiphenyl	102		30-150	B
2,4,5,6-Tetrachloro-m-xylene	99		30-150	A
Decachlorobiphenyl	90		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12
Client ID: SB010 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 18:46
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 11:10
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.75	0.342	1	A
Lindane	ND		ug/kg	0.728	0.325	1	A
Alpha-BHC	ND		ug/kg	0.728	0.207	1	A
Beta-BHC	ND		ug/kg	1.75	0.662	1	A
Heptachlor	ND		ug/kg	0.874	0.392	1	A
Aldrin	ND		ug/kg	1.75	0.615	1	A
Heptachlor epoxide	ND		ug/kg	3.28	0.983	1	A
Endrin	ND		ug/kg	0.728	0.298	1	A
Endrin aldehyde	ND		ug/kg	2.18	0.764	1	A
Endrin ketone	ND		ug/kg	1.75	0.450	1	A
Dieldrin	ND		ug/kg	1.09	0.546	1	A
4,4'-DDE	ND		ug/kg	1.75	0.404	1	A
4,4'-DDD	ND		ug/kg	1.75	0.623	1	A
4,4'-DDT	ND		ug/kg	3.28	1.40	1	A
Endosulfan I	ND		ug/kg	1.75	0.413	1	A
Endosulfan II	ND		ug/kg	1.75	0.584	1	A
Endosulfan sulfate	ND		ug/kg	0.728	0.346	1	A
Methoxychlor	ND		ug/kg	3.28	1.02	1	A
Toxaphene	ND		ug/kg	32.8	9.17	1	A
cis-Chlordane	ND		ug/kg	2.18	0.609	1	A
trans-Chlordane	ND		ug/kg	2.18	0.577	1	A
Chlordane	ND		ug/kg	14.2	5.79	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		30-150	B
Decachlorobiphenyl	67		30-150	B
2,4,5,6-Tetrachloro-m-xylene	75		30-150	A
Decachlorobiphenyl	55		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13
Client ID: SB011 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 18:58
Analyst: JW
Percent Solids: 89%

Date Collected: 12/14/17 11:20
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.73	0.338	1	A
Lindane	ND		ug/kg	0.720	0.322	1	A
Alpha-BHC	ND		ug/kg	0.720	0.204	1	A
Beta-BHC	ND		ug/kg	1.73	0.655	1	A
Heptachlor	ND		ug/kg	0.864	0.387	1	A
Aldrin	ND		ug/kg	1.73	0.608	1	A
Heptachlor epoxide	ND		ug/kg	3.24	0.972	1	A
Endrin	ND		ug/kg	0.720	0.295	1	A
Endrin aldehyde	ND		ug/kg	2.16	0.756	1	A
Endrin ketone	ND		ug/kg	1.73	0.445	1	A
Dieldrin	7.33		ug/kg	1.08	0.540	1	B
4,4'-DDE	4.04		ug/kg	1.73	0.400	1	A
4,4'-DDD	3.48		ug/kg	1.73	0.616	1	B
4,4'-DDT	25.3		ug/kg	3.24	1.39	1	A
Endosulfan I	ND		ug/kg	1.73	0.408	1	A
Endosulfan II	ND		ug/kg	1.73	0.578	1	A
Endosulfan sulfate	ND		ug/kg	0.720	0.343	1	A
Methoxychlor	ND		ug/kg	3.24	1.01	1	A
Toxaphene	ND		ug/kg	32.4	9.07	1	A
cis-Chlordane	2.05	J	ug/kg	2.16	0.602	1	A
trans-Chlordane	2.52	PI	ug/kg	2.16	0.570	1	A
Chlordane	12.0	J	ug/kg	14.0	5.72	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	80		30-150	B
Decachlorobiphenyl	107		30-150	B
2,4,5,6-Tetrachloro-m-xylene	88		30-150	A
Decachlorobiphenyl	80		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14
Client ID: SB011 (5-7)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:05
Analyst: JW
Percent Solids: 92%

Date Collected: 12/14/17 11:25
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 22:46
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.68	0.330	1	A
Lindane	ND		ug/kg	0.702	0.314	1	A
Alpha-BHC	ND		ug/kg	0.702	0.199	1	A
Beta-BHC	ND		ug/kg	1.68	0.639	1	A
Heptachlor	ND		ug/kg	0.843	0.378	1	A
Aldrin	ND		ug/kg	1.68	0.593	1	A
Heptachlor epoxide	ND		ug/kg	3.16	0.948	1	A
Endrin	ND		ug/kg	0.702	0.288	1	A
Endrin aldehyde	ND		ug/kg	2.11	0.737	1	A
Endrin ketone	ND		ug/kg	1.68	0.434	1	A
Dieldrin	ND		ug/kg	1.05	0.527	1	A
4,4'-DDE	ND		ug/kg	1.68	0.390	1	A
4,4'-DDD	ND		ug/kg	1.68	0.601	1	A
4,4'-DDT	ND		ug/kg	3.16	1.36	1	A
Endosulfan I	ND		ug/kg	1.68	0.398	1	A
Endosulfan II	ND		ug/kg	1.68	0.563	1	A
Endosulfan sulfate	ND		ug/kg	0.702	0.334	1	A
Methoxychlor	ND		ug/kg	3.16	0.983	1	A
Toxaphene	ND		ug/kg	31.6	8.85	1	A
cis-Chlordane	ND		ug/kg	2.11	0.587	1	A
trans-Chlordane	ND		ug/kg	2.11	0.556	1	A
Chlordane	ND		ug/kg	13.7	5.58	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	80		30-150	B
Decachlorobiphenyl	79		30-150	B
2,4,5,6-Tetrachloro-m-xylene	86		30-150	A
Decachlorobiphenyl	68		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15
Client ID: SB012 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:18
Analyst: JW
Percent Solids: 88%

Date Collected: 12/14/17 11:40
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 22:46
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.72	0.338	1	A
Lindane	ND		ug/kg	0.719	0.321	1	A
Alpha-BHC	ND		ug/kg	0.719	0.204	1	A
Beta-BHC	ND		ug/kg	1.72	0.654	1	A
Heptachlor	ND		ug/kg	0.862	0.387	1	A
Aldrin	ND		ug/kg	1.72	0.607	1	A
Heptachlor epoxide	ND		ug/kg	3.23	0.970	1	A
Endrin	ND		ug/kg	0.719	0.295	1	A
Endrin aldehyde	ND		ug/kg	2.16	0.755	1	A
Endrin ketone	ND		ug/kg	1.72	0.444	1	A
Dieldrin	ND		ug/kg	1.08	0.539	1	A
4,4'-DDE	ND		ug/kg	1.72	0.399	1	A
4,4'-DDD	ND		ug/kg	1.72	0.615	1	A
4,4'-DDT	ND		ug/kg	3.23	1.39	1	A
Endosulfan I	ND		ug/kg	1.72	0.408	1	A
Endosulfan II	ND		ug/kg	1.72	0.576	1	A
Endosulfan sulfate	ND		ug/kg	0.719	0.342	1	A
Methoxychlor	ND		ug/kg	3.23	1.01	1	A
Toxaphene	ND		ug/kg	32.3	9.06	1	A
cis-Chlordane	ND		ug/kg	2.16	0.601	1	A
trans-Chlordane	ND		ug/kg	2.16	0.569	1	A
Chlordane	ND		ug/kg	14.0	5.71	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	80		30-150	B
Decachlorobiphenyl	86		30-150	B
2,4,5,6-Tetrachloro-m-xylene	86		30-150	A
Decachlorobiphenyl	77		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16
Client ID: SB012 (6-8)
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:31
Analyst: JW
Percent Solids: 92%

Date Collected: 12/14/17 11:45
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 22:46
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.70	0.332	1	A
Lindane	ND		ug/kg	0.707	0.316	1	A
Alpha-BHC	ND		ug/kg	0.707	0.201	1	A
Beta-BHC	ND		ug/kg	1.70	0.643	1	A
Heptachlor	ND		ug/kg	0.848	0.380	1	A
Aldrin	ND		ug/kg	1.70	0.597	1	A
Heptachlor epoxide	ND		ug/kg	3.18	0.954	1	A
Endrin	ND		ug/kg	0.707	0.290	1	A
Endrin aldehyde	ND		ug/kg	2.12	0.742	1	A
Endrin ketone	ND		ug/kg	1.70	0.437	1	A
Dieldrin	ND		ug/kg	1.06	0.530	1	A
4,4'-DDE	ND		ug/kg	1.70	0.392	1	A
4,4'-DDD	ND		ug/kg	1.70	0.605	1	A
4,4'-DDT	ND		ug/kg	3.18	1.36	1	A
Endosulfan I	ND		ug/kg	1.70	0.401	1	A
Endosulfan II	ND		ug/kg	1.70	0.567	1	A
Endosulfan sulfate	ND		ug/kg	0.707	0.336	1	A
Methoxychlor	ND		ug/kg	3.18	0.990	1	A
Toxaphene	ND		ug/kg	31.8	8.91	1	A
cis-Chlordane	ND		ug/kg	2.12	0.591	1	A
trans-Chlordane	ND		ug/kg	2.12	0.560	1	A
Chlordane	ND		ug/kg	13.8	5.62	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	85		30-150	B
Decachlorobiphenyl	72		30-150	B
2,4,5,6-Tetrachloro-m-xylene	82		30-150	A
Decachlorobiphenyl	57		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17
Client ID: DUP002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Soil
Analytical Method: 1,8081B
Analytical Date: 12/24/17 17:44
Analyst: JW
Percent Solids: 87%

Date Collected: 12/14/17 00:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3546
Extraction Date: 12/21/17 22:46
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/kg	1.80	0.352	1	A
Lindane	ND		ug/kg	0.748	0.335	1	A
Alpha-BHC	ND		ug/kg	0.748	0.212	1	A
Beta-BHC	ND		ug/kg	1.80	0.681	1	A
Heptachlor	ND		ug/kg	0.898	0.403	1	A
Aldrin	ND		ug/kg	1.80	0.632	1	A
Heptachlor epoxide	ND		ug/kg	3.37	1.01	1	A
Endrin	ND		ug/kg	0.748	0.307	1	A
Endrin aldehyde	ND		ug/kg	2.24	0.786	1	A
Endrin ketone	ND		ug/kg	1.80	0.463	1	A
Dieldrin	ND		ug/kg	1.12	0.561	1	A
4,4'-DDE	4.73	P	ug/kg	1.80	0.415	1	A
4,4'-DDD	10.4		ug/kg	1.80	0.641	1	B
4,4'-DDT	4.92		ug/kg	3.37	1.44	1	A
Endosulfan I	ND		ug/kg	1.80	0.424	1	A
Endosulfan II	ND		ug/kg	1.80	0.600	1	A
Endosulfan sulfate	ND		ug/kg	0.748	0.356	1	A
Methoxychlor	ND		ug/kg	3.37	1.05	1	A
Toxaphene	ND		ug/kg	33.7	9.43	1	A
cis-Chlordane	3.08		ug/kg	2.24	0.626	1	B
trans-Chlordane	3.09	PI	ug/kg	2.24	0.593	1	A
Chlordane	63.4		ug/kg	14.6	5.95	1	B

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	139		30-150	B
Decachlorobiphenyl	86		30-150	B
2,4,5,6-Tetrachloro-m-xylene	84		30-150	A
Decachlorobiphenyl	74		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18
Client ID: FIELDBLANK002
Sample Location: 718 E. 212TH STREET, BRONX, NY

Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 12/20/17 16:02
Analyst: KEG

Date Collected: 12/14/17 12:00
Date Received: 12/14/17
Field Prep: Not Specified
Extraction Method: EPA 3510C
Extraction Date: 12/20/17 01:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Organochlorine Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.020	0.005	1	A
Lindane	ND		ug/l	0.020	0.004	1	A
Alpha-BHC	ND		ug/l	0.020	0.004	1	A
Beta-BHC	ND		ug/l	0.020	0.006	1	A
Heptachlor	ND		ug/l	0.020	0.003	1	A
Aldrin	ND		ug/l	0.020	0.002	1	A
Heptachlor epoxide	ND		ug/l	0.020	0.004	1	A
Endrin	ND		ug/l	0.040	0.004	1	A
Endrin aldehyde	ND		ug/l	0.040	0.008	1	A
Endrin ketone	ND		ug/l	0.040	0.005	1	A
Dieldrin	ND		ug/l	0.040	0.004	1	A
4,4'-DDE	ND		ug/l	0.040	0.004	1	A
4,4'-DDD	ND		ug/l	0.040	0.005	1	A
4,4'-DDT	ND		ug/l	0.040	0.004	1	A
Endosulfan I	ND		ug/l	0.020	0.003	1	A
Endosulfan II	ND		ug/l	0.040	0.005	1	A
Endosulfan sulfate	ND		ug/l	0.040	0.005	1	A
Methoxychlor	ND		ug/l	0.200	0.007	1	A
Toxaphene	ND		ug/l	0.200	0.063	1	A
cis-Chlordane	ND		ug/l	0.020	0.007	1	A
trans-Chlordane	ND		ug/l	0.020	0.006	1	A
Chlordane	ND		ug/l	0.200	0.046	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	115		30-150	A
Decachlorobiphenyl	107		30-150	A
2,4,5,6-Tetrachloro-m-xylene	114		30-150	B
Decachlorobiphenyl	104		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/20/17 12:53
Analyst: KEG

Extraction Method: EPA 3510C
Extraction Date: 12/20/17 01:50

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 18 Batch: WG1074698-1						
Delta-BHC	ND		ug/l	0.020	0.005	A
Lindane	ND		ug/l	0.020	0.004	A
Alpha-BHC	ND		ug/l	0.020	0.004	A
Beta-BHC	ND		ug/l	0.020	0.006	A
Heptachlor	ND		ug/l	0.020	0.003	A
Aldrin	ND		ug/l	0.020	0.002	A
Heptachlor epoxide	ND		ug/l	0.020	0.004	A
Endrin	ND		ug/l	0.040	0.004	A
Endrin aldehyde	ND		ug/l	0.040	0.008	A
Endrin ketone	ND		ug/l	0.040	0.005	A
Dieldrin	ND		ug/l	0.040	0.004	A
4,4'-DDE	ND		ug/l	0.040	0.004	A
4,4'-DDD	ND		ug/l	0.040	0.005	A
4,4'-DDT	ND		ug/l	0.040	0.004	A
Endosulfan I	ND		ug/l	0.020	0.003	A
Endosulfan II	ND		ug/l	0.040	0.005	A
Endosulfan sulfate	ND		ug/l	0.040	0.005	A
Methoxychlor	ND		ug/l	0.200	0.007	A
Toxaphene	ND		ug/l	0.200	0.063	A
cis-Chlordane	ND		ug/l	0.020	0.007	A
trans-Chlordane	ND		ug/l	0.020	0.006	A
Chlordane	ND		ug/l	0.200	0.046	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/20/17 12:53
Analyst: KEG

Extraction Method: EPA 3510C
Extraction Date: 12/20/17 01:50

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 18 Batch: WG1074698-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	94		30-150	A
Decachlorobiphenyl	118		30-150	A
2,4,5,6-Tetrachloro-m-xylene	96		30-150	B
Decachlorobiphenyl	107		30-150	B

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/22/17 14:18
Analyst: KEG

Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-13 Batch: WG1075287-1						
Delta-BHC	ND		ug/kg	1.56	0.305	A
Lindane	ND		ug/kg	0.650	0.290	A
Alpha-BHC	ND		ug/kg	0.650	0.184	A
Beta-BHC	ND		ug/kg	1.56	0.591	A
Heptachlor	ND		ug/kg	0.780	0.350	A
Aldrin	ND		ug/kg	1.56	0.549	A
Heptachlor epoxide	ND		ug/kg	2.92	0.877	A
Endrin	ND		ug/kg	0.650	0.266	A
Endrin aldehyde	ND		ug/kg	1.95	0.682	A
Endrin ketone	ND		ug/kg	1.56	0.402	A
Dieldrin	ND		ug/kg	0.975	0.487	A
4,4'-DDE	ND		ug/kg	1.56	0.361	A
4,4'-DDD	ND		ug/kg	1.56	0.556	A
4,4'-DDT	ND		ug/kg	2.92	1.25	A
Endosulfan I	ND		ug/kg	1.56	0.368	A
Endosulfan II	ND		ug/kg	1.56	0.521	A
Endosulfan sulfate	ND		ug/kg	0.650	0.309	A
Methoxychlor	ND		ug/kg	2.92	0.910	A
Toxaphene	ND		ug/kg	29.2	8.19	A
cis-Chlordane	ND		ug/kg	1.95	0.543	A
trans-Chlordane	ND		ug/kg	1.95	0.515	A
Chlordane	ND		ug/kg	12.7	5.16	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/22/17 14:18
Analyst: KEG

Extraction Method: EPA 3546
Extraction Date: 12/21/17 07:54
Cleanup Method: EPA 3620B
Cleanup Date: 12/22/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 01-13 Batch: WG1075287-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	92		30-150	B
Decachlorobiphenyl	103		30-150	B
2,4,5,6-Tetrachloro-m-xylene	107		30-150	A
Decachlorobiphenyl	115		30-150	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/24/17 16:27
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 12/21/17 22:46
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 14-17 Batch: WG1075638-1						
Delta-BHC	ND		ug/kg	1.57	0.307	A
Lindane	ND		ug/kg	0.653	0.292	A
Alpha-BHC	ND		ug/kg	0.653	0.185	A
Beta-BHC	ND		ug/kg	1.57	0.594	A
Heptachlor	ND		ug/kg	0.783	0.351	A
Aldrin	ND		ug/kg	1.57	0.552	A
Heptachlor epoxide	ND		ug/kg	2.94	0.881	A
Endrin	ND		ug/kg	0.653	0.268	A
Endrin aldehyde	ND		ug/kg	1.96	0.685	A
Endrin ketone	ND		ug/kg	1.57	0.403	A
Dieldrin	ND		ug/kg	0.979	0.490	A
4,4'-DDE	ND		ug/kg	1.57	0.362	A
4,4'-DDD	ND		ug/kg	1.57	0.559	A
4,4'-DDT	ND		ug/kg	2.94	1.26	A
Endosulfan I	ND		ug/kg	1.57	0.370	A
Endosulfan II	ND		ug/kg	1.57	0.523	A
Endosulfan sulfate	ND		ug/kg	0.653	0.311	A
Methoxychlor	ND		ug/kg	2.94	0.914	A
Toxaphene	ND		ug/kg	29.4	8.22	A
cis-Chlordane	ND		ug/kg	1.96	0.546	A
trans-Chlordane	ND		ug/kg	1.96	0.517	A
Chlordane	ND		ug/kg	12.7	5.19	A

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 12/24/17 16:27
Analyst: JW

Extraction Method: EPA 3546
Extraction Date: 12/21/17 22:46
Cleanup Method: EPA 3620B
Cleanup Date: 12/23/17

Parameter	Result	Qualifier	Units	RL	MDL	Column
Organochlorine Pesticides by GC - Westborough Lab for sample(s): 14-17 Batch: WG1075638-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	96		30-150	B
Decachlorobiphenyl	92		30-150	B
2,4,5,6-Tetrachloro-m-xylene	101		30-150	A
Decachlorobiphenyl	82		30-150	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 18 Batch: WG1074698-2 WG1074698-3									
Delta-BHC	115		117		30-150	2		20	A
Lindane	109		109		30-150	0		20	A
Alpha-BHC	109		110		30-150	1		20	A
Beta-BHC	114		114		30-150	0		20	A
Heptachlor	103		105		30-150	2		20	A
Aldrin	109		110		30-150	1		20	A
Heptachlor epoxide	119		123		30-150	3		20	A
Endrin	110		116		30-150	5		20	A
Endrin aldehyde	111		111		30-150	0		20	A
Endrin ketone	123		124		30-150	1		20	A
Dieldrin	120		120		30-150	0		20	A
4,4'-DDE	112		115		30-150	3		20	A
4,4'-DDD	110		112		30-150	2		20	A
4,4'-DDT	112		112		30-150	0		20	A
Endosulfan I	116		118		30-150	2		20	A
Endosulfan II	115		119		30-150	3		20	A
Endosulfan sulfate	119		124		30-150	4		20	A
Methoxychlor	117		126		30-150	7		20	A
cis-Chlordane	112		116		30-150	4		20	A
trans-Chlordane	117		118		30-150	1		20	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 18 Batch: WG1074698-2 WG1074698-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	88		89		30-150	A
Decachlorobiphenyl	99		105		30-150	A
2,4,5,6-Tetrachloro-m-xylene	89		91		30-150	B
Decachlorobiphenyl	91		97		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-13 Batch: WG1075287-2 WG1075287-3									
Delta-BHC	107		127		30-150	17		30	A
Lindane	98		114		30-150	15		30	A
Alpha-BHC	105		124		30-150	17		30	A
Beta-BHC	100		117		30-150	16		30	A
Heptachlor	106		123		30-150	15		30	A
Aldrin	100		116		30-150	15		30	A
Heptachlor epoxide	103		120		30-150	15		30	A
Endrin	104		122		30-150	16		30	A
Endrin aldehyde	102		115		30-150	12		30	A
Endrin ketone	113		130		30-150	14		30	A
Dieldrin	114		131		30-150	14		30	A
4,4'-DDE	102		119		30-150	15		30	A
4,4'-DDD	102		117		30-150	14		30	A
4,4'-DDT	116		136		30-150	16		30	A
Endosulfan I	102		118		30-150	15		30	A
Endosulfan II	106		123		30-150	15		30	A
Endosulfan sulfate	81		90		30-150	11		30	A
Methoxychlor	111		129		30-150	15		30	A
cis-Chlordane	90		102		30-150	13		30	A
trans-Chlordane	84		98		30-150	15		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-13 Batch: WG1075287-2 WG1075287-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	82		96		30-150	B
Decachlorobiphenyl	87		104		30-150	B
2,4,5,6-Tetrachloro-m-xylene	105		124		30-150	A
Decachlorobiphenyl	118		139		30-150	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 14-17 Batch: WG1075638-2 WG1075638-3									
Delta-BHC	95		95		30-150	0		30	A
Lindane	92		90		30-150	2		30	A
Alpha-BHC	104		102		30-150	2		30	A
Beta-BHC	91		87		30-150	4		30	A
Heptachlor	99		99		30-150	0		30	A
Aldrin	101		98		30-150	3		30	A
Heptachlor epoxide	83		78		30-150	6		30	A
Endrin	88		86		30-150	2		30	A
Endrin aldehyde	52		56		30-150	7		30	A
Endrin ketone	64		70		30-150	9		30	A
Dieldrin	100		98		30-150	2		30	A
4,4'-DDE	108		103		30-150	5		30	A
4,4'-DDD	90		91		30-150	1		30	A
4,4'-DDT	94		93		30-150	1		30	A
Endosulfan I	95		92		30-150	3		30	A
Endosulfan II	79		82		30-150	4		30	A
Endosulfan sulfate	54		60		30-150	11		30	A
Methoxychlor	70		72		30-150	3		30	A
cis-Chlordane	83		81		30-150	2		30	A
trans-Chlordane	84		78		30-150	7		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 14-17 Batch: WG1075638-2 WG1075638-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	93		87		30-150	B
Decachlorobiphenyl	86		81		30-150	B
2,4,5,6-Tetrachloro-m-xylene	95		92		30-150	A
Decachlorobiphenyl	76		72		30-150	A

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits	Column
Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-13 QC Batch ID: WG1075287-4 WG1075287-5 QC Sample: L1746315-03 Client ID: SB006 (0-2)													
Delta-BHC	1.56J	37	37.0	100		39.7	106		30-150	7		50	A
Lindane	ND	37	34.8	94		37.4	100		30-150	7		50	A
Alpha-BHC	ND	37	38.3	104		40.0	106		30-150	4		50	A
Beta-BHC	ND	37	44.0	119		46.0	122		30-150	4		50	A
Heptachlor	ND	37	27.6	75		29.1	78		30-150	5		50	A
Aldrin	ND	37	35.2	95		37.4	100		30-150	6		50	A
Heptachlor epoxide	ND	37	33.2	90		37.5	100		30-150	12		50	A
Endrin	ND	37	41.6	112		42.9	114		30-150	3		50	A
Endrin aldehyde	ND	37	31.9	86		33.4	89		30-150	5		50	A
Endrin ketone	ND	37	33.8	91		37.3	99		30-150	10		50	A
Dieldrin	ND	37	36.6	99		38.8	103		30-150	6		50	A
4,4'-DDE	5.60	37	36.2	83		39.2	90		30-150	8		50	A
4,4'-DDD	8.75	37	40.9	87		42.5	90		30-150	4		50	B
4,4'-DDT	ND	37	39.2	106		44.1	117		30-150	12		50	A
Endosulfan I	ND	37	34.9	94		37.7	100		30-150	8		50	A
Endosulfan II	ND	37	34.2	93		38.5	103		30-150	12		50	A
Endosulfan sulfate	ND	37	30.1	81		31.6	84		30-150	5		50	A
Methoxychlor	ND	37	35.1	95		37.1	99		30-150	6		50	A
cis-Chlordane	1.10J	37	36.8	100		35.2	94		30-150	4		50	A
trans-Chlordane	0.910J	37	31.3	85		30.0	80		30-150	4		50	B

Matrix Spike Analysis

Batch Quality Control

Project Name: BBU1702 ***Lab Number:*** L1746315

Project Number: BBU1702 ***Report Date:*** 12/26/17

Parameter	*Native Sample*	*MS Added*	*MS Found*	*MS %Recovery*	*Qual*	*MSD Found*	*MSD %Recovery*	*Qual*	*Recovery Limits*	*RPD*	*Qual*	*RPD Limits*

Organochlorine Pesticides by GC - Westborough Lab Associated sample(s): 01-13 QC Batch ID: WG1075287-4 WG1075287-5 QC Sample: L1746315-03 Client ID: SB006 (0-2)

Surrogate	*MS % Recovery*	*MS Qualifier*	*MSD % Recovery*	*MSD Qualifier*	*Acceptance Criteria*	*Column*
2,4,5,6-Tetrachloro-m-xylene	113		116		30-150	B
Decachlorobiphenyl	141		138		30-150	B
2,4,5,6-Tetrachloro-m-xylene	102		102		30-150	A
Decachlorobiphenyl	148		147		30-150	A

METALS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01 Date Collected: 12/14/17 09:30

Client ID: SB005 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	2090		mg/kg	8.98	2.42	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Antimony, Total	0.359	J	mg/kg	4.49	0.341	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Arsenic, Total	6.40		mg/kg	0.898	0.187	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Barium, Total	123		mg/kg	0.898	0.156	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Beryllium, Total	0.242	J	mg/kg	0.449	0.030	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Cadmium, Total	0.171	J	mg/kg	0.898	0.088	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Calcium, Total	1680		mg/kg	8.98	3.14	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Chromium, Total	4.54		mg/kg	0.898	0.086	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Cobalt, Total	2.75		mg/kg	1.80	0.149	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Copper, Total	28.4		mg/kg	0.898	0.232	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Iron, Total	3060		mg/kg	4.49	0.811	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Lead, Total	34.9		mg/kg	4.49	0.241	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Magnesium, Total	238		mg/kg	8.98	1.38	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Manganese, Total	20.7		mg/kg	0.898	0.143	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Mercury, Total	0.12		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:05	EPA 7471B	1,7471B	EA
Nickel, Total	8.15		mg/kg	2.24	0.217	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Potassium, Total	187	J	mg/kg	224	12.9	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Selenium, Total	0.260	J	mg/kg	1.80	0.232	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Silver, Total	ND		mg/kg	0.898	0.254	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Sodium, Total	89.3	J	mg/kg	180	2.83	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Thallium, Total	ND		mg/kg	1.80	0.283	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Vanadium, Total	11.8		mg/kg	0.898	0.182	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS
Zinc, Total	126		mg/kg	4.49	0.263	2	12/21/17 22:23	12/22/17 16:46	EPA 3050B	1,6010C	PS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02 Date Collected: 12/14/17 09:35

Client ID: SB005 (3-5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 84%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	12200		mg/kg	9.41	2.54	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Antimony, Total	ND		mg/kg	4.70	0.358	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Arsenic, Total	2.99		mg/kg	0.941	0.196	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Barium, Total	39.5		mg/kg	0.941	0.164	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Beryllium, Total	0.254	J	mg/kg	0.470	0.031	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Cadmium, Total	ND		mg/kg	0.941	0.092	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Calcium, Total	1200		mg/kg	9.41	3.29	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Chromium, Total	19.4		mg/kg	0.941	0.090	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Cobalt, Total	5.98		mg/kg	1.88	0.156	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Copper, Total	13.6		mg/kg	0.941	0.243	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Iron, Total	14700		mg/kg	4.70	0.850	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Lead, Total	11.6		mg/kg	4.70	0.252	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Magnesium, Total	2690		mg/kg	9.41	1.45	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Manganese, Total	172		mg/kg	0.941	0.150	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Mercury, Total	ND		mg/kg	0.08	0.02	1	12/21/17 08:10	12/21/17 19:07	EPA 7471B	1,7471B	EA
Nickel, Total	11.2		mg/kg	2.35	0.228	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Potassium, Total	476		mg/kg	235	13.6	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Selenium, Total	0.499	J	mg/kg	1.88	0.243	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Silver, Total	ND		mg/kg	0.941	0.266	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Sodium, Total	9.64	J	mg/kg	188	2.96	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Thallium, Total	ND		mg/kg	1.88	0.296	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Vanadium, Total	32.4		mg/kg	0.941	0.191	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS
Zinc, Total	34.9		mg/kg	4.70	0.276	2	12/21/17 22:23	12/22/17 16:51	EPA 3050B	1,6010C	PS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03 Date Collected: 12/14/17 09:45

Client ID: SB006 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	10800		mg/kg	8.68	2.34	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Antimony, Total	2.29	J	mg/kg	4.34	0.330	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Arsenic, Total	5.22		mg/kg	0.868	0.181	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Barium, Total	225		mg/kg	0.868	0.151	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Beryllium, Total	0.486		mg/kg	0.434	0.029	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Cadmium, Total	0.799	J	mg/kg	0.868	0.085	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Calcium, Total	2790		mg/kg	8.68	3.04	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Chromium, Total	24.9		mg/kg	0.868	0.083	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Cobalt, Total	8.17		mg/kg	1.74	0.144	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Copper, Total	84.5		mg/kg	0.868	0.224	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Iron, Total	20800		mg/kg	4.34	0.784	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Lead, Total	420		mg/kg	4.34	0.233	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Magnesium, Total	2910		mg/kg	8.68	1.34	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Manganese, Total	681		mg/kg	0.868	0.138	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Mercury, Total	0.45		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 18:55	EPA 7471B	1,7471B	EA
Nickel, Total	15.0		mg/kg	2.17	0.210	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Potassium, Total	1050		mg/kg	217	12.5	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Selenium, Total	1.02	J	mg/kg	1.74	0.224	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.868	0.246	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Sodium, Total	38.1	J	mg/kg	174	2.74	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.74	0.274	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Vanadium, Total	32.5		mg/kg	0.868	0.176	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB
Zinc, Total	378		mg/kg	4.34	0.254	2	12/21/17 22:23	12/22/17 18:17	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04 Date Collected: 12/14/17 09:50

Client ID: SB006 (7.5-9.5) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	10600		mg/kg	8.99	2.43	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Antimony, Total	0.387	J	mg/kg	4.50	0.342	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Arsenic, Total	1.79		mg/kg	0.899	0.187	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Barium, Total	76.6		mg/kg	0.899	0.156	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Beryllium, Total	0.683		mg/kg	0.450	0.030	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Cadmium, Total	0.126	J	mg/kg	0.899	0.088	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Calcium, Total	1520		mg/kg	8.99	3.15	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Chromium, Total	25.8		mg/kg	0.899	0.086	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Cobalt, Total	11.7		mg/kg	1.80	0.149	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Copper, Total	22.8		mg/kg	0.899	0.232	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Iron, Total	21300		mg/kg	4.50	0.812	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Lead, Total	9.41		mg/kg	4.50	0.241	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Magnesium, Total	4580		mg/kg	8.99	1.38	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Manganese, Total	552		mg/kg	0.899	0.143	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Mercury, Total	0.02	J	mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:09	EPA 7471B	1,7471B	EA
Nickel, Total	17.9		mg/kg	2.25	0.218	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Potassium, Total	1700		mg/kg	225	12.9	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Selenium, Total	0.558	J	mg/kg	1.80	0.232	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Silver, Total	ND		mg/kg	0.899	0.254	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Sodium, Total	59.3	J	mg/kg	180	2.83	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Thallium, Total	ND		mg/kg	1.80	0.283	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Vanadium, Total	35.1		mg/kg	0.899	0.182	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS
Zinc, Total	58.9		mg/kg	4.50	0.263	2	12/21/17 22:23	12/22/17 16:56	EPA 3050B	1,6010C	PS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05 Date Collected: 12/14/17 10:00

Client ID: SB007 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	4750		mg/kg	9.12	2.46	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Antimony, Total	6.50		mg/kg	4.56	0.346	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Arsenic, Total	19.6		mg/kg	0.912	0.190	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Barium, Total	160		mg/kg	0.912	0.159	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Beryllium, Total	1.50		mg/kg	0.456	0.030	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Cadmium, Total	10.7		mg/kg	0.912	0.089	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Calcium, Total	4000		mg/kg	9.12	3.19	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Chromium, Total	79.1		mg/kg	0.912	0.088	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Cobalt, Total	21.8		mg/kg	1.82	0.151	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Copper, Total	263		mg/kg	0.912	0.235	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Iron, Total	36300		mg/kg	4.56	0.823	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Lead, Total	385		mg/kg	4.56	0.244	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Magnesium, Total	1000		mg/kg	9.12	1.40	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Manganese, Total	255		mg/kg	0.912	0.145	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Mercury, Total	0.11		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:14	EPA 7471B	1,7471B	EA
Nickel, Total	109		mg/kg	2.28	0.221	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Potassium, Total	408		mg/kg	228	13.1	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Selenium, Total	2.42		mg/kg	1.82	0.235	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Silver, Total	ND		mg/kg	0.912	0.258	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Sodium, Total	217		mg/kg	182	2.87	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Thallium, Total	ND		mg/kg	1.82	0.287	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Vanadium, Total	24.3		mg/kg	0.912	0.185	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS
Zinc, Total	809		mg/kg	4.56	0.267	2	12/21/17 22:23	12/22/17 17:00	EPA 3050B	1,6010C	PS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06 Date Collected: 12/14/17 10:05

Client ID: SB007 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	9090		mg/kg	8.60	2.32	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Antimony, Total	ND		mg/kg	4.30	0.327	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Arsenic, Total	0.740	J	mg/kg	0.860	0.179	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Barium, Total	81.0		mg/kg	0.860	0.150	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Beryllium, Total	0.645		mg/kg	0.430	0.028	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Cadmium, Total	0.163	J	mg/kg	0.860	0.084	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Calcium, Total	1310		mg/kg	8.60	3.01	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Chromium, Total	23.9		mg/kg	0.860	0.083	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Cobalt, Total	13.7		mg/kg	1.72	0.143	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Copper, Total	22.7		mg/kg	0.860	0.222	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Iron, Total	20800		mg/kg	4.30	0.777	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Lead, Total	3.90	J	mg/kg	4.30	0.230	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Magnesium, Total	4220		mg/kg	8.60	1.32	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Manganese, Total	628		mg/kg	0.860	0.137	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Mercury, Total	ND		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:16	EPA 7471B	1,7471B	EA
Nickel, Total	18.6		mg/kg	2.15	0.208	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Potassium, Total	2160		mg/kg	215	12.4	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Selenium, Total	0.422	J	mg/kg	1.72	0.222	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Silver, Total	ND		mg/kg	0.860	0.243	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Sodium, Total	31.4	J	mg/kg	172	2.71	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Thallium, Total	ND		mg/kg	1.72	0.271	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Vanadium, Total	33.8		mg/kg	0.860	0.175	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS
Zinc, Total	50.5		mg/kg	4.30	0.252	2	12/21/17 22:23	12/22/17 17:05	EPA 3050B	1,6010C	PS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07 Date Collected: 12/14/17 10:25

Client ID: SB008 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 91%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	10200		mg/kg	8.66	2.34	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Antimony, Total	1.63	J	mg/kg	4.33	0.329	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Arsenic, Total	2.54		mg/kg	0.866	0.180	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Barium, Total	284		mg/kg	0.866	0.151	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Beryllium, Total	0.442		mg/kg	0.433	0.029	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Cadmium, Total	0.277	J	mg/kg	0.866	0.085	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Calcium, Total	3480		mg/kg	8.66	3.03	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Chromium, Total	21.1		mg/kg	0.866	0.083	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Cobalt, Total	8.11		mg/kg	1.73	0.144	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Copper, Total	40.5		mg/kg	0.866	0.223	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Iron, Total	14900		mg/kg	4.33	0.782	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Lead, Total	186		mg/kg	4.33	0.232	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Magnesium, Total	3350		mg/kg	8.66	1.33	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Manganese, Total	392		mg/kg	0.866	0.138	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Mercury, Total	0.06	J	mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:18	EPA 7471B	1,7471B	EA
Nickel, Total	14.4		mg/kg	2.16	0.210	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Potassium, Total	1270		mg/kg	216	12.5	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Selenium, Total	0.459	J	mg/kg	1.73	0.223	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.866	0.245	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Sodium, Total	36.9	J	mg/kg	173	2.73	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.73	0.273	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Vanadium, Total	27.4		mg/kg	0.866	0.176	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB
Zinc, Total	273		mg/kg	4.33	0.254	2	12/21/17 22:23	12/22/17 17:10	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08 Date Collected: 12/14/17 10:30

Client ID: SB008 (10-12) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	12200		mg/kg	8.94	2.42	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.47	0.340	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Arsenic, Total	0.680	J	mg/kg	0.894	0.186	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Barium, Total	58.8		mg/kg	0.894	0.156	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Beryllium, Total	0.814		mg/kg	0.447	0.030	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Cadmium, Total	0.125	J	mg/kg	0.894	0.088	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Calcium, Total	1100		mg/kg	8.94	3.13	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Chromium, Total	42.8		mg/kg	0.894	0.086	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Cobalt, Total	14.6		mg/kg	1.79	0.148	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Copper, Total	25.0		mg/kg	0.894	0.231	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Iron, Total	24900		mg/kg	4.47	0.808	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Lead, Total	4.28	J	mg/kg	4.47	0.240	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Magnesium, Total	4920		mg/kg	8.94	1.38	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Manganese, Total	631		mg/kg	0.894	0.142	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Mercury, Total	ND		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:20	EPA 7471B	1,7471B	EA
Nickel, Total	17.2		mg/kg	2.24	0.216	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Potassium, Total	1760		mg/kg	224	12.9	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Selenium, Total	0.572	J	mg/kg	1.79	0.231	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.894	0.253	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Sodium, Total	8.58	J	mg/kg	179	2.82	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.79	0.282	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Vanadium, Total	44.6		mg/kg	0.894	0.182	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB
Zinc, Total	68.2		mg/kg	4.47	0.262	2	12/21/17 22:23	12/22/17 17:14	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09 Date Collected: 12/14/17 10:50

Client ID: SB009 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	10100		mg/kg	8.89	2.40	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Antimony, Total	26.3	J	mg/kg	44.5	3.38	20	12/21/17 22:23	12/26/17 13:28	EPA 3050B	1,6010C	PS
Arsenic, Total	6.63		mg/kg	0.889	0.185	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Barium, Total	322		mg/kg	0.889	0.155	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Beryllium, Total	0.427	J	mg/kg	0.445	0.029	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Cadmium, Total	1.42		mg/kg	0.889	0.087	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Calcium, Total	8800		mg/kg	8.89	3.11	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Chromium, Total	26.1		mg/kg	0.889	0.085	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Cobalt, Total	7.82		mg/kg	1.78	0.148	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Copper, Total	120		mg/kg	0.889	0.229	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Iron, Total	18700		mg/kg	4.45	0.803	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Lead, Total	624		mg/kg	4.45	0.238	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Magnesium, Total	2860		mg/kg	8.89	1.37	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Manganese, Total	320		mg/kg	0.889	0.141	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Mercury, Total	1.1		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:21	EPA 7471B	1,7471B	EA
Nickel, Total	23.6		mg/kg	2.22	0.215	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Potassium, Total	944		mg/kg	222	12.8	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Selenium, Total	0.640	J	mg/kg	1.78	0.229	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Silver, Total	2.11		mg/kg	0.889	0.252	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Sodium, Total	30.4	J	mg/kg	178	2.80	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.78	0.280	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Vanadium, Total	29.3		mg/kg	0.889	0.180	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB
Zinc, Total	714		mg/kg	4.45	0.260	2	12/21/17 22:23	12/22/17 18:40	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10 Date Collected: 12/14/17 10:55

Client ID: SB009 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	10900		mg/kg	8.80	2.37	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Antimony, Total	0.387	J	mg/kg	4.40	0.334	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Arsenic, Total	0.686	J	mg/kg	0.880	0.183	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Barium, Total	67.0		mg/kg	0.880	0.153	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Beryllium, Total	0.378	J	mg/kg	0.440	0.029	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.880	0.086	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Calcium, Total	2680		mg/kg	8.80	3.08	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Chromium, Total	16.2		mg/kg	0.880	0.084	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Cobalt, Total	21.5		mg/kg	1.76	0.146	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Copper, Total	133		mg/kg	0.880	0.227	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Iron, Total	23100		mg/kg	4.40	0.794	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Lead, Total	6.85		mg/kg	4.40	0.236	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Magnesium, Total	14000		mg/kg	8.80	1.35	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Manganese, Total	408		mg/kg	0.880	0.140	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Mercury, Total	0.12		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:23	EPA 7471B	1,7471B	EA
Nickel, Total	85.6		mg/kg	2.20	0.213	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Potassium, Total	1300		mg/kg	220	12.7	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Selenium, Total	0.554	J	mg/kg	1.76	0.227	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.880	0.249	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Sodium, Total	307		mg/kg	176	2.77	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.76	0.277	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Vanadium, Total	27.8		mg/kg	0.880	0.178	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB
Zinc, Total	51.0		mg/kg	4.40	0.258	2	12/21/17 22:23	12/22/17 18:45	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11 Date Collected: 12/14/17 11:05

Client ID: SB010 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 80%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	19400		mg/kg	10.0	2.71	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Antimony, Total	9.39		mg/kg	5.02	0.382	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Arsenic, Total	4.96		mg/kg	1.00	0.209	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Barium, Total	650		mg/kg	1.00	0.175	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Beryllium, Total	15.8		mg/kg	0.502	0.033	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Cadmium, Total	6.53		mg/kg	1.00	0.099	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Calcium, Total	17000		mg/kg	10.0	3.52	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Chromium, Total	668		mg/kg	1.00	0.097	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Cobalt, Total	451		mg/kg	2.01	0.167	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Copper, Total	2160		mg/kg	1.00	0.259	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Iron, Total	111000		mg/kg	50.2	9.08	20	12/21/17 22:23	12/26/17 13:33	EPA 3050B	1,6010C	PS
Lead, Total	1770		mg/kg	5.02	0.269	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Magnesium, Total	4410		mg/kg	10.0	1.55	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Manganese, Total	641		mg/kg	1.00	0.160	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Mercury, Total	0.09		mg/kg	0.08	0.02	1	12/21/17 08:10	12/21/17 19:25	EPA 7471B	1,7471B	EA
Nickel, Total	1020		mg/kg	2.51	0.243	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Potassium, Total	1380		mg/kg	251	14.5	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Selenium, Total	9.68		mg/kg	2.01	0.259	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Silver, Total	1.02		mg/kg	1.00	0.284	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Sodium, Total	4600		mg/kg	201	3.16	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Thallium, Total	2.72		mg/kg	2.01	0.316	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Vanadium, Total	36.8		mg/kg	1.00	0.204	2	12/21/17 22:23	12/22/17 19:03	EPA 3050B	1,6010C	AB
Zinc, Total	8000		mg/kg	50.2	2.94	20	12/21/17 22:23	12/26/17 13:33	EPA 3050B	1,6010C	PS

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12 Date Collected: 12/14/17 11:10

Client ID: SB010 (7-9) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	12600		mg/kg	8.79	2.37	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.39	0.334	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Arsenic, Total	0.650	J	mg/kg	0.879	0.183	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Barium, Total	98.7		mg/kg	0.879	0.153	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Beryllium, Total	0.545		mg/kg	0.439	0.029	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.879	0.086	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Calcium, Total	1160		mg/kg	8.79	3.08	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Chromium, Total	29.9		mg/kg	0.879	0.084	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Cobalt, Total	17.7		mg/kg	1.76	0.146	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Copper, Total	39.7		mg/kg	0.879	0.227	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Iron, Total	21400		mg/kg	4.39	0.794	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Lead, Total	12.7		mg/kg	4.39	0.236	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Magnesium, Total	4840		mg/kg	8.79	1.35	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Manganese, Total	400		mg/kg	0.879	0.140	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Mercury, Total	ND		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:27	EPA 7471B	1,7471B	EA
Nickel, Total	21.9		mg/kg	2.20	0.213	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Potassium, Total	5270		mg/kg	220	12.6	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Selenium, Total	0.395	J	mg/kg	1.76	0.227	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.879	0.249	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Sodium, Total	42.8	J	mg/kg	176	2.77	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.76	0.277	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Vanadium, Total	38.6		mg/kg	0.879	0.178	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB
Zinc, Total	81.9		mg/kg	4.39	0.257	2	12/21/17 22:23	12/22/17 19:09	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13 Date Collected: 12/14/17 11:20

Client ID: SB011 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 89%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	19800		mg/kg	8.48	2.29	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Antimony, Total	9.42		mg/kg	4.24	0.322	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Arsenic, Total	9.34		mg/kg	0.848	0.176	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Barium, Total	418		mg/kg	0.848	0.147	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Beryllium, Total	5.46		mg/kg	0.424	0.028	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Cadmium, Total	4.79		mg/kg	0.848	0.083	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Calcium, Total	13300		mg/kg	8.48	2.97	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Chromium, Total	341		mg/kg	0.848	0.081	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Cobalt, Total	111		mg/kg	1.70	0.141	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Copper, Total	721		mg/kg	0.848	0.219	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Iron, Total	68100		mg/kg	42.4	7.65	20	12/21/17 22:23	12/26/17 13:37	EPA 3050B	1,6010C	PS
Lead, Total	986		mg/kg	4.24	0.227	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Magnesium, Total	3730		mg/kg	8.48	1.30	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Manganese, Total	358		mg/kg	0.848	0.135	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Mercury, Total	0.08		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:29	EPA 7471B	1,7471B	EA
Nickel, Total	341		mg/kg	2.12	0.205	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Potassium, Total	3820		mg/kg	212	12.2	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Selenium, Total	2.34		mg/kg	1.70	0.219	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.848	0.240	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Sodium, Total	1420		mg/kg	170	2.67	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Thallium, Total	0.695	J	mg/kg	1.70	0.267	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Vanadium, Total	39.6		mg/kg	0.848	0.172	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB
Zinc, Total	2110		mg/kg	4.24	0.248	2	12/21/17 22:23	12/22/17 19:13	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14 Date Collected: 12/14/17 11:25

Client ID: SB011 (5-7) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	11700		mg/kg	8.71	2.35	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.36	0.331	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Arsenic, Total	0.488	J	mg/kg	0.871	0.181	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Barium, Total	95.1		mg/kg	0.871	0.152	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Beryllium, Total	0.470		mg/kg	0.436	0.029	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.871	0.085	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Calcium, Total	1060		mg/kg	8.71	3.05	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Chromium, Total	20.5		mg/kg	0.871	0.084	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Cobalt, Total	12.7		mg/kg	1.74	0.145	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Copper, Total	26.5		mg/kg	0.871	0.225	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Iron, Total	18900		mg/kg	4.36	0.787	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Lead, Total	4.44		mg/kg	4.36	0.234	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Magnesium, Total	4890		mg/kg	8.71	1.34	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Manganese, Total	329		mg/kg	0.871	0.138	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Mercury, Total	ND		mg/kg	0.07	0.01	1	12/21/17 08:10	12/21/17 19:31	EPA 7471B	1,7471B	EA
Nickel, Total	18.8		mg/kg	2.18	0.211	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Potassium, Total	5660		mg/kg	218	12.5	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Selenium, Total	0.488	J	mg/kg	1.74	0.225	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.871	0.247	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Sodium, Total	23.8	J	mg/kg	174	2.74	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.74	0.274	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Vanadium, Total	34.1		mg/kg	0.871	0.177	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB
Zinc, Total	49.0		mg/kg	4.36	0.255	2	12/21/17 22:23	12/22/17 19:18	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15 Date Collected: 12/14/17 11:40

Client ID: SB012 (0-2) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 88%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	16600		mg/kg	8.75	2.36	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Antimony, Total	0.918	J	mg/kg	4.37	0.332	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Arsenic, Total	2.80		mg/kg	0.875	0.182	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Barium, Total	144		mg/kg	0.875	0.152	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Beryllium, Total	0.726		mg/kg	0.437	0.029	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Cadmium, Total	0.262	J	mg/kg	0.875	0.086	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Calcium, Total	3590		mg/kg	8.75	3.06	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Chromium, Total	25.1		mg/kg	0.875	0.084	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Cobalt, Total	9.12		mg/kg	1.75	0.145	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Copper, Total	24.4		mg/kg	0.875	0.226	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Iron, Total	17300		mg/kg	4.37	0.790	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Lead, Total	82.6		mg/kg	4.37	0.234	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Magnesium, Total	3790		mg/kg	8.75	1.35	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Manganese, Total	604		mg/kg	0.875	0.139	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Mercury, Total	0.24		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:36	EPA 7471B	1,7471B	EA
Nickel, Total	15.7		mg/kg	2.19	0.212	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Potassium, Total	972		mg/kg	219	12.6	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Selenium, Total	0.551	J	mg/kg	1.75	0.226	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.875	0.248	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Sodium, Total	85.4	J	mg/kg	175	2.76	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.75	0.276	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Vanadium, Total	33.5		mg/kg	0.875	0.178	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB
Zinc, Total	114		mg/kg	4.37	0.256	2	12/21/17 22:23	12/22/17 19:23	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16 Date Collected: 12/14/17 11:45

Client ID: SB012 (6-8) Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 92%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	23800		mg/kg	8.24	2.22	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Antimony, Total	ND		mg/kg	4.12	0.313	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Arsenic, Total	0.346	J	mg/kg	0.824	0.171	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Barium, Total	204		mg/kg	0.824	0.143	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Beryllium, Total	0.767		mg/kg	0.412	0.027	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Cadmium, Total	0.124	J	mg/kg	0.824	0.081	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Calcium, Total	2140		mg/kg	8.24	2.88	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Chromium, Total	36.7		mg/kg	0.824	0.079	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Cobalt, Total	28.6		mg/kg	1.65	0.137	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Copper, Total	57.1		mg/kg	0.824	0.213	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Iron, Total	32200		mg/kg	4.12	0.744	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Lead, Total	5.05		mg/kg	4.12	0.221	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Magnesium, Total	12200		mg/kg	8.24	1.27	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Manganese, Total	579		mg/kg	0.824	0.131	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Mercury, Total	ND		mg/kg	0.07	0.01	1	12/21/17 08:10	12/21/17 19:38	EPA 7471B	1,7471B	EA
Nickel, Total	50.2		mg/kg	2.06	0.200	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Potassium, Total	12100		mg/kg	206	11.9	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Selenium, Total	0.717	J	mg/kg	1.65	0.213	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.824	0.233	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Sodium, Total	168		mg/kg	165	2.60	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.65	0.260	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Vanadium, Total	60.6		mg/kg	0.824	0.167	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB
Zinc, Total	117		mg/kg	4.12	0.242	2	12/21/17 22:23	12/22/17 19:27	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17 Date Collected: 12/14/17 00:00

Client ID: DUP002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Soil

Percent Solids: 87%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	12700		mg/kg	8.97	2.42	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Antimony, Total	3.33	J	mg/kg	4.49	0.341	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Arsenic, Total	7.20		mg/kg	0.897	0.187	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Barium, Total	428		mg/kg	0.897	0.156	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Beryllium, Total	0.601		mg/kg	0.449	0.030	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Cadmium, Total	1.97		mg/kg	0.897	0.088	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Calcium, Total	7750		mg/kg	8.97	3.14	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Chromium, Total	37.1		mg/kg	0.897	0.086	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Cobalt, Total	12.8		mg/kg	1.79	0.149	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Copper, Total	119		mg/kg	0.897	0.231	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Iron, Total	29500		mg/kg	4.49	0.810	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Lead, Total	477		mg/kg	4.49	0.240	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Magnesium, Total	4300		mg/kg	8.97	1.38	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Manganese, Total	693		mg/kg	0.897	0.143	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Mercury, Total	0.56		mg/kg	0.07	0.02	1	12/21/17 08:10	12/21/17 19:40	EPA 7471B	1,7471B	EA
Nickel, Total	31.8		mg/kg	2.24	0.217	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Potassium, Total	2850		mg/kg	224	12.9	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Selenium, Total	1.02	J	mg/kg	1.79	0.231	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Silver, Total	ND		mg/kg	0.897	0.254	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Sodium, Total	122	J	mg/kg	179	2.83	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Thallium, Total	ND		mg/kg	1.79	0.283	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Vanadium, Total	38.1		mg/kg	0.897	0.182	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB
Zinc, Total	662		mg/kg	4.49	0.263	2	12/21/17 22:23	12/22/17 19:32	EPA 3050B	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-18 Date Collected: 12/14/17 12:00

Client ID: FIELDBLANK002 Date Received: 12/14/17

Sample Location: 718 E. 212TH STREET, BRONX, NY Field Prep: Not Specified

Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Total Metals - Mansfield Lab											
Aluminum, Total	ND		mg/l	0.100	0.032	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Antimony, Total	ND		mg/l	0.050	0.007	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Arsenic, Total	ND		mg/l	0.005	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Barium, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Beryllium, Total	ND		mg/l	0.005	0.001	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Cadmium, Total	ND		mg/l	0.005	0.001	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Calcium, Total	ND		mg/l	0.100	0.035	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Chromium, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Cobalt, Total	ND		mg/l	0.020	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Copper, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Iron, Total	ND		mg/l	0.050	0.009	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Lead, Total	ND		mg/l	0.010	0.003	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Magnesium, Total	ND		mg/l	0.100	0.015	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Manganese, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Mercury, Total	ND		mg/l	0.00020	0.00006	1	12/20/17 16:39	12/21/17 21:59	EPA 7470A	1,7470A	EA
Nickel, Total	ND		mg/l	0.025	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Potassium, Total	ND		mg/l	2.50	0.237	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Selenium, Total	ND		mg/l	0.010	0.004	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Silver, Total	ND		mg/l	0.007	0.003	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Sodium, Total	ND		mg/l	2.00	0.120	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Thallium, Total	ND		mg/l	0.020	0.003	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Vanadium, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB
Zinc, Total	ND		mg/l	0.050	0.002	1	12/21/17 15:45	12/22/17 16:47	EPA 3005A	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 18 Batch: WG1075054-1										
Mercury, Total	ND		mg/l	0.00020	0.00006	1	12/20/17 16:39	12/21/17 21:50	1,7470A	EA

Prep Information

Digestion Method: EPA 7470A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-17 Batch: WG1075214-1										
Mercury, Total	ND		mg/kg	0.08	0.02	1	12/21/17 08:10	12/21/17 18:52	1,7471B	EA

Prep Information

Digestion Method: EPA 7471B

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 18 Batch: WG1075504-1										
Aluminum, Total	ND		mg/l	0.100	0.032	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Antimony, Total	ND		mg/l	0.050	0.007	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Arsenic, Total	ND		mg/l	0.005	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Barium, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Beryllium, Total	ND		mg/l	0.005	0.001	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Cadmium, Total	ND		mg/l	0.005	0.001	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Calcium, Total	ND		mg/l	0.100	0.035	1	12/21/17 15:45	12/22/17 16:43	1,6010C	AB
Chromium, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Cobalt, Total	ND		mg/l	0.020	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Copper, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Iron, Total	ND		mg/l	0.050	0.009	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Lead, Total	ND		mg/l	0.010	0.003	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Magnesium, Total	ND		mg/l	0.100	0.015	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Manganese, Total	ND		mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Nickel, Total	ND		mg/l	0.025	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Potassium, Total	ND		mg/l	2.50	0.237	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB

Project Name: BBU1702 **Lab Number:** L1746315

Project Number: BBU1702 **Report Date:** 12/26/17

Method Blank Analysis
Batch Quality Control

Selenium, Total	ND	mg/l	0.010	0.004	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Silver, Total	ND	mg/l	0.007	0.003	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Sodium, Total	ND	mg/l	2.00	0.120	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Thallium, Total	ND	mg/l	0.020	0.003	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Vanadium, Total	ND	mg/l	0.010	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB
Zinc, Total	ND	mg/l	0.050	0.002	1	12/21/17 15:45	12/22/17 14:54	1,6010C	AB

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Total Metals - Mansfield Lab for sample(s): 01-17 Batch: WG1075583-1										
Aluminum, Total	ND		mg/kg	4.00	1.08	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Antimony, Total	ND		mg/kg	2.00	0.152	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Arsenic, Total	ND		mg/kg	0.400	0.083	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Barium, Total	ND		mg/kg	0.400	0.070	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Beryllium, Total	ND		mg/kg	0.200	0.013	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Cadmium, Total	ND		mg/kg	0.400	0.039	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Calcium, Total	ND		mg/kg	4.00	1.40	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Chromium, Total	ND		mg/kg	0.400	0.038	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Cobalt, Total	ND		mg/kg	0.800	0.066	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Copper, Total	ND		mg/kg	0.400	0.103	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Iron, Total	ND		mg/kg	2.00	0.361	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Lead, Total	ND		mg/kg	2.00	0.107	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Magnesium, Total	ND		mg/kg	4.00	0.616	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Manganese, Total	ND		mg/kg	0.400	0.064	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Nickel, Total	ND		mg/kg	1.00	0.097	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Potassium, Total	ND		mg/kg	100	5.76	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Selenium, Total	ND		mg/kg	0.800	0.103	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Silver, Total	ND		mg/kg	0.400	0.113	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Sodium, Total	ND		mg/kg	80.0	1.26	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Thallium, Total	ND		mg/kg	0.800	0.126	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Vanadium, Total	ND		mg/kg	0.400	0.081	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB
Zinc, Total	ND		mg/kg	2.00	0.117	1	12/21/17 22:23	12/22/17 18:07	1,6010C	AB

Project Name: BBU1702
Project Number: BBU1702
Lab Number: L1746315
Report Date: 12/26/17

Method Blank Analysis
Batch Quality Control

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 18 Batch: WG1075054-2								
Mercury, Total	103		-		80-120	-		
Total Metals - Mansfield Lab Associated sample(s): 01-17 Batch: WG1075214-2 SRM Lot Number: D098-540								
Mercury, Total	117		-		50-149	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 18 Batch: WG1075504-2					
Aluminum, Total	102	-	80-120	-	
Antimony, Total	99	-	80-120	-	
Arsenic, Total	103	-	80-120	-	
Barium, Total	98	-	80-120	-	
Beryllium, Total	101	-	80-120	-	
Cadmium, Total	100	-	80-120	-	
Calcium, Total	99	-	80-120	-	
Chromium, Total	98	-	80-120	-	
Cobalt, Total	97	-	80-120	-	
Copper, Total	94	-	80-120	-	
Iron, Total	96	-	80-120	-	
Lead, Total	103	-	80-120	-	
Magnesium, Total	100	-	80-120	-	
Manganese, Total	96	-	80-120	-	
Nickel, Total	97	-	80-120	-	
Potassium, Total	95	-	80-120	-	
Selenium, Total	106	-	80-120	-	
Silver, Total	99	-	80-120	-	
Sodium, Total	96	-	80-120	-	
Thallium, Total	98	-	80-120	-	
Vanadium, Total	98	-	80-120	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 18 Batch: WG1075504-2					
Zinc, Total	102	-	80-120	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-17 Batch: WG1075583-2 SRM Lot Number: D098-540					
Aluminum, Total	74	-	47-153	-	
Antimony, Total	158	-	6-194	-	
Arsenic, Total	99	-	83-117	-	
Barium, Total	95	-	82-118	-	
Beryllium, Total	91	-	83-117	-	
Cadmium, Total	92	-	82-117	-	
Calcium, Total	86	-	81-118	-	
Chromium, Total	94	-	83-119	-	
Cobalt, Total	92	-	84-116	-	
Copper, Total	96	-	84-116	-	
Iron, Total	86	-	60-140	-	
Lead, Total	91	-	82-117	-	
Magnesium, Total	85	-	76-124	-	
Manganese, Total	90	-	82-118	-	
Nickel, Total	91	-	82-117	-	
Potassium, Total	85	-	69-131	-	
Selenium, Total	100	-	78-121	-	
Silver, Total	100	-	80-120	-	
Sodium, Total	88	-	74-126	-	
Thallium, Total	93	-	80-119	-	
Vanadium, Total	97	-	79-121	-	

Lab Control Sample Analysis

Batch Quality Control

Project Name: BBU1702

Project Number: BBU1702

Lab Number: L1746315

Report Date: 12/26/17

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-17 Batch: WG1075583-2 SRM Lot Number: D098-540					
Zinc, Total	92	-	81-119	-	

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 18 QC Batch ID: WG1075054-3 QC Sample: L1746804-02 Client ID: MS Sample												
Mercury, Total	ND	0.005	0.00224	**45**	Q	-	-		75-125	-		20
Total Metals - Mansfield Lab Associated sample(s): 01-17 QC Batch ID: WG1075214-3 WG1075214-4 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
Mercury, Total	0.45	0.145	0.68	**159**	Q	0.59	95		80-120	14		20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery		MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 18 QC Batch ID: WG1075504-3 QC Sample: L1746277-01 Client ID: MS Sample										
Aluminum, Total	ND	2	2.08	104		-	-	75-125	-	20
Antimony, Total	ND	0.5	0.512	102		-	-	75-125	-	20
Arsenic, Total	ND	0.12	0.127	106		-	-	75-125	-	20
Barium, Total	0.002J	2	2.01	100		-	-	75-125	-	20
Beryllium, Total	ND	0.05	0.052	104		-	-	75-125	-	20
Cadmium, Total	ND	0.051	0.053	103		-	-	75-125	-	20
Calcium, Total	0.561	10	10.3	97		-	-	75-125	-	20
Chromium, Total	0.057	0.2	0.201	**72**	Q	-	-	75-125	-	20
Cobalt, Total	0.002J	0.5	0.498	100		-	-	75-125	-	20
Copper, Total	0.195	0.25	0.277	**33**	Q	-	-	75-125	-	20
Iron, Total	0.201	1	1.06	86		-	-	75-125	-	20
Lead, Total	0.004J	0.51	0.538	105		-	-	75-125	-	20
Magnesium, Total	0.027J	10	10.2	102		-	-	75-125	-	20
Manganese, Total	0.007J	0.5	0.493	99		-	-	75-125	-	20
Nickel, Total	0.177	0.5	0.646	94		-	-	75-125	-	20
Potassium, Total	ND	10	9.67	97		-	-	75-125	-	20
Selenium, Total	ND	0.12	0.131	109		-	-	75-125	-	20
Silver, Total	ND	0.05	0.050	100		-	-	75-125	-	20
Sodium, Total	146.	10	10.7	**0**	Q	-	-	75-125	-	20
Thallium, Total	ND	0.12	0.122	102		-	-	75-125	-	20
Vanadium, Total	ND	0.5	0.497	99		-	-	75-125	-	20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	MSD Found	MSD %Recovery	Recovery Limits	RPD	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 18 QC Batch ID: WG1075504-3 QC Sample: L1746277-01 Client ID: MS Sample									
Zinc, Total	0.007J	0.5	0.535	107	-	-	75-125	-	20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery		MSD Found	MSD %Recovery		Recovery Limits	RPD		RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-17 QC Batch ID: WG1075583-3 WG1075583-4 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
Aluminum, Total	10800	180	11800	**557**	Q	8200	**0**	Q	75-125	**36**	Q	20
Antimony, Total	2.29J	44.9	37.4	83		38.4	84		75-125	3		20
Arsenic, Total	5.22	10.8	14.2	83		13.4	**74**	Q	75-125	6		20
Barium, Total	225.	180	410	103		344	**65**	Q	75-125	18		20
Beryllium, Total	0.486	4.49	4.04	79		3.96	76		75-125	2		20
Cadmium, Total	0.799J	4.58	4.32	94		4.21	90		75-125	3		20
Calcium, Total	2790	898	5250	**274**	Q	4680	**207**	Q	75-125	11		20
Chromium, Total	24.9	18	39.4	81		31.2	**34**	Q	75-125	**23**	Q	20
Cobalt, Total	8.17	44.9	42.1	76		41.4	**73**	Q	75-125	2		20
Copper, Total	84.5	22.4	95.6	**49**	Q	135	**221**	Q	75-125	**34**	Q	20
Iron, Total	20800	89.8	18500	**0**	Q	13700	**0**	Q	75-125	**30**	Q	20
Lead, Total	420.	45.8	919	**1090**	Q	419	**0**	Q	75-125	**75**	Q	20
Magnesium, Total	2910	898	3870	107		3040	**14**	Q	75-125	**24**	Q	20
Manganese, Total	681.	44.9	386	**0**	Q	316	**0**	Q	75-125	20		20
Nickel, Total	15.0	44.9	49.5	77		48.0	**72**	Q	75-125	3		20
Potassium, Total	1050	898	2000	106		1900	93		75-125	5		20
Selenium, Total	1.02J	10.8	9.60	89		9.77	89		75-125	2		20
Silver, Total	ND	26.9	24.6	91		24.6	90		75-125	0		20
Sodium, Total	38.1J	898	911	101		892	98		75-125	2		20
Thallium, Total	ND	10.8	7.72	**72**	Q	8.30	76		75-125	7		20
Vanadium, Total	32.5	44.9	68.0	79		61.1	**62**	Q	75-125	11		20

Matrix Spike Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	MS Added	MS Found	MS %Recovery		MSD Found	MSD %Recovery		Recovery Limits	RPD		RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 01-17 QC Batch ID: WG1075583-3 WG1075583-4 QC Sample: L1746315-03 Client ID: SB006 (0-2)												
Zinc, Total	378.	44.9	432	120		304	**0**	Q	75-125	**35**	Q	20

Lab Duplicate Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Total Metals - Mansfield Lab Associated sample(s): 18 QC Batch ID: WG1075054-4 QC Sample: L1746804-02 Client ID: DUP Sample						
Mercury, Total	ND	ND	mg/l	NC		20
Total Metals - Mansfield Lab Associated sample(s): 18 QC Batch ID: WG1075504-4 QC Sample: L1746277-01 Client ID: DUP Sample						
Arsenic, Total	ND	ND	mg/l	NC		20
Barium, Total	0.002J	0.002J	mg/l	NC		20
Cadmium, Total	ND	ND	mg/l	NC		20
Chromium, Total	0.057	0.004J	mg/l	NC		20
Lead, Total	0.004J	ND	mg/l	NC		20
Selenium, Total	ND	ND	mg/l	NC		20
Silver, Total	ND	ND	mg/l	NC		20

INORGANICS
&
MISCELLANEOUS

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-01
Client ID: SB005 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 09:30
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.0		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-02
Client ID: SB005 (3-5)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 09:35
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	83.8		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-03
Client ID: SB006 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 09:45
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.5		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-04
Client ID: SB006 (7.5-9.5)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 09:50
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.4		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-05
Client ID: SB007 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 10:00
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.3		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-06
Client ID: SB007 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 10:05
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.6		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-07
Client ID: SB008 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 10:25
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	90.8		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-08
Client ID: SB008 (10-12)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 10:30
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.8		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-09
Client ID: SB009 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 10:50
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.3		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-10
Client ID: SB009 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 10:55
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.2		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-11
Client ID: SB010 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 11:05
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	79.6		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-12
Client ID: SB010 (7-9)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 11:10
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.9		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-13
Client ID: SB011 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 11:20
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.9		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-14
Client ID: SB011 (5-7)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 11:25
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	91.8		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-15
Client ID: SB012 (0-2)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 11:40
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	88.0		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-16
Client ID: SB012 (6-8)
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 11:45
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	92.1		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

SAMPLE RESULTS

Lab ID: L1746315-17
Client ID: DUP002
Sample Location: 718 E. 212TH STREET, BRONX, NY
Matrix: Soil

Date Collected: 12/14/17 00:00
Date Received: 12/14/17
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total	86.8		%	0.100	NA	1	-	12/20/17 12:53	121,2540G	RI

Lab Duplicate Analysis
Batch Quality Control

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-17 QC Batch ID: WG1074892-1 QC Sample: L1746315-03 Client ID: SB006 (0-2)						
Solids, Total	86.5	86.0	%	1		20

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-01A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-01B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-01C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-01D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-01E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-01F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-02A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-02B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-02C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-02D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-02E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-02F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-03A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-03A1	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-03A2	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-03B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-03B1	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-03B2	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-03C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-03C1	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-03C2	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-03D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-03D1	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-03D2	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-03E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-03E1	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-03E2	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-03F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-03F1	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-03F2	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-04A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-04B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-04C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-04D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-04E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-04F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-05A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-05B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-05C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-05D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-05E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-05F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-06A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-06B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-06C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-06D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-06E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-06F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-07A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260H(14),NYTCL-8260HLW(14)
L1746315-07B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260H(14),NYTCL-8260HLW(14)
L1746315-07C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260H(14),NYTCL-8260HLW(14)
L1746315-07D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-07E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-07F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-08A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-08B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-08C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-08D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-08E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-08F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-09A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-09B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-09C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-09D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)
L1746315-09E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-09F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-10A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-10B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-10C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-10D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-10E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-10F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-11A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-11B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-11C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-11D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)
L1746315-11E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-11F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-12A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-12B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-12C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-12D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)
L1746315-12E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-12F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-13A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-13B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-13C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-13D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-13E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-13F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-14A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-14B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-14C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-14D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)
L1746315-14E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-14F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-15A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-15B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-15C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-15D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)
L1746315-15E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-15F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-16A	Vial MeOH preserved	B	NA		4.2	Y	Absent		NYTCL-8260HLW(14)
L1746315-16B	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-16C	Vial water preserved	B	NA		4.2	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-16D	Plastic 2oz unpreserved for TS	B	NA		4.2	Y	Absent		TS(7)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-16E	Metals Only-Glass 60mL/2oz unpreserved	B	NA		4.2	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-16F	Glass 250ml/8oz unpreserved	B	NA		4.2	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-17A	Vial MeOH preserved	C	NA		2.7	Y	Absent		NYTCL-8260HLW(14)
L1746315-17B	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-17C	Vial water preserved	C	NA		2.7	Y	Absent	15-DEC-17 08:53	NYTCL-8260HLW(14)
L1746315-17D	Plastic 2oz unpreserved for TS	C	NA		2.7	Y	Absent		TS(7)
L1746315-17E	Metals Only-Glass 60mL/2oz unpreserved	C	NA		2.7	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-17F	Glass 250ml/8oz unpreserved	C	NA		2.7	Y	Absent		NYTCL-8270(14),NYTCL-8081(14),NYTCL-8082(14)
L1746315-18A	Plastic 250ml HNO3 preserved	A	<2	<2	3.6	Y	Absent		BE-TI(180),AS-TI(180),BA-TI(180),AG-TI(180),AL-TI(180),CR-TI(180),NI-TI(180),TL-TI(180),CU-TI(180),PB-TI(180),SB-TI(180),SE-TI(180),ZN-TI(180),CO-TI(180),V-TI(180),FE-TI(180),HG-T(28),MG-TI(180),MN-TI(180),CA-TI(180),CD-TI(180),K-TI(180),NA-TI(180)
L1746315-18B	Plastic 250ml unpreserved	A	7	7	3.6	Y	Absent		HOLD-METAL(180)
L1746315-18C	Amber 500ml unpreserved	A	7	7	3.6	Y	Absent		NYTCL-8081(7)
L1746315-18D	Amber 500ml unpreserved	A	7	7	3.6	Y	Absent		NYTCL-8081(7)
L1746315-18E	Amber 1000ml unpreserved	A	7	7	3.6	Y	Absent		NYTCL-8082-1200ML(7)
L1746315-18F	Amber 1000ml unpreserved	A	7	7	3.6	Y	Absent		NYTCL-8082-1200ML(7)
L1746315-18G	Amber 1000ml unpreserved	A	7	7	3.6	Y	Absent		NYTCL-8270(7)
L1746315-18H	Amber 1000ml unpreserved	A	7	7	3.6	Y	Absent		NYTCL-8270(7)
L1746315-18I	Vial HCl preserved	A	NA		3.6	Y	Absent		NYTCL-8260(14)
L1746315-18J	Vial HCl preserved	A	NA		3.6	Y	Absent		NYTCL-8260(14)
L1746315-18K	Vial HCl preserved	A	NA		3.6	Y	Absent		NYTCL-8260(14)
L1746315-18X	Plastic 250ml HNO3 preserved Filtrates	A	NA		3.6	Y	Absent		HOLD-METAL(180)

*Values in parentheses indicate holding time in days

Project Name: BBU1702
Project Number: BBU1702

Lab Number: L1746315
Report Date: 12/26/17

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1746315-19A	Vial HCl preserved	A	NA		3.6	Y	Absent		NYTCL-8260(14)
L1746315-19B	Vial HCl preserved	A	NA		3.6	Y	Absent		NYTCL-8260(14)

*Values in parentheses indicate holding time in days

Project Name:	BBU1702	**Lab Number:**	L1746315
Project Number:	BBU1702	**Report Date:**	12/26/17

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

1	- The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

A	- Spectra identified as "Aldol Condensation Product".
B	- The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related

Report Format: DU Report with 'J' Qualifiers

Project Name:	BBU1702	**Lab Number:**	L1746315
Project Number:	BBU1702	**Report Date:**	12/26/17

Data Qualifiers

projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).

C - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.

D - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.

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

G - The concentration may be biased high due to matrix interferences (i.e, co-elution) with non-target compound(s). The result should be considered estimated.

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

I - The lower value for the two columns has been reported due to obvious interference.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

NJ - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.

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

Q - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

R - Analytical results are from sample re-analysis.

RE - Analytical results are from sample re-extraction.

S - Analytical results are from modified screening analysis.

J - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

Report Format: DU Report with 'J' Qualifiers

Project Name:	BBU1702	**Lab Number:**	L1746315
Project Number:	BBU1702	**Report Date:**	12/26/17

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - IV, 2007.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.

Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility
EPA 624: m/p-xylene, o-xylene
EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
EPA 300: DW: Bromide
EPA 6860: NPW and SCM: Perchlorate
EPA 9010: NPW and SCM: Amenable Cyanide Distillation
EPA 9012B: NPW: Total Cyanide
EPA 9050A: NPW: Specific Conductance
SM3500: NPW: Ferrous Iron
SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO2, NO3.
SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility
SM 2540D: TSS
EPA 3005A NPW
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water
EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **SM4500NO3-F, EPA 353.2**: Nitrate-N**, EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**
EPA 624: Volatile Halocarbons & Aromatics,
EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs
EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

Drinking Water
EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1** Hg.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.
EPA 245.1 Hg.
SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

NEW YORK CHAIN OF CUSTODY

ALPHA

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page 1 of 3

Date Rec'd in Lab: 12/15/17

ALPHA Job #: L1716315

Client Information
Client: PWGC
Address: 630 Johnson Ave
Bohemia, NY 11716
Phone: 631-589-6353
Fax:
Email: thomasm@pwgrosser.com

Project Information
Project Name:
Project Location: 718 E. 212th Street, Bronx, NY
Project # BBU1702
(Use Project name as Project #) [X]
Project Manager: Thomas Melia
ALPHAQuote #:

Turn-Around Time
Standard [X] Due Date:
Rush (only if pre approved) [ ] # of Days:

Deliverables
[X] ASP-A [ ] ASP-B
[ ] EQuIS (1 File) [ ] EQuIS (4 File)
[ ] Other

Regulatory Requirement
[ ] NY TOGS [ ] NY Part 375
[ ] AWQ Standards [ ] NY CP-51
[ ] NY Restricted Use [ ] Other
[ ] NY Unrestricted Use
[ ] NYC Sewer Discharge

Billing Information
[X] Same as Client Info
PO #

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
[ ] NJ [ ] NY
[ ] Other:

These samples have been previously analyzed by Alpha [ ]

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS
Sample Filtration
[ ] Done
[ ] Lab to do
Preservation
[ ] Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOC (8260)	SVOC (8270)	Pesticides (8081)	PCBs (8082)	TAL Metals (6010/7471)	Sample Specific Comments	Total Bottle
16315-01	SB005 (0-2)	12-14-17	0930	S	KC	X	X	X	X	X		6
02	SB005 (3-5)	"	0935	"	"	"	"	"	"	"		"
03	SB006 (0-2)	"	0945	"	"	"	"	"	"	"		"
03	SB006 (0-2) MS	"	"	"	"	"	"	"	"	"		"
03	SB006 (0-2) MSD	"	"	"	"	"	"	"	"	"		"
04	SB006 (7.5-9.5)	"	0950	"	"	"	"	"	"	"		"
05	SB007 (0-2)	"	1000	"	"	"	"	"	"	"		"
06	SB007 (7-9)	"	1005	"	"	"	"	"	"	"		"
07	SB008 (0-2)	"	1025	"	"	"	"	"	"	"		"
08	SB008 (10-12)	"	1030	"	"	"	"	"	"	"		"

Container Type: O A A A A
Preservative: O A A A A

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
		Kenneth Jackson AAL	12/14 1702
	12/14 2054		
	0300		12/15/17 0300

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

ALPHA ANALYTICAL

NEW YORK CHAIN OF CUSTODY

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
FAX: 508-898-9193

Mansfield, MA 02048
320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page: 2 of 3

Date Rec'd in Lab: 12/15/17

ALPHA Job #: L1716315

Client Information
Client: PWGC
Address: 630 Johnson Ave
Bohemia, NY 11716
Phone: 631-589-6353
Fax:
Email: thomasm@pwgrosser.com

Project Information
Project Name:
Project Location: 718 E. 212th St, Bronx, NY
Project # BBU1702
(Use Project name as Project #) ☒
Project Manager: Thomas Melia
ALPHAQuote #:

Turn-Around Time
Standard ☒ Due Date:
Rush (only if pre approved) ☐ # of Days:

Deliverables
☒ ASP-A ☐ ASP-B
☐ EQuIS (1 File) ☐ EQuIS (4 File)
☐ Other

Regulatory Requirement
☐ NY TOGS ☐ NY Part 375
☐ AWQ Standards ☐ NY CP-51
☐ NY Restricted Use ☐ Other
☐ NY Unrestricted Use
☐ NYC Sewer Discharge

Billing Information
☒ Same as Client Info
PO #

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
☐ NJ ☐ NY
☐ Other:

These samples have been previously analyzed by Alpha ☐

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
☐ Done
☐ Lab to do
Preservation
☐ Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOC (8260)	SVOC (8270)	Pesticides (8081)	PCBs (8082)	TAL Metals (6010 7471)	Sample Specific Comments	Total Bottle
46315-09	SB009 (0-2)	12-14-17	1050	S	KC	X	X	X	X	X		G
10	SB009 (7-9)		1055									
11	SB010 (0-2)		1105									
12	SB010 (7-9)		1110									
13	SB011 (0-2)		1120									
14	SB011 (5-7)		1125									
15	SB012 (0-2)		1140									
16	SB012 (6-8)		1145									
17	DUP002		XX									
18	Field Blank002		1200	WT								

Container Type: O A A A A
Preservative: O A A A A

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Relinquished By:	Date/Time	Received By:	Date/Time
		Pamela Jackson ADL	12/14 1702
	12/14 2054		2300
	12/15 0300		12/15/17 0300

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

NEW YORK CHAIN OF CUSTODY

ALPHA ANALYTICAL

Westborough, MA 01581
8 Walkup Dr.
TEL: 508-898-9220
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320 Forbes Blvd
TEL: 508-822-9300
FAX: 508-822-3288

Service Centers
Mahwah, NJ 07430: 35 Whitney Rd, Suite 5
Albany, NY 12205: 14 Walker Way
Tonawanda, NY 14150: 275 Cooper Ave, Suite 105

Page: 3 of 3

Date Rec'd in Lab: 12/15/17

ALPHA Job #: L1746315

Project Information
Project Name:
Project Location: 718 E. 212th St. Bronx, NY
Project #: BBU1702
(Use Project name as Project #): [X]
Project Manager: Thomas Melia
ALPHAQuote #:

Turn-Around Time
Standard: [X] Due Date:
Rush (only if pre approved): [ ] # of Days:

Deliverables
[X] ASP-A [ ] ASP-B
[ ] EQuIS (1 File) [ ] EQuIS (4 File)
[ ] Other

Billing Information
[X] Same as Client Info
PO #

Regulatory Requirement
[ ] NY TOGS [ ] NY Part 375
[ ] AWQ Standards [ ] NY CP-51
[ ] NY Restricted Use [ ] Other
[ ] NY Unrestricted Use
[ ] NYC Sewer Discharge

Disposal Site Information
Please identify below location of applicable disposal facilities.
Disposal Facility:
[ ] NJ [ ] NY
[ ] Other:

Client Information
Client: PWGC
Address: 630 Johnson Ave
Bohemia, NY 11716
Phone: 631-589-6353
Fax:
Email: thomas.mel@pwgrosser.com

These samples have been previously analyzed by Alpha [ ]

Other project specific requirements/comments:

Please specify Metals or TAL.

ANALYSIS

Sample Filtration
[ ] Done
[ ] Lab to do
Preservation
[ ] Lab to do
(Please Specify below)

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	VOC (8260)	Sample Specific Comments	Total Bottle
46315 19	Trip Blank	XX	XX	WT	XX	X		2

Preservative Code:
A = None
B = HCl
C = HNO_3
D = H_2SO_4
E = NaOH
F = MeOH
G = $NaHSO_4$
H = $Na_2S_2O_3$
K/E = Zn Ac/NaOH
O = Other

Container Code
P = Plastic
A = Amber Glass
V = Vial
G = Glass
B = Bacteria Cup
C = Cube
O = Other
E = Encore
D = BOD Bottle

Westboro: Certification No: MA935
Mansfield: Certification No: MA015

Container Type	A											
Preservative	V											

Relinquished By:	Date/Time	Received By:	Date/Time
		Kenneth Jackson AAL	12/14 1702
KH	12/14 2054		12/14 2340
12/15	0340		12/15/17 0300

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. BY EXECUTING THIS COC, THE CLIENT HAS READ AND AGREES TO BE BOUND BY ALPHA'S TERMS & CONDITIONS. (See reverse side.)

Form No: 01-25 HC (rev. 30-Sept-2013)

APPENDIX C
DATA USABILITY SUMMARY REPORT

PHONE: 631.589.6353
PWGROSSER.COM
630 JOHNSON AVENUE, STE 7
BOHEMIA, NY 11716

LABORATORY DATA CONSULTANTS, INC.
2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

P.W. Grosser Consulting
630 Johnson Ave, Suite 7
Bohemia, NY 11716
ATTN: Mr. Thomas Melia

September 21, 2018

SUBJECT: Williamsbridge Gardens, Data Usability Summary Report

Dear Mr. Melia,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on September 7, 2018. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project #43079:

SDG #	Fraction
L1745804, L1745989 L1746315	Volatiles, Semivolatiles, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals

The data validation was performed under modified Category B guidelines using quality control summaries provided by the laboratory. The analyses were validated using the following documents, as applicable to each method:

- USEPA Region 2 Standard Operating Procedure for Validating Volatile Organic Compounds By Gas Chromatography/Mass Spectrometry, SOP HW-24, Revision 4; October 2014
- USEPA Region 2 Analysis of Volatile Organic Compounds in Air Contained Canisters, SOP HW-31, Revision 6; September 2016
- USEPA Region 2 Standard Operating Procedure for Semivolatile Data Validation, SOP HW-35A, Revision1; September 2016
- USEPA Region 2 Standard Operating Procedure for Validating Pesticide Compounds, Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B, SOP HW-44, Revision 1; October 2006
- USEPA Region 2 Standard Operating Procedure for Validating PCB Compounds, PCBs by Gas Chromatography SW-846 Method 8082A, SOP HW-45, Revision 1; October 2006
- USEPA Region 2 Standard Operating Procedure for the Evaluation of Metals for the Contract Laboratory Program, SOP HW-2a/c, Revision 15; December 2012
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data review, EPA 540-R-2017-002; January 2017
- USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review; EPA 540-R-2017-001; January 2017

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink

Christina Rink
Project Manager/Senior Chemist

14,333 pages-DL Validate 5% per SDG

Attachment 1

Category B

LDC #43079 (P.W. Grosser Consulting - Bohemia, NY / Williamsbridge)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (TO-15)		VOA (8260C)		SVOA (8270D)		Pest. (8081B)		PCBs (8082A)		Metals (6010C /7000)																					
Matrix:	Water/Soil			A	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	L1745804	09/07/18	09/28/18	-	-	0	1	0	1	0	1	0	1	0	1																				
B	L1745989	09/07/18	09/28/18	1	0	-	-	-	-	-	-	-	-	-	-																				
C	L1746315	09/07/18	09/28/18	-	-	0	1	0	1	0	1	0	1	0	1																				
Total	T/CR			1	0	0	2	0	2	0	2	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11

Shaded cells indicate Category B validation (all other cells are Category A validation). These sample counts do not include MS, MSD, or DUP's.

L:\PW Grosser\Williamsbridge\43079ST.wpd

Site: Williamsbridge Gardens
Laboratory: Alpha Analytical, Inc.
Report No.: L1745804
Reviewer: Felomina Tanguilig and Christina Rink/Laboratory Data Consultants for P.W. Grosser Consulting
Date: September 20, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
SB002 (7-9)	L1745804-04	VOC, SVOC, Pesticide, PCB
SB002 (7-9)MS	L1745804-04MS	VOC, SVOC, Pesticide, PCB
SB002 (7-9)MSD	L1745804-04MSD	VOC, SVOC, Pesticide, PCB

Associated QC Samples(s):
Field/Trip Blanks: Trip Blank, Field Blank 001
Field Duplicate pair: None Associated

The above-listed soil samples were collected on December 11, 2017 and were analyzed for volatile organic compounds (VOCs) by SW-846 method 8260C, semivolatile organic compounds (SVOCs) by SW-846 method 8270D, chlorinated pesticides by SW-846 method 8081B, and polychlorinated biphenyls (PCBs) by SW-846 method 8082A. The data validation was performed in accordance with the USEPA Region 2 *Standard Operating Procedure for Validating Volatile Organic Compounds By Gas Chromatography/Mass Spectrometry,* SOP HW-24, Revision 4 (October 2014), the USEPA Region 2 *Standard Operating Procedure for Semivolatile Data Validation,* SOP HW-35A, Revision 1 (September 2016), the USEPA Region 2 *Standard Operating Procedure for Validating Pesticide Compounds, Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B,* SOP HW-44, Revision 1 (October 2006), the USEPA Region 2 *Standard Operating Procedure for Validating PCB Compounds, PCBs by Gas Chromatography SW-846 Method 8082A,* SOP HW-45, Revision 1 (October 2006), and the USEPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review,* EPA 540-R-2017-002 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The organic data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tunes
- GC/Electron Capture Detector (GC/ECD) Instrument Performance Checks
- Initial and Continuing Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Moisture Content
- Field Duplicate Results
- Quantitation Limits and Data Assessment
- Sample Quantitation and Compound Identification

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers with the exception listed below.

The SVOC nondetect results for benzoic acid in sample SB002 (7-9) were rejected (R) due to severely low MS/MSD and LCS/LCSD percent recoveries. The results are not usable for project objectives, which may have a major impact on the data usability.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times and Sample Preservation

All technical holding time requirements were met.

GC/MS Tunes

VOC and SVOC

All criteria were met.

GC/ECD Instrument Performance Checks

Pesticide and PCB

All criteria were met.

Initial and Continuing Calibrations

VOC

Initial calibration:

Compounds that did not meet criteria are summarized in the following table.

Date	Instrument ID	Compound	RRF (Limits)	Associated Samples		Validation Action
12/19/17	ICAL-VOAIII-171229	1,4-Dioxane	0.002 (≥0.005)	SB002 (7-9)	+	UJ nondetects

X = Initial calibration (IC) relative standard deviation (%RSD) > 20; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 20; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The 1,4-dioxane result was estimated due to response factor exceedance. The bias cannot be determined. The result can be used for project objectives as a nondetect with an estimated quantitation limit (UJ) which may have a minor impact on the data usability.

Date	Instrument ID	Compound	ICV %D	Associated Samples		Validation Action
12/19/17	ICV-VOAIII	Dichlorodifluoromethane	34.1	SB002 (7-9)	SS	UJ nondetects

X = Initial calibration (IC) relative standard deviation (%RSD) > 20; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 20; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The dichlorodifluoromethane result was estimated due to second source verification exceedance. The bias cannot be determined. The result can be used for project objectives as a nondetect with an estimated quantitation limit (UJ) which may have a minor impact on the data usability.

Continuing calibration:

Compounds that did not meet criteria are summarized in the following table.

Date	Instrument ID	Compound	RRF (Limits)	Associated Samples		Validation Action
12/20/17	CCV-VOAIII	1,4-Dioxane	0.002 (≥0.005)	SB002 (7-9)	+	UJ nondetects

X = Initial calibration (IC) relative standard deviation (%RSD) > 20; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 20; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The 1,4-dioxane result was estimated due to response factor exceedance. The bias cannot be determined. The result can be used for project objectives as a nondetect with an estimated quantitation limit (UJ) which may have a minor impact on the data usability.

SVOC, Pesticide, and PCB

All criteria were met.

Blanks

VOC

Contamination was detected in the associated VOC method blank samples. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action Levels (ALs) were established at <2x RL (for common contaminants) and <RL (for other contaminants) of the concentrations detected. The following table summarizes the contamination detected.

Blank ID	Compound	Level Detected	Action Level	Associated Samples
WG1075119-5Blank	Bromomethane	2.7 ug/Kg	RL	SB002 (7-9)

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

No samples were qualified since the associated sample results were nondetect.

No positive results were found in the trip blank sample Trip Blank and field blank sample Field Blank 001 for VOC analysis.

SVOC, Pesticide, and PCB

Contamination was not detected in the method blanks.

No positive results were found in the field blank sample Field Blank 001 for SVOC, pesticide, and PCB analyses.

Surrogate Recoveries

All criteria were met.

MS/MSD Results

VOC

MS/MSD analyses were performed on sample SB002 (7-9) for VOC analysis. The following table lists the compounds recovered outside of control limits in the MS/MSD analyses and the resulting actions.

Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
Tetrachloroethene	-	67 (70-130)	-	SB002 (7-9)	UJ nondetects
Chlorobenzene	69 (70-130)	64 (70-130)	-		UJ nondetects
1,1,2,2-Tetrachloroethane	69 (70-130)	-	-		UJ nondetects
Ethylbenzene	-	62 (70-130)	-		UJ nondetects
Chloroethane	-	31 (50-151)	-		UJ nondetects
1,2-Dichlorobenzene	61 (70-130)	56 (70-130)	-		UJ nondetects
1,3-Dichlorobenzene	59 (70-130)	52 (70-130)	-		UJ nondetects
1,4-Dichlorobenzene	57 (70-130)	50 (70-130)	-		UJ nondetects
m,p-Xylene	69 (70-130)	60 (70-130)	-		UJ nondetects
o-Xylene	-	62 (70-130)	-		UJ nondetects
Styrene	68 (70-130)	62 (70-130)	-		UJ nondetects
Vinyl acetate	46 (70-130)	28 (70-130)	-		UJ nondetects
4-Methyl-2-pentanone	69 (70-130)	-	-		UJ nondetects
2-Hexanone	68 (70-130)	-	-		UJ nondetects
Bromobenzene	66 (70-130)	61 (70-130)	-		UJ nondetects
n-Butylbenzene	54 (70-130)	42 (70-130)	-		UJ nondetects
sec-Butylbenzene	64 (70-130)	51 (70-130)	-		UJ nondetects
tert-Butylbenzene	67 (70-130)	56 (70-130)	-		UJ nondetects
o-Chlorotoluene	64 (70-130)	54 (70-130)	-		UJ nondetects
p-Chlorotoluene	61 (70-130)	52 (70-130)	-		UJ nondetects
Hexachlorobutadiene	50 (67-130)	37 (67-130)	-		UJ nondetects
Isopropylbenzene	-	59 (70-130)	-		UJ nondetects
p-Isopropyltoluene	59 (70-130)	47 (70-130)	-		UJ nondetects
Naphthalene	60 (70-130)	62 (70-130)	-		UJ nondetects
Acrylonitrile	69 (70-130)	-	-		UJ nondetects
n-Propylbenzene	64 (70-130)	52 (70-130)	-		UJ nondetects
1,2,3-Trichlorobenzene	55 (70-130)	51 (70-130)	-		UJ nondetects
1,2,4-Trichlorobenzene	51 (70-130)	47 (70-130)	-		UJ nondetects
1,3,5-Trimethylbenzene	64 (70-130)	54 (70-130)	-		UJ nondetects
1,2,4-Trimethylbenzene	62 (70-130)	52 (70-130)	-		UJ nondetects
p-Diethylbenzene	54 (70-130)	43 (70-130)	-		UJ nondetects
p-Ethyltoluene	62 (70-130)	50 (70-130)	-		UJ nondetects
1,2,4,5-Tetramethylbenzene	56 (70-130)	48 (70-130)	-		UJ nondetects

Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
Chloroethane	-	-	99 (≤30)	SB002 (7-9)	None
Vinyl acetate	-	-	51 (≤30)		
Hexachlorobutadiene	-	-	33 (≤30)		

- Within control limits

The results listed above may be biased low due to low MS/MSD percent recoveries. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

Validation action was not required for chloroethane, vinyl acetate, and hexachlorobutadiene due to MS/MSD relative percent difference exceedances as positive results only are affected and these compounds were not detected in the associated sample.

SVOC

MS/MSD analyses were performed on sample SB002 (7-9) for SVOC analysis. The following table lists the compounds recovered outside of control limits in the MS/MSD analyses and the resulting actions.

Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
Pentachlorophenol	-	110 (17-109)	-	SB002 (7-9)	None
Benzoic acid	0 (10-110)	0 (10-110)	-	SB002 (7-9)	R nondetects

- Within control limits

Validation action was not required for pentachlorophenol due to high MS/MSD percent recovery as positive results only are affected and this compound was not detected in the associated sample.

The SVOC nondetect result for benzoic acid in sample SB002 (7-9) was rejected (R) due to low MS/MSD percent recovery. The result is not usable for project objectives, which may have a major impact on the data usability.

Pesticide and PCB

All criteria were met.

LCS Results

VOC, Pesticide, and PCB

All criteria were met.

SVOC

The following table lists the compounds recovered outside of control limits in the SVOC analysis and the resulting validation actions.

LCS ID	Compound	LCS %R (Limits)	LCS/D %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
WG1073744-2/3LCS/D	p-Chloro-m-cresol	105 (26-103)	-	-	SB002 (7-9)	None
WG1073744-2/3LCS/D	Benzoic acid	0 (10-110)	0 (10-110)	-	SB002 (7-9)	R nondetects

- Within control limits

Validation action was not required for p-chloro-m-cresol due to high LCS/LCSD percent recovery as positive results only are affected and this compound was not detected in the associated sample.

The SVOC nondetect result for benzoic acid in sample SB002 (7-9) was rejected (R) due to low LCS/LCSD percent recovery. The result is not usable for project objectives, which may have a major impact on the data usability.

Interal Standards

All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

Quantitation Limits and Data Assessment

Results were reported which were below the reporting limit (RL) and above the method detection limit (MDL) in the pesticide analysis. These results were qualified as estimated (J) by the laboratory.

No results were reported below the reporting limit (RL) and above the method detection limit (MDL) in the VOC, SVOC, and PCB analyses.

Dilutions were not required for VOC, SVOC, pesticide and PCB analyses.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

The following table lists the GC dual column RPDs for pesticide analysis which were outside the control limit of 40% and the resulting actions. The direction of the bias cannot be determined from this nonconformance. All results are usable as estimated values (J).

Sample	Compound	RPD (%)	Validation Actions
SB002 (7-9)	delta-BHC	92	J detects

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

Form 1
VOA

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 16:17
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,8260C	Analyst	: MKS
Lab File ID	: V11171220A23	Instrument ID	: VOA111
Sample Amount	: 5.0 g	GC Column	: RTX-VMS
Level	: LOW	%Solids	: 89
Extract Volume (MeOH)	: N/A	Injection Volume	: N/A

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier
75-09-2	Methylene chloride	ND	11	1.8	U
75-34-3	1,1-Dichloroethane	ND	1.7	0.30	U
67-66-3	Chloroform	ND	1.7	0.42	U
56-23-5	Carbon tetrachloride	ND	1.1	0.39	U
78-87-5	1,2-Dichloropropane	ND	3.9	0.26	U
124-48-1	Dibromochloromethane	ND	1.1	0.20	U
79-00-5	1,1,2-Trichloroethane	ND	1.7	0.35	U
127-18-4	Tetrachloroethene	ND	1.1	0.34	U
108-90-7	Chlorobenzene	ND	1.1	0.39	U
75-69-4	Trichlorofluoromethane	ND	5.6	0.47	U
107-06-2	1,2-Dichloroethane	ND	1.1	0.28	U
71-55-6	1,1,1-Trichloroethane	ND	1.1	0.39	U
75-27-4	Bromodichloromethane	ND	1.1	0.34	U
10061-02-6	trans-1,3-Dichloropropene	ND	1.1	0.23	U
10061-01-5	cis-1,3-Dichloropropene	ND	1.1	0.26	U
542-75-6	1,3-Dichloropropene, Total	ND	1.1	0.23	U
563-58-6	1,1-Dichloropropene	ND	5.6	0.37	U
75-25-2	Bromoform	ND	4.5	0.26	U
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.1	0.33	U
71-43-2	Benzene	ND	1.1	0.22	U
108-88-3	Toluene	ND	1.7	0.22	U
100-41-4	Ethylbenzene	ND	1.1	0.19	U
74-87-3	Chloromethane	ND	5.6	0.49	U
74-83-9	Bromomethane	ND	2.2	0.38	U
75-01-4	Vinyl chloride	ND	2.2	0.35	U
75-00-3	Chloroethane	ND	2.2	0.35	U
75-35-4	1,1-Dichloroethene	ND	1.1	0.42	U

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Form 1
VOA

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 16:17
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,8260C	Analyst	: MKS
Lab File ID	: V11171220A23	Instrument ID	: VOA111
Sample Amount	: 5.0 g	GC Column	: RTX-VMS
Level	: LOW	%Solids	: 89
Extract Volume (MeOH)	: N/A	Injection Volume	: N/A

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier
156-60-5	trans-1,2-Dichloroethene	ND	1.7	0.27	U U
79-01-6	Trichloroethene	ND	1.1	0.34	U U
95-50-1	1,2-Dichlorobenzene	ND	5.6	0.20	U UJ
541-73-1	1,3-Dichlorobenzene	ND	5.6	0.24	U UJ
106-46-7	1,4-Dichlorobenzene	ND	5.6	0.20	U UJ
1634-04-4	Methyl tert butyl ether	ND	2.2	0.17	U U
179601-23-1	p/m-Xylene	ND	2.2	0.39	U UJ
95-47-6	o-Xylene	ND	2.2	0.38	U UJ
1330-20-7	Xylenes, Total	ND	2.2	0.38	U U
156-59-2	cis-1,2-Dichloroethene	ND	1.1	0.38	U
540-59-0	1,2-Dichloroethene, Total	ND	1.1	0.27	U
74-95-3	Dibromomethane	ND	11	0.27	U
100-42-5	Styrene	ND	2.2	0.45	U UJ
75-71-8	Dichlorodifluoromethane	ND	11	0.56	U UJ
67-64-1	Acetone	ND	11	2.6	U U
75-15-0	Carbon disulfide	ND	11	1.2	U
78-93-3	2-Butanone	ND	11	0.77	U
108-05-4	Vinyl acetate	ND	11	0.17	U UJ
108-10-1	4-Methyl-2-pentanone	ND	11	0.27	U UJ
96-18-4	1,2,3-Trichloropropane	ND	11	0.20	U U
591-78-6	2-Hexanone	ND	11	0.75	U UJ
74-97-5	Bromochloromethane	ND	5.6	0.40	U U
594-20-7	2,2-Dichloropropane	ND	5.6	0.50	U
106-93-4	1,2-Dibromoethane	ND	4.5	0.22	U
142-28-9	1,3-Dichloropropane	ND	5.6	0.20	U
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.1	0.36	U
108-86-1	Bromobenzene	ND	5.6	0.24	U UJ

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Form 1
VOA

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 16:17
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,8260C	Analyst	: MKS
Lab File ID	: V11171220A23	Instrument ID	: VOA111
Sample Amount	: 5.0 g	GC Column	: RTX-VMS
Level	: LOW	%Solids	: 89
Extract Volume (MeOH)	: N/A	Injection Volume	: N/A

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier	
104-51-8	n-Butylbenzene	ND	1.1	0.26	U	UJ
135-98-8	sec-Butylbenzene	ND	1.1	0.24	U	UJ
98-06-6	tert-Butylbenzene	ND	5.6	0.28	U	UJ
95-49-8	o-Chlorotoluene	ND	5.6	0.25	U	UJ
106-43-4	p-Chlorotoluene	ND	5.6	0.20	U	UJ
96-12-8	1,2-Dibromo-3-chloropropane	ND	5.6	0.44	U	U
87-68-3	Hexachlorobutadiene	ND	5.6	0.39	U	UJ
98-82-8	Isopropylbenzene	ND	1.1	0.22	U	UJ
99-87-6	p-Isopropyltoluene	ND	1.1	0.23	U	UJ
91-20-3	Naphthalene	ND	5.6	0.15	U	UJ
107-13-1	Acrylonitrile	ND	11	0.58	U	UJ
103-65-1	n-Propylbenzene	ND	1.1	0.24	U	UJ
87-61-6	1,2,3-Trichlorobenzene	ND	5.6	0.28	U	UJ
120-82-1	1,2,4-Trichlorobenzene	ND	5.6	0.24	U	UJ
108-67-8	1,3,5-Trimethylbenzene	ND	5.6	0.18	U	UJ
95-63-6	1,2,4-Trimethylbenzene	ND	5.6	0.21	U	UJ
123-91-1	1,4-Dioxane	ND	45	16.	U	UJ
105-05-5	p-Diethylbenzene	ND	4.5	4.5	U	UJ
622-96-8	p-Ethyltoluene	ND	4.5	0.26	U	UJ
95-93-2	1,2,4,5-Tetramethylbenzene	ND	4.5	0.18	U	UJ
60-29-7	Ethyl ether	ND	5.6	0.29	U	U
110-57-6	trans-1,4-Dichloro-2-butene	ND	5.6	0.44	U	U

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Form 1
SemiVolatile Organics

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX,	Date Analyzed	: 12/19/17 17:41
Sample Matrix	: SOIL	Date Extracted	: 12/18/17
Analytical Method	: 1,8270D	Dilution Factor	: 1
Lab File ID	: 45804-04	Analyst	: EK
Sample Amount	: 30.16 g	Instrument ID	: SV112
Extraction Method	: EPA 3546	GC Column	: RTX5-MS
Extract Volume	: 1000 uL	%Solids	: 89
GPC Cleanup	: N	Injection Volume	: 1 uL

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier
83-32-9	Acenaphthene	ND	150	19.	U
120-82-1	1,2,4-Trichlorobenzene	ND	190	21.	U
118-74-1	Hexachlorobenzene	ND	110	21.	U
111-44-4	Bis(2-chloroethyl)ether	ND	170	25.	U
91-58-7	2-Chloronaphthalene	ND	190	18.	U
95-50-1	1,2-Dichlorobenzene	ND	190	33.	U
541-73-1	1,3-Dichlorobenzene	ND	190	32.	U
106-46-7	1,4-Dichlorobenzene	ND	190	32.	U
91-94-1	3,3'-Dichlorobenzidine	ND	190	49.	U
121-14-2	2,4-Dinitrotoluene	ND	190	37.	U
606-20-2	2,6-Dinitrotoluene	ND	190	32.	U
206-44-0	Fluoranthene	ND	110	21.	U
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	20.	U
101-55-3	4-Bromophenyl phenyl ether	ND	190	28.	U
108-60-1	Bis(2-chloroisopropyl)ether	ND	220	32.	U
111-91-1	Bis(2-chloroethoxy)methane	ND	200	19.	U
87-68-3	Hexachlorobutadiene	ND	190	27.	U
77-47-4	Hexachlorocyclopentadiene	ND	530	170	U
67-72-1	Hexachloroethane	ND	150	30.	U
78-59-1	Isophorone	ND	170	24.	U
91-20-3	Naphthalene	ND	190	23.	U
98-95-3	Nitrobenzene	ND	170	28.	U
86-30-6	NDPA/DPA	ND	150	21.	U
621-64-7	n-Nitrosodi-n-propylamine	ND	190	29.	U

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Initials: CR

Form 1
SemiVolatile Organics

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX,	Date Analyzed	: 12/19/17 17:41
Sample Matrix	: SOIL	Date Extracted	: 12/18/17
Analytical Method	: 1,8270D	Dilution Factor	: 1
Lab File ID	: 45804-04	Analyst	: EK
Sample Amount	: 30.16 g	Instrument ID	: SV112
Extraction Method	: EPA 3546	GC Column	: RTX5-MS
Extract Volume	: 1000 uL	%Solids	: 89
GPC Cleanup	: N	Injection Volume	: 1 uL

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier
117-81-7	Bis(2-ethylhexyl)phthalate	ND	190	64.	U
85-68-7	Butyl benzyl phthalate	ND	190	47.	U
84-74-2	Di-n-butylphthalate	ND	190	35.	U
117-84-0	Di-n-octylphthalate	ND	190	63.	U
84-66-2	Diethyl phthalate	ND	190	17.	U
131-11-3	Dimethyl phthalate	ND	190	39.	U
56-55-3	Benzo(a)anthracene	ND	110	21.	U
50-32-8	Benzo(a)pyrene	ND	150	45.	U
205-99-2	Benzo(b)fluoranthene	ND	110	31.	U
207-08-9	Benzo(k)fluoranthene	ND	110	30.	U
218-01-9	Chrysene	ND	110	19.	U
208-96-8	Acenaphthylene	ND	150	29.	U
120-12-7	Anthracene	ND	110	36.	U
191-24-2	Benzo(ghi)perylene	ND	150	22.	U
86-73-7	Fluorene	ND	190	18.	U
85-01-8	Phenanthrene	ND	110	23.	U
53-70-3	Dibenzo(a,h)anthracene	ND	110	22.	U
193-39-5	Indeno(1,2,3-cd)pyrene	ND	150	26.	U
129-00-0	Pyrene	ND	110	18.	U
92-52-4	Biphenyl	ND	420	43.	U
106-47-8	4-Chloroaniline	ND	190	34.	U
88-74-4	2-Nitroaniline	ND	190	36.	U
99-09-2	3-Nitroaniline	ND	190	35.	U
100-01-6	4-Nitroaniline	ND	190	77.	U

SEP 21 2018

Initials: CR

Form 1
SemiVolatile Organics

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX,	Date Analyzed	: 12/19/17 17:41
Sample Matrix	: SOIL	Date Extracted	: 12/18/17
Analytical Method	: 1,8270D	Dilution Factor	: 1
Lab File ID	: 45804-04	Analyst	: EK
Sample Amount	: 30.16 g	Instrument ID	: SV112
Extraction Method	: EPA 3546	GC Column	: RTX5-MS
Extract Volume	: 1000 uL	%Solids	: 89
GPC Cleanup	: N	Injection Volume	: 1 uL

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier
132-64-9	Dibenzofuran	ND	190	18.	U
91-57-6	2-Methylnaphthalene	ND	220	22.	U
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	190	19.	U
98-86-2	Acetophenone	ND	190	23.	U
88-06-2	2,4,6-Trichlorophenol	ND	110	35.	U
59-50-7	p-Chloro-m-cresol	ND	190	28.	U
95-57-8	2-Chlorophenol	ND	190	22.	U
120-83-2	2,4-Dichlorophenol	ND	170	30.	U
105-67-9	2,4-Dimethylphenol	ND	190	61.	U
88-75-5	2-Nitrophenol	ND	400	70.	U
100-02-7	4-Nitrophenol	ND	260	76.	U
51-28-5	2,4-Dinitrophenol	ND	890	87.	U
534-52-1	4,6-Dinitro-o-cresol	ND	480	89.	U
87-86-5	Pentachlorophenol	ND	150	41.	U
108-95-2	Phenol	ND	190	28.	U
95-48-7	2-Methylphenol	ND	190	29.	U
108-39-4/106-44-5	3-Methylphenol/4-Methylphenol	ND	270	29.	U
95-95-4	2,4,5-Trichlorophenol	ND	190	36.	U
65-85-0	Benzoic Acid	ND	600	190	U
100-51-6	Benzyl Alcohol	ND	190	57.	U
86-74-8	Carbazole	ND	190	18.	U

SEP 21 2018

ALPHA ANALYTICAL

Initials: CR

Form 1
GC Organics

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 07:46
Sample Matrix	: SOIL	Date Extracted	: 12/18/17
Analytical Method	: 1,8081B	Dilution Factor	: 1
Lab File ID	: 10171220a-11	Analyst	: JW
Sample Amount	: 15.43 g	Instrument ID	: PEST10
Extraction Method	: EPA 3546	GC Column	: CLPPesticides
Extract Volume	: 1000 uL	%Solids	: 89
GPC Cleanup	: N	Injection Volume	: 1 uL
Sulfur Cleanup	: N		

		ug/Kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
58-89-9	Lindane	ND	0.727	0.325	U
319-84-6	Alpha-BHC	ND	0.727	0.206	U
319-85-7	Beta-BHC	ND	1.74	0.662	U
76-44-8	Heptachlor	ND	0.873	0.391	U
309-00-2	Aldrin	ND	1.74	0.615	U
1024-57-3	Heptachlor epoxide	ND	3.27	0.982	U
72-20-8	Endrin	ND	0.727	0.298	U
7421-93-4	Endrin aldehyde	ND	2.18	0.764	U
53494-70-5	Endrin ketone	ND	1.74	0.450	U
60-57-1	Dieldrin	ND	1.09	0.546	U
72-55-9	4,4'-DDE	ND	1.74	0.404	U
72-54-8	4,4'-DDD	ND	1.74	0.623	U
50-29-3	4,4'-DDT	ND	3.27	1.40	U
959-98-8	Endosulfan I	ND	1.74	0.412	U
33213-65-9	Endosulfan II	ND	1.74	0.583	U
1031-07-8	Endosulfan sulfate	ND	0.727	0.346	U
72-43-5	Methoxychlor	ND	3.27	1.02	U
8001-35-2	Toxaphene	ND	32.7	9.16	U
5103-71-9	cis-Chlordane	ND	2.18	0.608	U
5103-74-2	trans-Chlordane	ND	2.18	0.576	U
57-74-9	Chlordane	ND	14.2	5.78	U

SEP 21 2018

Initials: CR

Form 1
GC Organics

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 07:46
Sample Matrix	: SOIL	Date Extracted	: 12/18/17
Analytical Method	: 1,8081B	Dilution Factor	: 1
Lab File ID	: 10171220a-11	Analyst	: JW
Sample Amount	: 15.43 g	Instrument ID	: PEST10
Extraction Method	: EPA 3546	GC Column	: CLPPesticidesII
Extract Volume	: 1000 uL	%Solids	: 89
GPC Cleanup	: N	Injection Volume	: 1 uL
Sulfur Cleanup	: N		

		ug/Kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
319-86-8	Delta-BHC	0.986	1.74	0.342	J

SEP 21 2018

Initials: CR

Form 1
GC Organics

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 02:56
Sample Matrix	: SOIL	Date Extracted	: 12/18/17
Analytical Method	: 1,8082A	Dilution Factor	: 1
Lab File ID	: P2171219a-28	Analyst	: WR
Sample Amount	: 15.27 g	Instrument ID	: PEST2
Extraction Method	: EPA 3546	GC Column	: CLP-Pesticide
Extract Volume	: 1000 uL	%Solids	: 89
GPC Cleanup	: N	Injection Volume	: 1 uL
Sulfur Cleanup	: Y		

		ug/Kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
12674-11-2	Aroclor 1016	ND	36.7	4.17	U
11104-28-2	Aroclor 1221	ND	36.7	5.59	U
11141-16-5	Aroclor 1232	ND	36.7	3.62	U
53469-21-9	Aroclor 1242	ND	36.7	4.50	U
12672-29-6	Aroclor 1248	ND	36.7	4.12	U
11097-69-1	Aroclor 1254	ND	36.7	3.00	U
11096-82-5	Aroclor 1260	ND	36.7	3.84	U
37324-23-5	Aroclor 1262	ND	36.7	3.02	U
11100-14-4	Aroclor 1268	ND	36.7	2.60	U
1336-36-3	PCBs, Total	ND	36.7	2.60	U

SEP 21 2018

Initials: CR

LDC #: 43079A1
SDG #: L1745804
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Category B

Date: 9/19/18
Page: 1 of 1
Reviewer: EZ
2nd Reviewer: CL

METHOD: GC/MS Volatiles (EPA SW846 Method 8260C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW / SW	% RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	ND	FB= Field Blank 001 TB= Trip Blank
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	ND Result < RL > MDL
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB002 (7-9)	L1745804-04	Soil	12/11/17
2	SB002 (7-9)MS	L1745804-04MS	Soil	12/11/17
3	SB002 (7-9)MSD	L1745804-04MSD	Soil	12/11/17
4				
5				
6				
7				
8				

Notes:

F	WG1075119-5 Blank						

LDC #: 43079A1

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FT
2nd Reviewer:

Method: Volatiles (EPA SW 846 Method 8260C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?	~~✓~~	✓		
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) < 30%?	~~✓~~	✓		
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			

LDC #: 43079A1

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤20 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: 20%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
		ICAL-VHH_171229 VOA III	HHHH		0.002 (≥0.005)	All	J/UJ/A ND

INICAL.wpd

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was an initial calibration verification standard analyzed after each ICAL for each instrument?
Y N N/A Were all %D within the validation criteria of ≤20 %D?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications
	12/19/17 6403	ICV-VOA III	JJ	34.1	All	J/UJ/A ND

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: <20.0%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	12/20/17 0648	CCV-VOA 111	HHHH		0.00218 (70.005)	All	J/UJ/A (ND)

CONCAL.wpd

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 12/20/17
Conc. units: ug/Kg
Associated Samples: All (ND)

Compound	Blank ID	Sample Identification							
	WG1075119-5 Blank								
B	2.7								

Blank analysis date:
Conc. units:
Associated Samples:

Compound	Blank ID	Sample Identification							

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

.LDC #: #3679A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer:

METHOD : GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	2 & 3	refer to following pages	( )	( )	( )	1	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )	All %R = J/UJ/A all ND	
			( )	( )	( )		
			( )	( )	( )	All %RPD = J/A all ND	
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Matrix Spike
Form 3

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Client Sample ID	: SB002 (7-9)	Matrix	: SOIL
Lab Sample ID	: L1745804-04	Analysis Date	: 12/20/17 16:17
Matrix Spike	: WG1075119-6	MS Analysis Date	: 12/20/17 16:43
Matrix Spike Dup	: WG1075119-7	MSD Analysis Date	: 12/20/17 17:09

		Matrix Spike Sample			Matrix Spike Duplicate					
Parameter	Sample Conc. (ug/kg)	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	RPD	Recovery Limits	RPD Limit
Methylene chloride	ND	112	85.	76	108	85.	79	0	70-130	30
1,1-Dichloroethane	ND	112	95.	85	108	92.	86	3	70-130	30
Chloroform	ND	112	90.	80	108	87.	80	3	70-130	30
Carbon tetrachloride	ND	112	100	93	108	97.	90	7	70-130	30
1,2-Dichloropropane	ND	112	89.	80	108	87.	81	2	70-130	30
Dibromochloromethane	ND	112	85.	75	108	84.	78	0	70-130	30
1,1,2-Trichloroethane	ND	112	82.	73	108	82.	76	1	70-130	30
Tetrachloroethene AA	ND	112	86.	76	108	72.	67 Q	17	70-130	30
Chlorobenzene DD	ND	112	78.	69 Q	108	69.	64 Q	13	70-130	30
Trichlorofluoromethane	ND	112	110	98	108	100	94	8	70-139	30
1,2-Dichloroethane	ND	112	83.	74	108	84.	78	1	70-130	30
1,1,1-Trichloroethane	ND	112	100	90	108	95.	88	6	70-130	30
Bromodichloromethane	ND	112	88.	78	108	86.	80	2	70-130	30
trans-1,3-Dichloropropene	ND	112	82.	73	108	80.	74	3	70-130	30
cis-1,3-Dichloropropene	ND	112	84.	75	108	81.	75	4	70-130	30
1,1-Dichloropropene	ND	112	99.	88	108	90.	83	9	70-130	30
Bromoform	ND	112	85.	76	108	86.	79	1	70-130	30
1,1,2,2-Tetrachloroethane BB	ND	112	78.	69 Q	108	81.	75	4	70-130	30
Benzene	ND	112	91.	81	108	87.	80	6	70-130	30
Toluene	ND	112	86.	76	108	77.	71	11	70-130	30
Ethylbenzene EE	ND	112	80.	71	108	67.	62 Q	17	70-130	30
Chloromethane	ND	112	100	89	108	100	94	2	52-130	30
Bromomethane	ND	112	93.	83	108	95.	88	1	57-147	30
Vinyl chloride	ND	112	110	96	108	110	99	1	67-130	30

#2 + 3
ws lab limits

Matrix Spike
Form 3

Client	: P. W. Grosser	**Lab Number**	: L1745804
Project Name	: BBU1702	**Project Number**	: BBU1702
Client Sample ID	: SB002 (7-9)	**Matrix**	: SOIL
Lab Sample ID	: L1745804-04	**Analysis Date**	: 12/20/17 16:17
Matrix Spike	: WG1075119-6	**MS Analysis Date**	: 12/20/17 16:43
Matrix Spike Dup	: WG1075119-7	**MSD Analysis Date**	: 12/20/17 17:09

		Matrix Spike Sample			Matrix Spike Duplicate					
Parameter	Sample Conc. (ug/kg)	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	RPD	Recovery Limits	RPD Limit
Chloroethane D	ND	112	100	89	108	34.	31 Q	99 Q	50-151	30
1,1-Dichloroethene	ND	112	110	94	108	100	94	4	65-135	30
trans-1,2-Dichloroethene	ND	112	97.	87	108	92.	85	6	70-130	30
Trichloroethene	ND	112	91.	81	108	83.	77	9	70-130	30
1,2-Dichlorobenzene JJJ	ND	112	68.	61 Q	108	61.	56 Q	12	70-130	30
1,3-Dichlorobenzene FFF	ND	112	66.	59 Q	108	56.	52 Q	17	70-130	30
1,4-Dichlorobenzene HHH	ND	112	64.	57 Q	108	54.	50 Q	17	70-130	30
Methyl tert butyl ether	ND	112	83.	74	108	87.	81	4	66-130	30
p/m-Xylene RRR	ND	224	160	69 Q	216	130	60 Q	18	70-130	30
o-Xylene SSS	ND	224	160	70	216	140	62 Q	14	70-130	30
cis-1,2-Dichloroethene	ND	112	91.	81	108	88.	82	3	70-130	30
Dibromomethane	ND	112	82.	73	108	83.	77	1	70-130	30
Styrene FF	ND	224	150	68 Q	216	130	62 Q	13	70-130	30
Dichlorodifluoromethane	ND	112	120	102	108	110	102	4	30-146	30
Acetone	ND	112	81.	72	108	92.	85	13	54-140	30
Carbon disulfide	ND	112	99.	88	108	92.	85	8	59-130	30
2-Butanone	ND	112	78.	70	108	90.	83	14	70-130	30
Vinyl acetate HH	ND	112	52.	46 Q	108	31.	28 Q	51 Q	70-130	30
4-Methyl-2-pentanone Y	ND	112	78.	69 Q	108	83.	77	6	70-130	30
1,2,3-Trichloropropane XX	ND	112	76.	68	108	78.	72	2	68-130	30
2-Hexanone Z	ND	112	76.	68 Q	108	82.	76	7	70-130	30
Bromochloromethane	ND	112	88.	78	108	87.	80	1	70-130	30
2,2-Dichloropropane	ND	112	100	89	108	94.	87	6	70-130	30
1,2-Dibromoethane	ND	112	80.	71	108	80.	74	1	70-130	30

Matrix Spike
Form 3

Client	: P. W. Grosser	**Lab Number**	: L1745804
Project Name	: BBU1702	**Project Number**	: BBU1702
Client Sample ID	: SB002 (7-9)	**Matrix**	: SOIL
Lab Sample ID	: L1745804-04	**Analysis Date**	: 12/20/17 16:17
Matrix Spike	: WG1075119-6	**MS Analysis Date**	: 12/20/17 16:43
Matrix Spike Dup	: WG1075119-7	**MSD Analysis Date**	: 12/20/17 17:09

		Matrix Spike Sample			Matrix Spike Duplicate					
Parameter	Sample Conc. (ug/kg)	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	RPD	Recovery Limits	RPD Limit
1,3-Dichloropropane	ND	112	81.	72	108	81.	75	1	69-130	30
1,1,1,2-Tetrachloroethane	ND	112	87.	77	108	81.	75	7	70-130	30
Bromobenzene WW	ND	112	74.	66 Q	108	66.	61 Q	12	70-130	30
n-Butylbenzene III	ND	112	61.	54 Q	108	45.	42 Q	30	70-130	30
sec-Butylbenzene EEE	ND	112	72.	64 Q	108	55.	51 Q	26	70-130	30
tert-Butylbenzene CCC	ND	112	76.	67 Q	108	60.	56 Q	23	70-130	30
o-Chlorotoluene	ND	112	72.	64 Q	108	59.	54 Q	20	70-130	30
p-Chlorotoluene	ND	112	68.	61 Q	108	56.	52 Q	19	70-130	30
1,2-Dibromo-3-chloropropane	ND	112	78.	69	108	82.	76	5	68-130	30
Hexachlorobutadiene LLL	ND	112	56.	50 Q	108	40.	37 Q	33 Q	67-130	30
Isopropylbenzene VV	ND	112	78.	70	108	64.	59 Q	21	70-130	30
p-Isopropyltoluene GGG	ND	112	67.	59 Q	108	51.	47 Q	26	70-130	30
Naphthalene MMM	ND	112	68.	60 Q	108	67.	62 Q	1	70-130	30
Acrylonitrile GGGG	ND	112	78.	69 Q	108	83.	77	6	70-130	30
n-Propylbenzene YY	ND	112	72.	64 Q	108	56.	52 Q	24	70-130	30
1,2,3-Trichlorobenzene NNN	ND	112	61.	55 Q	108	55.	51 Q	11	70-130	30
1,2,4-Trichlorobenzene KKK	ND	112	58.	51 Q	108	50.	47 Q	14	70-130	30
1,3,5-Trimethylbenzene AAA	ND	112	72.	64 Q	108	58.	54 Q	21	70-130	30
1,2,4-Trimethylbenzene DDD	ND	112	70.	62 Q	108	57.	52 Q	20	70-130	30
1,4-Dioxane	ND	5610	5500	98	5400	5600	104	2	65-136	30
p-Diethylbenzene	ND	112	61.	54 Q	108	46.	43 Q	27	70-130	30
p-Ethyltoluene	ND	112	69.	62 Q	108	55.	50 Q	24	70-130	30
1,2,4,5-Tetramethylbenzene	ND	112	63.	56 Q	108	51.	48 Q	20	70-130	30
Ethyl ether	ND	112	85.	76	108	88.	81	3	67-130	30

Matrix Spike
Form 3

Client	: P. W. Grosser	**Lab Number**	: L1745804
Project Name	: BBU1702	**Project Number**	: BBU1702
Client Sample ID	: SB002 (7-9)	**Matrix**	: SOIL
Lab Sample ID	: L1745804-04	**Analysis Date**	: 12/20/17 16:17
Matrix Spike	: WG1075119-6	**MS Analysis Date**	: 12/20/17 16:43
Matrix Spike Dup	: WG1075119-7	**MSD Analysis Date**	: 12/20/17 17:09

		Matrix Spike Sample			Matrix Spike Duplicate					
Parameter	Sample Conc. (ug/kg)	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	RPD	Recovery Limits	RPD Limit
trans-1,4-Dichloro-2-butene	ND	112	79.	70	108	82.	76	4	70-130	30

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GCMS 8260C

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:

Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 40 std)	Recalculated (RRF 40 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	12/19/2017	V	1.015	1.015	1.015	1.015	2.20	2.20
	V111		CC	0.836	0.836	0.826	0.826	2.02	2.02
			BB	0.657	0.657	0.646	0.646	3.49	3.49

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV 0648	12/20/17	V (1st internal standard)	1.015	1.001	1.001	1.4	1.4
			CC (2nd internal standard)	0.826	0.815	0.815	1.3	1.3
			BB (3rd internal standard)	0.646	0.655	0.655	1.4	1.4
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	20.0	19.343	97	97	0
1,2-Dichloroethane-d4	↓	19.513	98	98	↓
Toluene-d8		19.812	99	99	
Bromofluorobenzene		20.372	102	102	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 43079 A1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 2 + 3

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
1,1-Dichloroethene	112	108	ND	105.83	101.525	94	94	94	94	4	4
Trichloroethene	↓	↓	↓	91.325	83.101	81	81.5	77	76.9	9	9
Benzene	↓	↓	↓	91.447	86.538	81	81.6	80	80.7	6	6
Toluene	↓	↓	↓	85.77	76.64	76	76.5	71	70.9	11	11
Chlorobenzene	↓	↓	↓	77.911	68.711	69	69.5	64	63.6	13	13

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA Method 8260C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: WG107511 9-3/4

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	20.0	20.0	20.399	20.174	102	102	101	101	1	1
Trichloroethene	↓	↓	19.758	19.763	99	99	99	99	0	0
Benzene	↓	↓	19.731	19.645	99	99	98	98	1	1
Toluene	↓	↓	19.737	19.517	99	99	98	98	1	1
Chlorobenzene	↓	↓	19.466	19.245	97	97	96	96	1	1

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. LCS, V:

Conc. = $\frac{(164390)(20)}{(164201)(1.015)}$

=

19.73

#	Sample ID	Compound	Reported Concentration (ng/L)	Calculated Concentration (ng/L)	Qualification
	WG107519-	V	19.73	19.73	
	LCS				

LDC #: 43079A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 9/19/18
SDG #: L1745804 Category B Page: 1 of 1
Laboratory: Alpha Analytical, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A /A	% RSD ≤ 20, r^2 ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB= Field Blank 001
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	NO Results < RL > MDL
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB002 (7-9)	L1745804-04	Soil	12/11/17
2	SB002 (7-9)MS	L1745804-04MS	Soil	12/11/17
3	SB002 (7-9)MSD	L1745804-04MSD	Soil	12/11/17
4				
5				
6				
7				
8				

Notes:

	WG1073744-1 Blank						

LDC #: 43079 A2a

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10%, was a reanalysis performed to confirm %R ?			✓	

LDC #: 43079 A2a

VALIDATION FINDINGS CHECKLIST

Page: 3 of 7
Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	AA. 2-Chloronaphthalene	AAA. Butylbenzylphthalate	AAAA. Dibenzothiophene	A1. N-Nitrosodiethylamine
B. Bis (2-chloroethyl) ether	BB. 2-Nitroaniline	BBB. 3,3'-Dichlorobenzidine	BBBB. Benzo(a)fluoranthene	B1. N-Nitrosodi-n-butylamine
C. 2-Chlorophenol	CC. Dimethylphthalate	CCC. Benzo(a)anthracene	CCCC. Benzo(b)fluorene	C1. N-Nitrosomethylethylamine
D. 1,3-Dichlorobenzene	DD. Acenaphthylene	DDD. Chrysene	DDDD. cis/trans-Decalin	D1. N-Nitrosomorpholine
E. 1,4-Dichlorobenzene	EE. 2,6-Dinitrotoluene	EEE. Bis(2-ethylhexyl)phthalate	EEEE. Biphenyl	E1. N-Nitrosopyrrolidine
F. 1,2-Dichlorobenzene	FF. 3-Nitroaniline	FFF. Di-n-octylphthalate	FFFF. Retene	F1. Phenacetin
G. 2-Methylphenol	GG. Acenaphthene	GGG. Benzo(b)fluoranthene	GGGG. C30-Hopane	G1. 2-Acetylaminofluorene
H. 2,2'-Oxybis(1-chloropropane)	HH. 2,4-Dinitrophenol	HHH. Benzo(k)fluoranthene	HHHH. 1-Methylphenanthrene	H1. Pronamide
I. 4-Methylphenol	II. 4-Nitrophenol	III. Benzo(a)pyrene	IIII. 1,4-Dioxane	I1. Methyl methanesulfonate
J. N-Nitroso-di-n-propylamine	JJ. Dibenzofuran	JJJ. Indeno(1,2,3-cd)pyrene	JJJJ. Acetophenone	J1. Ethyl methanesulfonate
K. Hexachloroethane	KK. 2,4-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	KKKK. Atrazine	K1. o,o',o''-Triethylphosphorothioate
L. Nitrobenzene	LL. Diethylphthalate	LLL. Benzo(g,h,i)perylene	LLLL. Benzaldehyde	L1. n-Phenylene diamine
M. Isophorone	MM. 4-Chlorophenyl-phenyl ether	MMM. Bis(2-Chloroisopropyl)ether	MMMM. Caprolactam	M1. 1,4-Naphthoquinone
N. 2-Nitrophenol	NN. Fluorene	NNN. Aniline	NNNN. 2,6-Dichlorophenol	N1. N-Nitro-o-toluidine
O. 2,4-Dimethylphenol	OO. 4-Nitroaniline	OOO. N-Nitrosodimethylamine	OOOO. 1,2-Diphenylhydrazine	O1. 1,3,5-Trinitrobenzene
P. Bis(2-chloroethoxy)methane	PP. 4,6-Dinitro-2-methylphenol	PPP. Benzoic Acid	PPPP. 3-Methylphenol	P1. Pentachlorobenzene
Q. 2,4-Dichlorophenol	QQ. N-Nitrosodiphenylamine	QQQ. Benzyl alcohol	QQQQ. 3&4-Methylphenol	Q1. 4-Aminobiphenyl
R. 1,2,4-Trichlorobenzene	RR. 4-Bromophenyl-phenylether	RRR. Pyridine	RRRR. 4-Dimethyldibenzothiophene (4MDT)	R1. 2-Naphthylamine
S. Naphthalene	SS. Hexachlorobenzene	SSS. Benzidine	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	S1. Triphenylene
T. 4-Chloroaniline	TT. Pentachlorophenol	TTT. 1-Methylnaphthalene	TTTT. 1-Methyldibenzothiophene (1MDT)	T1. Octachlorostyrene
U. Hexachlorobutadiene	UU. Phenanthrene	UUU.Benzo(b)thiophene	UUUU.. 2,3,4,6-Tetrachlorophenol	U1. Famphur
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV. 1,2,4,5-Tetrachlorobenzene	V1. 1,4-phenylenediamine
W. 2-Methylnaphthalene	WW. Carbazole	WWW.Benzo(e)pyrene	WWWW.. 2-Picoline	W1. Methapyrilene
X. Hexachlorocyclopentadiene	XX. Di-n-butylphthalate	XXX. 2,6-Dimethylnaphthalene	XXXX. 3-Methylcholanthrene	X1. Pentachloroethane
Y. 2,4,6-Trichlorophenol	YY. Fluoranthene	YYY. 2,3,5-Trimethylnaphthalene	YYYY. a,a-Dimethylphenethylamine	Y1. 3,3'-Dimethylbenzidine
Z. 2,4,5-Trichlorophenol	ZZ. Pyrene	ZZZ. Perylene	ZZZZ. Hexachloropropene	Z1. o-Toluidine

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	12/18/17 1047	CCV-Buffy	A	21.0		WG1073744-1 Blank	J/UJ/A
			B	25.2			
			MMM	37.5			
			P	21.5			
			DDD	20.5			

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	2 & 3	TT	( )	110 (17-109)	( )	1	J dl / P ND
		PPP	0 (10-110)	0 (10-110)	( )	↓	J/R/P ↓
			( )	( )			
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	WG1073744-2/3	*	105 (26-103)	( )	( )	All	Jdet/P all ND
	Les ID	PPP	0 (10-110)	0 (10-110)	( )	↓	J/R/P
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
	*p-chloro-m-	cresol	( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 43079 A2a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GCMS SVOA 8270D

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:

Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 20 std)	Recalculated (RRF 20 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	12/7/2017	A	1.773	1.773	1.696	1.696	2.92	2.92
	BUFFY		JJJJ	1.745	1.745	1.684	1.684	2.84	2.84
			S	1.088	1.088	1.029	1.029	8.92	8.92
			VVVV	0.298	0.298	0.288	0.288	2.57	2.57
			GG	1.288	1.288	1.222	1.222	7.50	7.50
			UU	1.188	1.188	1.141	1.141	7.44	7.44
			DDD	1.199	1.199	1.142	1.142	6.09	6.09
			JJJ	1.078	1.078	1.011	1.011	13.66	13.66

LDC #: #3079 A2a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GCMS SVOA 8270D

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:

Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 20 std)	Recalculated (RRF 20 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	10/18/2017	A	1.989	1.989	1.988	1.988	5.88	5.88
	SV112		JJJJ	2.239	2.239	2.257	2.257	5.69	5.69
			S	1.084	1.084	1.080	1.080	6.70	6.70
			VVVV	0.273	0.273	0.275	0.275	3.31	3.31
			GG	1.332	1.332	1.335	1.335	6.77	6.77
			UU	1.248	1.248	1.233	1.233	7.19	7.19
			DDD	1.279	1.279	1.278	1.278	5.30	5.30
			JJJ	1.249	1.249	1.201	1.201	4.45	4.45

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV Buffy 10:47 11:12	12/18/17	A (1st IS)	1.696	1.340	1.340	21.0	21.0
			JJJ (2nd IS)	1.681	1.464	1.464	13.1	13.1
			S (3rd IS)	1.029	0.876	0.876	14.9	14.9
			VVVV (4th IS)	0.288	0.283	0.283	1.7	1.7
			GG (5th IS)	1.222	1.015	1.015	16.9	16.9
			UU (6th IS)	1.141	0.916	0.916	19.7	19.7
2			DDD (1st IS)	1.142	0.900	0.900	20.5	20.5
			JJJ (2nd IS)	1.011	0.971	0.971	4.0	4.0
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	KCV 10:48 11:13	12/19/17	A (1st IS)	1.988	1.756	1.756	11.7	11.7
			JJJJ (2nd IS)	2.257	2.216	2.216	1.8	1.8
			S (3rd IS)	1.080	0.981	0.981	9.2	9.2
			VVVV (4th IS)	0.275	0.292	0.292	6.2	6.2
			GG (5th IS)	1.335	1.182	1.182	11.5	11.5
			UU (6th IS)	1.233	1.095	1.095	11.2	11.2
2			DDD (1st IS)	1.278	1.156	1.156	9.5	9.5
			JJJ (2nd IS)	1.201	1.140	1.140	5.1	5.1
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079 A2a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	25.0	18.274	73	73	0
2-Fluorobiphenyl	↓	20.469	82	82	
Terphenyl-d14	↓	17.508	70	70	
Phenol-d5	50.0	38.509	77	77	
2-Fluorophenol	↓	38.232	76	76	
2,4,6-Tribromophenol	↓	40.701	81	81	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 2 & 3

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol	1490	1490	U	1100	1100	74	74	74	74	U	0
N-Nitroso-di-n-propylamine	↓	↓	↓	1100	1100	74	74	74	74	U	0
4-Chloro-3-methylphenol	↓	↓	↓	1100	1200	74	74	81	81	9	9
Acenaphthene	1490	1490	↓	1100	1200	74	74	81	81	9	9
Pentachlorophenol	↓	↓	↓	1500	1600	100	100	110	107	6	6
Pyrene	↓	↓	↓	1100	1200	74	1100	81	81	9	9

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: WG1073744-2/3 1051D

Compound	Spike Added (ug/kg)		Spike Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	1300	1300	1033.36 1000	1092.87 1100	79	79	83	84	5	5
N-Nitroso-di-n-propylamine			1000	1100	78	78	84	84	7	7
4-Chloro-3-methylphenol			1300 1071.48	1400 1152.88	98	98	105	105	7	7
Acenaphthene			1100	1200	82	82	88	88	7	7
Pentachlorophenol			1100	1100	82	82	87	87	6	6
Pyrene			1200	1300	90	90	96	96	6	6

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A2a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer: [signature]

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. LCS, GG

Conc. = $\frac{345865\ (40)\ (1)\ (1000)}{346426\ (1.222)\ (30.50)}$

= 1071.48 ug/kg

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Qualification
	WG1073744-2 LCS	Acenaphthene (GG)	1100	1071.48	
	wt = 30.50				
	vol = 1 ml				

LDC #: 43079A3a
SDG #: L1745804
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Category B

Date: 9/19/18
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW846 Method 8081B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC Instrument Performance Check	A	
III.	Initial calibration/ICV	A / A	% RSD ≤ 20, r² ICV ≤ 20
IV.	Continuing calibration	A	CCV ≤ 20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB = Field Blank 001
VII.	Surrogate spikes 1/4	A/A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Compound quantitation/RL/LOQ/LODs	SW	Results < RL > MDL = Jdet
XII.	Target compound identification	A	
XIII.	System Performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB002 (7-9)	L1745804-04	Soil	12/11/17
2	SB002 (7-9)MS	L1745804-04MS	Soil	12/11/17
3	SB002 (7-9)MSD	L1745804-04MSD	Soil	12/11/17
4				
5				
6				
7				
8				
9				
10				

Notes:

	WG1074141 - Blank						

LDC #: 43079 A3a

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FT
2nd Reviewer:

Method: Pesticides (EPA SW 846 Method 8081)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and at beginning of each 12-hour shift?	✓			
Were endrin and 4,4'-DDT breakdowns ≤ 15% for individual breakdown in the Evaluation mix standards?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the RT windows properly established?	✓			
IIIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes/Internal Standards				
Were all surrogate percent recovery (%R) within the QC limits?	✓			

LDC #: 43079A3a

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?	✓			
If any percent recovery (%R) was less than 10 percent, was a reanalysis performed to confirm %R?	✓			
Were internal standard area counts within ± 50% of the average area calculated during calibration?	✓			
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
Were relative percent difference (RPD) of the results between two columns ≤ 40%?		✓		
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Arochlor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 43079A3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: FT
2nd Reviewer: S

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Associated Samples	Compound Name	%RPD Between 2 cols ≤ 40 Findings	Qualifications
	#1	C	92	J det /A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 43079A3a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC __X_____ HPLC _____

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported 4.0	Recalculated 4.0	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	12/6/2017	Gamma BHC CLP1	1.309	1.309	1.331	1.331	10.68	1.331
	PEST 10		Delta BHC CLP1	1.228	1.228	1.257	1.257	11.09	1.257
			Gamma BHC CLP2	1.285	1.285	1.303	1.303	7.83	1.303
			Delta BHC CLP2	1.203	1.203	1.271	1.271	12.55	1.271

LDC #: 43679A3q

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC Pesticides (EPA SW 846 Method 8081)

Percent difference (%D) = 100 * (N - C)/N

Where: N = Initial Calibration Factor or Nominal Amount (ng)
C = Calibration Factor from Continuing Calibration Standard or Calculated Amount (ng)

Standard ID	Calibration Date/Time	Compound	Average CF/ CCV Conc	Reported CF/Conc CCV	Recalculated CF/Conc CCV	Reported %D	Recalculated %D
ccv 5:11	12/20/18	gamma BHC	50.00	46.911	46.911	6.2	6.2
		delta BHC		49.183	49.183	1.6	1.6
		↓		49.203	49.203	1.6	1.6
		↓		47.286	47.286	5.4	5.4

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A3a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer:

METHOD: GC Pesticides (EPA SW 846 Method 8081)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: 1

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene	clp1	50.0	42.816	86	86	0
Tetrachloro-m-xylene	clp2	↓	43.029	86	86	↓
Decachlorobiphenyl	clp1	↓	39.357	79	79	↓
Decachlorobiphenyl	clp2	↓	52.274	105	105	↓

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Sample ID:

Surrogate	Column	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
Tetrachloro-m-xylene						
Tetrachloro-m-xylene						
Decachlorobiphenyl						
Decachlorobiphenyl						

Notes:

LDC #: 43079A3a

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC Pesticides (EPA SW 846 Method 8081)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 2 & 3

Compound	Spike Added (ug/Kg)		Sample Concentration (ug/Kg)	Spiked Sample Concentration (ug/Kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	36.9	37.3	ND	32.1	33.6	87	87	90	90	5	4.6
4,4'-DDT	↓	↓	↓	34.9	37.1	95	95	99	99	6	6.1

Comments: Refer ot Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43679A3a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: WG1674141-2/3

Compound	Spike Added (ug/Kg)		Spiked Sample Concentration (ug/Kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	31.5	32.5	26.221	31.5 (31.498)	83	83	97	97	16	18
4,4'-DDT	↓	↓	26.619	31.458	84	84	97	97	14 ↓ Based on %R	17 ↓ Based on Conc.

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A3a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: EJ
2nd reviewer:

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1 , Delta BHC

Conc. = $\frac{(3262290)(x.0)(10)}{(47358361)(1.271)(15.43)(0.89)}$

= 0.9866 ug/kg

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Qualification
	#1	Delta BHC	0.986	0.986	

LDC #: 43079A3b

SDG #: L1745804

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Category B

Date: 9/19/18

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A / A	%RSD/ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	ND	FB = Field Blank 001
VI.	Surrogate spikes 1/5	A/A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Field duplicates	N	
X.	Compound quantitation/RL/LOQ/LODs	A	No Results < RL > MDL
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB002 (7-9)	L1745804-04	Soil	12/11/17
2	SB002 (7-9)MS	L1745804-04MS	Soil	12/11/17
3	SB002 (7-9)MSD	L1745804-04MSD	Soil	12/11/17
4				
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

1	WG1074155-1Blank						

LDC #: 43079 A3b

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: B
2nd Reviewer: C

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓	•		
Were target compounds detected in the field blanks?		✓		
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 43079A3b

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer:
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

LDC #: 43079A3b

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: [signature]

METHOD: GC __X_____ HPLC _____

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported 1000ppb	Recalculated 1000ppb	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	10/1/2016	AR1260-A Signal 1	0.052	0.052	0.050	0.050	8.61	8.61
	ICAL12973								
			AR1260-1 Signal 2	0.045	0.045	0.046	0.046	10.1	10.1

LDC #: 43079A3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: C

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV 22:36	12/19/17	PCB 1260-1 CVP1	2500.0	2517.689	2517.689	0.7	0.7
			PCB 1260-1 CVP2	2500.0	2633.058	2633.058	5.3	5.3
2								
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer:

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: # 1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TCMX	CLP1	500.0	336.651	67	67	0
TCMX	CLP2	↓	355.208	71	71	↓
DCB	CLP1	↓	293.059	59	59	↓
DCB	CLP2	↓	318.221	64	64	↓

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 43079 A3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added; MS = Matrix spike; MSD = Matrix spike duplicate

MS/MSD samples: 2 + 3

Compound	Spike Added (ug/kg)		Sample Conc. (ug/kg)	Spike Sample Concentration (ug/kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
Aroclor 1260	232	226	ND	134	159	58	58	70	70	17	17

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration; SA = Spike added
LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: WG1074155 2/3 LCS/D

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
Aroclor 1260	203	207	123.13	139.23	61	61	67	67	9	~~X~~ 12
									Based %R	Based on Conc

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079A36

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: ET
2nd Reviewer:

METHOD: / **GC** __ **HPLC**

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= $\frac{(A)(Fv)(Df)}{(RF)(Vs \text{ or } Ws)(\%S/100)}$

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. LCS Compound Name Aroclor 1260

Concentration = $\frac{(1900)(5)(1)}{(15.43)(5)}$ =

=

#	Sample ID	Compound	Reported Concentrations (ug/kg)	Recalculated Results Concentrations (ug/kg)	Qualifications
	WG1074155/2(LCS)	Aroclor 1260	123	123.17	
	1260-1 = 3020.8 x 10^6 (250.0)		1260-1 = 2237.79		
	6749.5 x 10^6 (0.050)		2 = 2093.391		
			3 = 1694.042		
	= 2237.79		4 = 1688.002		
			5 = 1748.798		

Ave = 1900

Comments:

Site: Williamsbridge Gardens
Laboratory: Alpha Analytical, Inc.
Report No.: L1745804
Reviewer: An Le and Christina Rink/Laboratory Data Consultants for P.W. Grosser Consulting
Date: September 20, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
SB002 (7-9)	L1745804-04	Metals
SB002 (7-9)MS	L1745804-04MS	Metals
SB002 (7-9)MSD	L1745804-04MSD	Metals

Associated QC Samples(s):
Field/Trip Blanks: Field Blank 001
Field Duplicate pair: None Associated

The above-listed soil samples were collected on December 11, 2017 and were analyzed for metals by SW-846 methods 6010C/7471B. The data validation was performed in accordance with the USEPA Region 2 *Standard Operating Procedure for the Evaluation of Metals for the Contract Laboratory Program,* SOP HW-2a/c, Revision 15 (December 2012) and the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review,* EPA 540-R-2017-001 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The inorganic data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times and Sample Preservation
- Instrument Calibration
- Contract Required Quantitation Limit (CRQL) Standard Recoveries
- Blank Analysis Results
- Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Results
- Matrix Spike (MS) Results
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Serial Dilution Results
- Moisture Content
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times and Sample Preservation

All criteria were met.

Instrument Calibration

All criteria were met.

CRQL Standard Recoveries

Analytes that did not meet criteria are summarized in the following table.

Date	Calibration ID	Analyte	%R (Limits)	Associated Samples	Validation Action
12/20/17	CRI (10:01)	Sodium	10 (70-130)	SB002 (7-9)	J detects

The sodium results may be biased low due to low CRQL percent recovery. The result can be used for project objectives as an estimated value (J) which may have a minor impact on the data usability.

Although the iron CRQL standards were outside validation limits, no action was taken since the affected sample is greater than two times the reporting limit (RL).

Blank Results

Analytes were detected below the reporting limits in the laboratory blank samples. The following table summarizes the contamination and validation actions taken.

Blank ID	Analyte	Level Detected	Action Level	Associated Samples
ICB/CCB	Iron	0.0195 mg/L	RL	SB002 (7-9)

Blank Actions for analytes detected below the reporting limit(RL).
If the sample result is < RL, report the result as nondetect (U) at the RL.
If the sample result is > RL or nondetect, no action is required.
Blank Actions for analytes detected above the reporting limit or RL.
If the sample result is < RL and <action level; report the result as nondetect (U) at the RL.
If the sample result is > RL and < action level; report the result as nondetect (U) at the reported value.
If the sample result is > action level or nondetect, no action is required.

No samples were qualified since the associated sample results were nondetect.

Contamination was detected in the field blank sample Field Blank 001 for the metals analyses. The following table summarizes the contamination greater than the reporting limit and validation actions taken.

Blank ID	Analyte	Level Detected	Action Level	Associated Samples
Field Blank 001	Calcium	0.700 mg/L	RL	SB002 (7-9)
	Zinc	0.002 mg/L	RL	

Blank Actions for analytes detected above the reporting limit(RL).
If the sample result is < RL and < action level; report the result as nondetect (U) at the RL.
If the sample result is > RL and < action level; report the result as nondetect (U) at the reported value.
If the sample result is > action level or nondetect, no action is required.

No samples were qualified since the associated sample results were greater than the action level.

ICP ICS Results

Analytes were within control limits in the ICSA and ISCAB analyses.

MS/MSD Results

MS/MSD analyses were performed on sample SB002 (7-9) for metals analyses. The following table lists the analytes which exhibited recoveries outside of the control limits in the MS/MSD and the resulting validation actions.

Analyte	MS %R (Limits)	MSD %R (Limits)	RPD Limits	Associated Samples	Validation Actions
Cadmium	60 (75-125)	55 (75-125)	-	SB002 (7-9)	UJ nondetects
Calcium	-	161 (75-125)	-	SB002 (7-9)	J detects
Potassium	-	134 (75-125)	-		J detects
Mercury	142 (80-120)	142 (80-120)	-	SB002 (7-9)	None

- Within control limits

The cadmium result may be biased low due to low MS/MSD percent recovery. The result can be used for project objectives as a nondetect with an estimated quantitation limit (UJ) which may have a minor impact on the data usability.

The calcium and potassium results may be biased high due to high MS/MSD percent recoveries. The results can be used for project objectives as estimated values (J) which may have a minor impact on the data usability.

Validation action was not required for mercury due to high MS/MSD percent recovery as positive results only are affected and this analyte was not detected in the associated sample.

Laboratory Duplicate Results

Laboratory duplicates were not associated with this sample set. Validation action was not required on this basis.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Serial Dilution Results

A serial dilution analysis was performed on sample SB002 (7-9) for metals analyses. Analytes that did not meet the criteria are summarized in the following table.

Diluted Sample	Analyte	%D (Limits)	Associated Samples	Validation Actions
SB002 (7-9)	Barium	11 (≤10)	SB002 (7-9)	J detects
	Iron	17 (≤10)		J detects
	Magnesium	14 (≤10)		J detects
	Manganese	14 (≤10)		J detects

The barium, iron, magnesium, and manganese results were estimated due to serial dilution percent difference exceedances. The bias cannot be determined. The results can be used for project objectives as estimated values (J) which may have a minor impact on the data usability.

Moisture Content

All criteria were met.

Detection Limits Results

Results were reported which were below the reporting limit (RL) and above the method detection limit (MDL) in the metals analyses. These results were estimated (J) by the laboratory.

Due to high target analyte levels or sample matrix, select samples were analyzed at dilutions. The following table lists the sample dilutions which were performed and the results reported. RLs were elevated accordingly.

Sample	Metals analyses Reported
SB002 (7-9)	2-fold dilution due to high target analyte levels

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

Form 1
METALS

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 18:12
Sample Matrix	: SOIL	Dilution Factor	: 2
Analytical Method	: 1,6010C	Analyst	: AB
Lab File ID	: WG1074772.pdf	Instrument ID	: TRACE6
Sample Amount	: 1.275g	%Solids	: 89
Digestion Method	: EPA 3050B	Date Digested	: 12/19/17

CAS NO.	Parameter	mg/kg Results	RL	MDL	Qualifier	
7429-90-5	Aluminum, Total	9960	8.80	2.38		
7440-36-0	Antimony, Total	ND	4.40	0.334	U	UJC
7440-38-2	Arsenic, Total	0.616	0.880	0.183	J	UJC
7440-39-3	Barium, Total	67.2	0.880	0.153		UJC
7440-41-7	Beryllium, Total	0.669	0.440	0.029		
7440-43-9	Cadmium, Total	ND	0.880	0.086	U	UJC
7440-70-2	Calcium, Total	1570	8.80	3.08		UJC
7440-47-3	Chromium, Total	25.5	0.880	0.085		
7440-48-4	Cobalt, Total	13.3	1.76	0.146		
7440-50-8	Copper, Total	23.5	0.880	0.227		
7439-89-6	Iron, Total	21000	4.40	0.795		UJC
7439-92-1	Lead, Total	4.85	4.40	0.236		
7439-95-4	Magnesium, Total	4030	8.80	1.36		UJC
7439-96-5	Manganese, Total	624	0.880	0.140		UJC
7440-02-0	Nickel, Total	17.2	2.20	0.213		
7440-09-7	Potassium, Total	2220	220	12.7		UJC
7782-49-2	Selenium, Total	ND	1.76	0.227	U	UJC
7440-22-4	Silver, Total	ND	0.880	0.249	U	UJC
7440-23-5	Sodium, Total	50.7	176	2.77	J	UJC
7440-28-0	Thallium, Total	ND	1.76	0.277	U	UJC
7440-62-2	Vanadium, Total	33.5	0.880	0.179		
7440-66-6	Zinc, Total	53.0	4.40	0.258		

SEP 21 2018

Initials: CR

Form 1
METALS

Client	: P. W. Grosser	Lab Number	: L1745804
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1745804-04	Date Collected	: 12/11/17 09:50
Client ID	: SB002 (7-9)	Date Received	: 12/12/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/20/17 19:40
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,7471B	Analyst	: EA
Lab File ID	: HG122017B	Instrument ID	: FIMS4
Sample Amount	: 0.399g	%Solids	: 89
Digestion Method	: EPA 7471B	Date Digested	: 12/20/17

		mg/kg				
CAS NO.	Parameter	Results	RL	MDL	Qualifier	
7439-97-6	Mercury, Total	ND	0.07	0.02	U	U

SEP 21 2018

Initials: CR

LDC #: 43079A4b
SDG #: L1745804
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Category B

Date: 9/20/18
Page: 1 of 1
Reviewer: ATL
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010C/7471B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	Instrument Calibration	SW	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	SW	
V.	Field Blanks	SW	Field blank 001 (From SDG #L1745804)
VI.	Matrix Spike/Matrix Spike Duplicates	SW	(2,3)
VII.	Duplicate sample analysis	N	
VIII.	Serial Dilution	SW	
IX.	Laboratory control samples	A	LCS
X.	Field Duplicates	N	
XI.	Sample Result Verification	A	MDL < sample < RL : Jdet
XII	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB002 (7-9) (2X due to high analytes)	L1745804-04	Soil	12/11/17
2	SB002 (7-9)MS	L1745804-04MS	Soil	12/11/17
3	SB002 (7-9)MSD	L1745804-04MSD	Soil	12/11/17
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

DC #: 43079-A4b

VALIDATION FINDINGS CHECKLIST

Reviewer: ATL
2nd Reviewer: G

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?			✓	
Were %RSD of isotopes in the tuning solution ≤5%?			✓	
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?	✓			
Were the low standard checks within 70-130%		✓		
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.	✓			
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?			✓	
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?	✓			
Were all percent differences (%Ds) < 10%?		✓		
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: ATL
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	S	[✓ Al], [✓ Sb], [✓ As], [✓ Ba], [✓ Be], [✓ Cd], [✓ Ca], [✓ Cr], [✓ Co], [✓ Cu], [✓ Fe], [✓ Pb], [✓ Mg], [✓ Mn], [✓ Hg], [✓ Ni], [✓ K], [✓ Se], [✓ Ag], [✓ Na], [✓ Tl], [✓ V], [✓ Zn], ~~[✓ Mo]~~, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
QC		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
2,3	S	[✓ Al], [✓ Sb], [✓ As], [✓ Ba], [✓ Be], [✓ Cd], [✓ Ca], [✓ Cr], [✓ Co], [✓ Cu], [✓ Fe], [✓ Pb], [✓ Mg], [✓ Mn], [✓ Hg], [✓ Ni], [✓ K], [✓ Se], [✓ Ag], [✓ Na], [✓ Tl], [✓ V], [✓ Zn], Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___

		Analysis Method
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ___ ___

Comments: Mercury by CVAA if performed

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: ATL
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Y N N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)? 70-130%

LEVEL IV ONLY:

Y N N/A Was a midrange cyanide standard distilled?

Y N N/A Are all correlation coefficients ≥0.995?

Y N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data
	12/20/17	CRI (10:01)	Fe	207 (70-130)	1	no qual (sample > 2x RL)
	12/20/17	CRI (10:01)	Na	10 (70-130)	1	J/UJ/P (detect)

Comments:

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: ATL
2nd Reviewer:

METHOD: Trace metals (EPA SW 864 Method 6010B/6020/7000)
Soil preparation factor applied: NA
Sample Concentration units, unless otherwise noted: mg/kg
Associated Samples: 1

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (mg/L)	Action Level									
Fe			0.0195										

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: ATL
2nd Reviewer:

METHOD: Trace Metals (EPA SW846 6010B/7000)

Blank units: mg/L **Associated sample units:** mg/kg
Sampling date: 12/11/17 Soil factor applied _____
Field blank type: (circle one) Field Blank / Rinsate / Other: FB Associated Samples: 1

Analyte	Blank ID	Sample Identification										
	Field Blank 001	Action Limit										
Ca	0.700											
Zn	0.002											

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Samples with analyte concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: ATL
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125~~ lab limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for samples?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	2/3	S	Cd	60 (75-125)	55 (75-125)		all	J/UJ/A (non-detect)
		S	Ca		161 (75-125)		all	Jdet/A (detect)
		S	K		134 (75-125)		all	Jdet/A (detect)
		S	Hg	142 (80-120)	142 (80-120)		all	Jdet/A (non-detect)

Comments: 2/3: Al, Fe, Mg, Mn > 4X

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
ICP Serial Dilution

Reviewer: ATL
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A If analyte concentrations were > 50X the MDL (ICP) ,or >100X the MDL (ICP/MS), was a serial dilution analyzed?
Y (N) N/A Were ICP serial dilution percent differences (%D) ≤10%?
Y (N) N/A Is there evidence of negative interference? If yes, professional judgement will be used to qualify the data.

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Diluted Sample ID	Matrix	Analyte	%D (Limits)	Associated Samples	Qualifications
	1	S	Ba	11 (≤10%)	1	J/UJ/A (detect)
		S	Fe	17 (≤10%)	1	J/UJ/A (detect)
		S	Mg	14 (≤10%)	1	J/UJ/A (detect)
		S	Mn	14 (≤10%)	1	J/UJ/A (detect)

Comments:

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: ATL
2nd Reviewer: [illegible]

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found ~~(ug/L)~~ mg/L	True ~~(ug/L)~~ mg/L	Recalculated %R	Reported %R	Acceptable (Y/N)
CRI	ICP (Low Level calibration) (12/20 @ 10:01)	Fe	0.4133	0.200	207	207	Y
	ICP/MS (Low Level calibration)						
ICV	ICP (Initial calibration) (12/20 @ 10:56)	Ca	0.4744	0.5000	95	95	Y
	ICP/MS (Initial calibration)						
ICV	CVAA (Initial calibration) 12/20 @ 18:25	Hg	0.003188	0.0030	106	106	Y
CCV	ICP (Continuing calibration) (12/20 @ 18:36)	K	5.065	5.0000	101	101	Y
	ICP/MS (Continuing calibration)						
CCV	CVAA (Continuing calibration) (12/20 @ 19:35)	Hg	0.001070	0.0100	107	107	Y

ICP-MS TUNE	Calculation	Mass	Actual (Mean Counts / Axis)	Required (Counts / Axis)	Recalculated %RSD	Acceptable (Y/N)
	Mass Axis			± 0.1 AMU	NA	
	%RSD			≤ 5% RSD		

Comments:

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ATL
2nd Reviewer: C

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check 12/20 @ 09:57	Mg	20.87 mg/L	22.5 mg/L	93	93	Y
LCS	Laboratory control sample 12/20 @ 18:07	Cr	89.29 mg/kg	101 mg/kg	88	88	Y
2	Matrix spike 12/20 @ 18:16	Cd	(SSR-SR) 2.72 mg/kg	4.56 mg/kg	60	60	Y
2/3	Duplicate 12/20 @ 18:21	Cd	2.44 mg/kg	2.72 mg/kg	11	11	Y
1	Post digestion spike 12/20 @ 22:18	K	657 mg/kg	880 mg/kg	75	74	Y
1	ICP serial dilution 12/20 @ 18:45	Ba	74.9 mg/kg	67.2 mg/kg	11	11	Y

Comments: _____

LDC #: 43079A4b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: ATL
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
Y N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for Ba were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

Recalculation: #1

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

$$0.7630 \times 2 \times \frac{50}{1.275 \times 0.89} = 67.2395 \approx 67.2$$

#	Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
	1	Ba (12/20 @ 18:12)	67.2	67.2	Y
	1	Hg (12/20 @ 19:40)	ND	ND	Y

Note:

Site: Williamsbridge Gardens
Laboratory: Alpha Analytical, Inc.
Report No.: L1745989
Reviewer: Felomina Tanguilig and Christina Rink/Laboratory Data Consultants for P.W. Grosser Consulting
Date: September 20, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
VP-001	L1745989-01	VOC
VP-001DUP	L1745989-01DUP	VOC

Associated QC Samples(s):
Field/Trip Blanks: None Associated
Field Duplicate pair: None Associated

The above-listed air samples were collected on December 12, 2017 and were analyzed for volatile organic compounds (VOCs) by method TO-15. The data validation was performed in accordance with the USEPA Region 2 *Analysis of Volatile Organic Compounds in Air Contained Canisters*, SOP HW-31, Revision 6 (September 2016) and USEPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review,* EPA 540-R-2017-002 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The organic data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tunes
- Initial and Continuing Calibrations
- Blanks
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Duplicate Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits and Data Assessment
- Sample Quantitation and Compound Identification

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times and Sample Preservation

All technical holding time requirements were met.

GC/MS Tunes

All criteria were met.

Initial and Continuing Calibrations

Initial calibration:

All criteria were met.

Continuing calibration:

Compounds that did not meet criteria are summarized in the following table.

Date	Instrument ID	Compound	CC %D	Associated Samples		Validation Action
12/19/17	CCV	1,2,4-Trichlorobenzene	42.2	VP-001	XX	UJ nondetects
		Hexachlorobutadiene	47.7		XX	UJ nondetects

X = Initial calibration (IC) relative standard deviation (%RSD) > 30; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The 1,2,4-trichlorobenzene and hexachlorobutadiene results were estimated due to continuing calibration exceedances. The bias cannot be determined. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

Blanks

Contamination was not detected in the method blanks.

A field blank was not associated with this sample set. Validation action was not required on this basis.

MS/MSD Results

MS/MSD analyses were not associated with this sample set. Validation action was not required on this basis.

Laboratory Duplicate Results

Laboratory duplicates were performed on sample VP-001 for VOC analysis. All criteria were met.

LCS Results

The following table lists the compounds recovered outside of control limits in the VOC analysis and the resulting validation actions.

LCS ID	Compound	LCS %R (Limits)	Affected Sample	Validation Action
WG1074501-3	Benzyl chloride 1,2,4-Trichlorobenzene Hexachlorobutadiene	134 (70-130) 141 (70-130) 143 (70-130)	VP-001	None

Validation action was not required for benzyl chloride, 1,2,4-trichlorobenzene, and hexachlorobutadiene due to high LCS percent recoveries as positive results only are affected and these compounds were not detected in the associated sample.

Interal Standards

All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

Quantitation Limits and Data Assessment

No results were reported below the reporting limit (RL) and above the method detection limit (MDL) in the VOC analysis.

Dilutions were not required for VOC analysis.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

Form 1
Volatile Organics

Client	: P. W. Grosser	Lab Number	: L1745989
Project Name	:	Project Number	: BBU1702
Lab ID	: L1745989-01	Date Collected	: 12/12/17 10:24
Client ID	: VP001	Date Received	: 12/13/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/19/17 21:24
Sample Matrix	: SOIL_VAPOR	Dilution Factor	: 1
Analytical Method	: 48,TO-15	Analyst	: RY
Lab File ID	: R251570	Instrument ID	: AIRPIANO2
Sample Amount	: 250 ml	GC Column	: RTX-1

		ppbV			ug/m3			
CAS NO.	Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier
75-71-8	Dichlorodifluoromethane	0.324	0.200	--	1.60	0.989	--	
74-87-3	Chloromethane	ND	0.200	--	ND	0.413	--	U
76-14-2	Freon-114	ND	0.200	--	ND	1.40	--	U
75-01-4	Vinyl chloride	ND	0.200	--	ND	0.511	--	U
106-99-0	1,3-Butadiene	4.97	0.200	--	11.0	0.442	--	
74-83-9	Bromomethane	ND	0.200	--	ND	0.777	--	U
75-00-3	Chloroethane	ND	0.200	--	ND	0.528	--	U
64-17-5	Ethanol	5.65	5.00	--	10.6	9.42	--	
593-60-2	Vinyl bromide	ND	0.200	--	ND	0.874	--	U
67-64-1	Acetone	23.3	1.00	--	55.3	2.38	--	
75-69-4	Trichlorofluoromethane	0.289	0.200	--	1.62	1.12	--	
67-63-0	Isopropanol	ND	0.500	--	ND	1.23	--	U
75-35-4	1,1-Dichloroethene	ND	0.200	--	ND	0.793	--	U
75-65-0	Tertiary butyl Alcohol	1.11	0.500	--	3.36	1.52	--	
75-09-2	Methylene chloride	ND	0.500	--	ND	1.74	--	U
107-05-1	3-Chloropropene	ND	0.200	--	ND	0.626	--	U
75-15-0	Carbon disulfide	1.41	0.200	--	4.39	0.623	--	
76-13-1	Freon-113	ND	0.200	--	ND	1.53	--	U
156-60-5	trans-1,2-Dichloroethene	0.339	0.200	--	1.34	0.793	--	
75-34-3	1,1-Dichloroethane	ND	0.200	--	ND	0.809	--	U
1634-04-4	Methyl tert butyl ether	ND	0.200	--	ND	0.721	--	U
78-93-3	2-Butanone	11.0	0.500	--	32.4	1.47	--	
156-59-2	cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--	U
141-78-6	Ethyl Acetate	ND	0.500	--	ND	1.80	--	U
67-66-3	Chloroform	0.459	0.200	--	2.24	0.977	--	
109-99-9	Tetrahydrofuran	ND	0.500	--	ND	1.47	--	U
107-06-2	1,2-Dichloroethane	ND	0.200	--	ND	0.809	--	U
110-54-3	n-Hexane	2.19	0.200	--	7.72	0.705	--	

SEP 21 2018

Initials: CR

Form 1
Volatile Organics

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Project Name	:	Project Number	: BBU1702
Lab ID	: L1745989-01	Date Collected	: 12/12/17 10:24
Client ID	: VP001	Date Received	: 12/13/17
Sample Location	: 718 E. 212TH ST., BRONX, NY	Date Analyzed	: 12/19/17 21:24
Sample Matrix	: SOIL_VAPOR	Dilution Factor	: 1
Analytical Method	: 48,TO-15	Analyst	: RY
Lab File ID	: R251570	Instrument ID	: AIRPIANO2
Sample Amount	: 250 ml	GC Column	: RTX-1

		ppbV			ug/m3			
CAS NO.	Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier
71-55-6	1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--	U
71-43-2	Benzene	2.43	0.200	--	7.76	0.639	--	
56-23-5	Carbon tetrachloride	ND	0.200	--	ND	1.26	--	U
110-82-7	Cyclohexane	0.314	0.200	--	1.08	0.688	--	
78-87-5	1,2-Dichloropropane	ND	0.200	--	ND	0.924	--	U
75-27-4	Bromodichloromethane	ND	0.200	--	ND	1.34	--	U
123-91-1	1,4-Dioxane	ND	0.200	--	ND	0.721	--	U
79-01-6	Trichloroethene	ND	0.200	--	ND	1.07	--	U
540-84-1	2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--	U
142-82-5	Heptane	0.961	0.200	--	3.94	0.820	--	
10061-01-5	cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--	U
108-10-1	4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--	U
10061-02-6	trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--	U
79-00-5	1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--	U
108-88-3	Toluene	3.10	0.200	--	11.7	0.754	--	
591-78-6	2-Hexanone	1.60	0.200	--	6.56	0.820	--	
124-48-1	Dibromochloromethane	ND	0.200	--	ND	1.70	--	U
106-93-4	1,2-Dibromoethane	ND	0.200	--	ND	1.54	--	U
127-18-4	Tetrachloroethene	5.80	0.200	--	39.3	1.36	--	
108-90-7	Chlorobenzene	ND	0.200	--	ND	0.921	--	U
100-41-4	Ethylbenzene	0.790	0.200	--	3.43	0.869	--	
179601-23-1	p/m-Xylene	2.36	0.400	--	10.3	1.74	--	
75-25-2	Bromoform	ND	0.200	--	ND	2.07	--	U
100-42-5	Styrene	0.384	0.200	--	1.63	0.852	--	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--	U
95-47-6	o-Xylene	0.872	0.200	--	3.79	0.869	--	
622-96-8	4-Ethyltoluene	0.237	0.200	--	1.17	0.983	--	
108-67-8	1,3,5-Trimethylbenzene	0.337	0.200	--	1.66	0.983	--	

SEP 21 2018

Initials: CR

Form 1
Volatile Organics

Client	: P. W. Grosser	Lab Number	: L1745989
Project Name	:	Project Number	: BBU1702
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Analytical Method	: 48,TO-15	Analyst	: RY
Lab File ID	: R251570	Instrument ID	: AIRPIANO2
Sample Amount	: 250 ml	GC Column	: RTX-1

		ppbV			ug/m3				
CAS NO.	Parameter	Results	RL	MDL	Results	RL	MDL	Qualifier	
95-63-6	1,2,4-Trimethylbenzene	0.933	0.200	--	4.59	0.983	--		
100-44-7	Benzyl chloride	ND	0.200	--	ND	1.04	--	U	
541-73-1	1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--	U	
106-46-7	1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--	U	
95-50-1	1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--	U	
120-82-1	1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--	U	UJ
87-68-3	Hexachlorobutadiene	ND	0.200	--	ND	2.13	--	U	UJ

SEP 21 2018

Initials: CR

LDC #: 43079B48 **VALIDATION COMPLETENESS WORKSHEET** Date: 9/20/18
SDG #: L1745989 Category B Page: 1 of 1
Laboratory: Alpha Analytical, Inc. Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD/ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 30
V.	Laboratory Blanks/Canister Blanks per Batch	A/A	
VI.	Field blanks	N	
VII.	Surrogate spikes	N	
VIII.	Matrix spike/Matrix spike duplicates /DUP	N/A	
IX.	Laboratory control samples	SW	LCS
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	No Result < RL > MDL
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Leak Check Compounds	N	
XVI.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	VP-001	L1745989-01	Air	12/12/17
2	VP-001DUP	L1745989-01DUP	Air	12/12/17
3				
4				
5				
6				
7				

Notes:

	WG1074501-4						

LDC #: 43079B48

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FT
2nd Reviewer:

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was canister pressure criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 24 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 30%?	✓			
IIIb. Initial calibration verificattion				
Was an initial calibration verification standard analyzed after every ICAL for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?		✓		
V. Laboratory Blanks/Canister Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 24 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
Was a canister blank analyzed for every canister?	✓			
Was there contamination in the canister blanks? If yes, please see the Canister Blanks validation completeness worksheet.		✓		
VI. Field Blanks				
Were field blanks identified in this SDG?		✓		
Were target compounds detected in the field blanks?			✓	
VII. Surrogate spikes (Optional)				
Were all surrogate percent recoveries (%R) within QC limits?			✓	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Laboratory Duplicate				
Was a laboratory duplicate analyzed for this SDG?	✓			
Were the relative percent differences (RPD) within the QC limits?	✓			

LDC #: 43079 B48

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: FT
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within ± 40% from the associated calibration standard?	✓			
Were retention times within ± 20.0 seconds from the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 43079B48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?

Y N N/A Were all percent differences (%D) ≤ 30%?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤30.0%)	Associated Samples	Qualifications	
	12/19/17	CCV	KKK	42.2	All	J/UJ/P	ND
	1205PM		LLL	47.7	↓	↓	↓

LDC #: 43079B48

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	WG1074501-	MMMM	134 (70-130)	( )	( )	All	Jdw /P all MP
	3 LCS	KKK	141 (↓)	( )	( )	↓	↓
		LLL	143 (↓)	( )	( )	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
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			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 43079B48

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GCMS TO15

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:

Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 10 ppbvstd)	Recalculated (RRF 10 ppbv std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	10/26/2017	G	2.263	2.263	2.1634	2.1634	10.93	10.93
			V	1.184	1.184	1.1950	1.1950	6.45	6.45
			CC	4.953	4.953	4.8703	4.8703	3.24	3.24

LDC #: 43079 B48

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS VOA (EPA TO-15)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV 1205	12/19/17	G	2.1634	2.156	2.156	0.3	0.3
			√	1.1950	1.145	1.145	4.2	4.2
			CC	4.8703	5.269	5.269	8.2	8.2
2								
3								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079B48

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: EJ
2nd reviewer:

METHOD: GC/MS VOA (EPA Method TO-15)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. #1, K:

Conc. = $\frac{8677\,(10)}{(132904)(1.4227)}$

= 0.4589 ppbV

#	Sample ID	Compound	Reported Concentration ( )	Calculated Concentration ( )	Qualification
	#1	K	0.459 ppb	0.4589 ppbV	
		↓	2.24 ug/m³	2.2397 ug/m³	
	ug/m³ =	$\frac{(119.38)(0.4589)}{24.45}$			
	=	2.2397			

Site: Williamsbridge Gardens
Laboratory: Alpha Analytical, Inc.
Report No.: L1746315
Reviewer: Felomina Tanguilig and Christina Rink/Laboratory Data Consultants for P.W. Grosser Consulting
Date: September 20, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
SB006 (0-2)	L1746315-03	VOC, SVOC, Pesticide, PCB
SB006 (0-2)MS	L1746315-03MS	VOC, SVOC, Pesticide, PCB
SB006 (0-2)MSD	L1746315-03MSD	VOC, SVOC, Pesticide, PCB

Associated QC Samples(s):
Field/Trip Blanks: Trip Blank, Field Blank 002
Field Duplicate pair: None Associated

The above-listed soil samples were collected on December 14, 2017 and were analyzed for volatile organic compounds (VOCs) by SW-846 method 8260C, semivolatile organic compounds (SVOCs) by SW-846 method 8270D, chlorinated pesticides by SW-846 method 8081B, and polychlorinated biphenyls (PCBs) by SW-846 method 8082A. The data validation was performed in accordance with the USEPA Region 2 *Standard Operating Procedure for Validating Volatile Organic Compounds By Gas Chromatography/Mass Spectrometry,* SOP HW-24, Revision 4 (October 2014), the USEPA Region 2 *Standard Operating Procedure for Semivolatile Data Validation,* SOP HW-35A, Revision 1 (September 2016), the USEPA Region 2 *Standard Operating Procedure for Validating Pesticide Compounds, Organochlorine Pesticides by Gas Chromatography SW-846 Method 8081B,* SOP HW-44, Revision 1 (October 2006), the USEPA Region 2 *Standard Operating Procedure for Validating PCB Compounds, PCBs by Gas Chromatography SW-846 Method 8082A,* SOP HW-45, Revision 1 (October 2006), and the USEPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review,* EPA 540-R-2017-002 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The organic data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tunes
- GC/Electron Capture Detector (GC/ECD) Instrument Performance Checks
- Initial and Continuing Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Moisture Content
- Field Duplicate Results
- Quantitation Limits and Data Assessment
- Sample Quantitation and Compound Identification

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers with the exception listed below.

The SVOC nondetect results for 2,4-dinitrophenol, 4,6-dinitro-o-cresol, and benzoic acid in sample SB006 (0-2) were rejected (R) due to severely low MS/MSD percent recoveries. The results are not usable for project objectives, which may have a major impact on the data usability.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times and Sample Preservation

All technical holding time requirements were met.

GC/MS Tunes

VOC and SVOC

All criteria were met.

GC/ECD Instrument Performance Checks

Pesticide and PCB

All criteria were met.

Initial and Continuing Calibrations

VOC

Initial calibration:

Compounds that did not meet criteria are summarized in the following table.

Date	Instrument ID	Compound	RRF (Limits)	Associated Samples		Validation Action
12/24/17	ICAL-VOA100	1,4-Dioxane	0.002 (≥0.005)	SB006 (0-2)	+	UJ nondetects

X = Initial calibration (IC) relative standard deviation (%RSD) > 30; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The 1,4-dioxane result was estimated due to response factor exceedance. The bias cannot be determined. The result can be used for project objectives as a nondetect with an estimated quantitation limit (UJ) which may have a minor impact on the data usability.

Continuing calibration:

Compounds that did not meet criteria are summarized in the following table.

Date	Instrument ID	Compound	CC %D	Associated Samples		Validation Action
12/24/17	CCV-VOA100	Chloromethane	25.9	SB006 (0-2)	XX	UJ nondetects
		Methylene chloride	23.4		XX	UJ nondetects

X = Initial calibration (IC) relative standard deviation (%RSD) > 20; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 20; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The chloromethane and methylene chloride results were estimated due to continuing calibration exceedances. The bias cannot be determined. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

SVOC

Initial calibration:

All criteria were met.

Continuing calibration:

Compounds that did not meet criteria are summarized in the following table.

Date	Instrument ID	Compound	CC %D	Associated Samples		Validation Action
10/23/17	CCV-SV103	Benzoic acid	24.3	SB006 (0-2)	XX	UJ nondetects
		Hexachlorocyclopentadiene	21.7		XX	UJ nondetects

X = Initial calibration (IC) relative standard deviation (%RSD) > 20; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 20; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The benzoic acid and hexachlorocyclopentadiene results were estimated due to continuing calibration exceedances. The bias cannot be determined. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

Pesticide and PCB

All criteria were met.

Blanks

VOC

Contamination was detected in the associated VOC method blank samples. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action Levels (ALs) were established at <2x RL (for common contaminants) and <RL (for other contaminants) of the concentrations detected. The following table summarizes the contamination detected.

Blank ID	Compound	Level Detected	Action Level	Associated Samples
WG1076365-10Blank	Ethylbenzene	0.19 ug/Kg	RL	SB002 (7-9)
	m,p-Xylene	0.48 ug/Kg	RL	
	Xylenes, total	0.48 ug/Kg	RL	
	n-Propylbenzene	0.30 ug/Kg	RL	
	1,3,5-Trimethylbenzene	0.36 ug/Kg	RL	
	1,2,3-Trichlorobenzene	0.80 ug/Kg	RL	
	p-Ethyltoluene	0.84 ug/Kg	RL	

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample ID	Compound	Level Detected	Validation Action
SB002 (7-9)	1,3,5-Trimethylbenzene	0.26 ug/Kg	6.9U ug/Kg
	p-Ethyltoluene	0.63 ug/Kg	5.5U ug/Kg

These results can be used for project objectives as nondetects (U) which may have a minor impact on the data usability.

No positive results were found in the trip blank sample Trip Blank and field blank sample Field Blank 001 for VOC analysis.

SVOC

Contamination was not detected in the method blanks.

Contamination was detected in the field blank sample Field Blank 002 for the SVOC analysis. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action Levels (ALs) were established at <2x RL (for common contaminants) and <RL (for other contaminants) of the concentrations detected. The following table summarizes the contamination detected.

Field Blank ID	Compound	Level Detected	Action Level	Associated Samples
Field Blank 002	Benzyl alcohol	0.88 ug/L	RL	SB006 (0-2)
	4-Chloroaniline	0.86 ug/L	RL	

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.

No samples were qualified since the associated sample results were nondetect.

Pesticide

Contamination was not detected in the method blanks.

No positive results were found in the field blank sample Field Blank 001 for pesticide analysis.

PCB

Contamination was not detected in the method blanks.

Contamination was detected in the field blank sample Field Blank 002 for the PCB analysis. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action Levels (ALs) were established at the reporting limit (RL) for contaminants. The following table summarizes the contamination detected.

Field Blank ID	Compound	Level Detected	Action Level	Associated Samples
Field Blank 002	Aroclor-1260 Total PCBs	0.039 ug/L 0.039 ug/L	RL RL	SB006 (0-2)

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.

Qualified sample results are listed in the table below.

Sample ID	Compound	Level Detected	Validation Action
SB006 (0-2)	Aroclor-1260 Total PCBs	21.3 ug/L 85.4 ug/L	36.6U ug/L 85.4J ug/L

These results can be used for project objectives as nondetect (U) or estimated (J) which may have a minor impact on the data usability.

Surrogate Recoveries

All criteria were met.

MS/MSD Results

VOC

MS/MSD analyses were performed on sample SB006 (0-2) for VOC analysis. The following table lists the compounds recovered outside of control limits in the MS/MSD analyses and the resulting actions.

Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
Methylene chloride	58 (70-130)	54 (70-130)	-	SB006 (0-2)	J detects/UJ nondetects
Chloroform	67 (70-130)	58 (70-130)	-		J detects/UJ nondetects
1,2-Dichloropropane	69 (70-130)	65 (70-130)	-		J detects/UJ nondetects
Dibromochloromethane	44 (70-130)	40 (70-130)	-		J detects/UJ nondetects
1,1,2-Trichloroethane	49 (70-130)	47 (70-130)	-		J detects/UJ nondetects
Tetrachloroethene	40 (70-130)	35 (70-130)	-		J detects/UJ nondetects
Chlorobenzene	22 (70-130)	18 (70-130)	-		J detects/UJ nondetects
1,2-Dichloroethane	57 (70-130)	50 (70-130)	-		J detects/UJ nondetects
Bromodichloromethane	53 (70-130)	48 (70-130)	-		J detects/UJ nondetects
trans-1,3-Dichloropropene	24 (70-130)	17 (70-130)	-		J detects/UJ nondetects
cis-1,3-Dichloropropene	32 (70-130)	23 (70-130)	-		J detects/UJ nondetects
1,1-Dichloropropene	66 (70-130)	54 (70-130)	-		J detects/UJ nondetects
Bromoform	41 (70-130)	38 (70-130)	-		J detects/UJ nondetects
1,1,2,2-Tetrachloroethane	34 (70-130)	16 (70-130)	-		J detects/UJ nondetects
Benzene	59 (70-130)	52 (70-130)	-		J detects/UJ nondetects
Toluene	38 (70-130)	32 (70-130)	-		J detects/UJ nondetects
Ethylbenzene	25 (70-130)	22 (70-130)	-		J detects/UJ nondetects
trans-1,2-Dichloroethene	58 (70-130)	44 (70-130)	-		J detects/UJ nondetects
Trichloroethene	55 (70-130)	53 (70-130)	-		J detects/UJ nondetects
1,2-Dichlorobenzene	12 (70-130)	12 (70-130)	-		J detects/UJ nondetects
1,3-Dichlorobenzene	10 (70-130)	10 (70-130)	-		J detects/UJ nondetects
1,4-Dichlorobenzene	9 (70-130)	9 (70-130)	-		J detects/UJ nondetects
m,p-Xylene	22 (70-130)	20 (70-130)	-		J detects/UJ nondetects
o-Xylene	25 (70-130)	25 (70-130)	-		J detects/UJ nondetects
cis-1,2-Dichloroethene	51 (70-130)	40 (70-130)	-		J detects/UJ nondetects
Dibromomethane	39 (70-130)	33 (70-130)	-		J detects/UJ nondetects
Styrene	15 (70-130)	12 (70-130)	-		J detects/UJ nondetects
Carbon disulfide	-	53 (59-130)	-		J detects/UJ nondetects
Vinyl acetate	17 (70-130)	16 (70-130)	-		J detects/UJ nondetects
1,2,3-Trichloropropane	44 (68-130)	39 (68-130)	-		J detects/UJ nondetects
2-Hexanone	62 (70-130)	58 (70-130)	-		J detects/UJ nondetects
Bromochloromethane	53 (70-130)	47 (70-130)	-		J detects/UJ nondetects
1,2-Dibromoethane	30 (70-130)	24 (70-130)	-		J detects/UJ nondetects
1,3-Dichloropropane	40 (69-130)	35 (69-130)	-		J detects/UJ nondetects
1,1,1,2-Tetrachloroethane	48 (70-130)	48 (70-130)	-		J detects/UJ nondetects
Bromobenzene	16 (70-130)	14 (70-130)	-		J detects/UJ nondetects
n-Butylbenzene	7 (70-130)	9 (70-130)	-		J detects/UJ nondetects
sec-Butylbenzene	14 (70-130)	18 (70-130)	-		J detects/UJ nondetects
tert-Butylbenzene	20 (70-130)	26 (70-130)	-		J detects/UJ nondetects
o-Chlorotoluene	17 (70-130)	14 (70-130)	-		J detects/UJ nondetects
p-Chlorotoluene	11 (70-130)	11 (70-130)	-		J detects/UJ nondetects
1,2-Dibromo-3-chloropropane	35 (68-130)	31 (68-130)	-		J detects/UJ nondetects
Hexachlorobutadiene	7 (67-130)	14 (67-130)	-		J detects/UJ nondetects
Isopropylbenzene	22 (70-130)	25 (70-130)	-		J detects/UJ nondetects
p-Isopropyltoluene	10 (70-130)	14 (70-130)	-		J detects/UJ nondetects
Naphthalene	10 (70-130)	8 (70-130)	-		J detects/UJ nondetects
n-Propylbenzene	14 (70-130)	15 (70-130)	-		J detects/UJ nondetects
1,2,3-Trichlorobenzene	8 (70-130)	8 (70-130)	-		J detects/UJ nondetects
1,2,4-Trichlorobenzene	7 (70-130)	6 (70-130)	-		J detects/UJ nondetects
1,3,5-Trimethylbenzene	16 (70-130)	20 (70-130)	-		J detects/UJ nondetects
1,2,4-Trimethylbenzene	14 (70-130)	16 (70-130)	-		J detects/UJ nondetects
p-Diethylbenzene	7 (70-130)	9 (70-130)	-		J detects/UJ nondetects
p-Ethyltoluene	13 (70-130)	14 (70-130)	-		J detects/UJ nondetects

Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
1,2,4,5-Tetramethylbenzene	9 (70-130)	12 (70-130)	-	SB006 (0-2)	J detects/UJ nondetects
trans-1,3-Dichloropropene	-	-	37 (≤30)	SB002 (7-9)	None
cis-1,3-Dichloropropene	-	-	35 (≤30)		
1,1,2,2-Tetrachloroethane	-	-	72 (≤30)		
Chloroethane	-	-	48 (≤30)		
trans-1,2-Dichloroethene	-	-	31 (≤30)		
Hexachlorobutadiene	-	-	59 (≤30)		

- Within control limits

The results listed above may be biased low due to low MS/MSD percent recoveries. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

Validation action was not required for trans-1,3-dichloropropene, cis-1,3-dichloropropene, 1,1,2,2-tetrachloroethane, chloroethane, trans-1,2-dichloroethene, and hexachlorobutadiene due to MS/MSD relative percent difference exceedances as positive results only are affected and these compounds were not detected in the associated sample.

SVOC

MS/MSD analyses were performed on sample SB006 (0-2) for SVOC analysis. The following table lists the compounds recovered outside of control limits in the MS/MSD analyses and the resulting actions.

Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
1,2,4-Trichlorobenzene	-	110 (38-107)	-	SB006 (0-2)	None
1,4-Dichlorobenzene	-	110 (28-104)	-		
Biphenyl	-	120 (54-104)	-		
1,2,4,5-Tetrachlorobenzene	-	120 (40-117)	-		
p-Chloro-m-cresol	-	130 (26-103)	-		
Phenol	-	110 (26-90)	-		
3,3'-Dichlorobenzidine	39 (40-140)	-	-	SB006 (0-2)	UJ nondetects
Hexachlorocyclopentadiene	39 (40-140)	-	-		UJ nondetects
Pentachlorophenol	-	16 (17-109)	-		UJ nondetects
Fluoranthene	-	240 (40-140)	-	SB006 (0-2)	J detects
Benzo(a)anthracene	-	160 (40-140)	-		J detects
Benzo(a)pyrene	-	150 (40-140)	-		J detects
Benzo(b)fluoranthene	-	170 (40-140)	-		J detects
Chrysene	-	160 (40-140)	-		J detects
Phenanthrene	-	190 (40-140)	-		J detects
Pyrene	-	220 (35-142)	-		J detects
Carbazole	-	130 (54-128)	-		J detects
2,4-Dinitrophenol	0 (4-130)	0 (4-130)	-	SB006 (0-2)	R nondetects
4,6-Dinitro-o-cresol	-	0 (10-130)	-		R nondetects
Benzoic acid	0 (10-110)	0 (10-110)	-		R nondetects

- Within control limits

Validation action was not required for 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, biphenyl, 1,2,4,5-tetrachlorobenzene, p-chloro-m-cresol, and phenol due to high MS/MSD percent recovery as positive results only are affected and this compound was not detected in the associated sample.

The 3,3'-dichlorobenzidine, hexachlorocyclopentadiene, and pentachlorophenol results may be biased low due to low MS/MSD percent recoveries. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

The fluoranthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, phenanthrene, pyrene, and carbazole results may be biased high due to high MS/MSD percent recoveries. The results can be used for project objectives as estimated values (J) which may have a minor impact on the data usability.

The SVOC nondetect results for 2,4-dinitrophenol, 4,6-dinitro-o-cresol, and benzoic acid in sample SB006 (0-2) were rejected (R) due to low MS/MSD percent recoveries. The results are not usable for project objectives, which may have a major impact on the data usability.

Pesticide and PCB

All criteria were met.

LCS Results

VOC, Pesticide, and PCB

All criteria were met.

SVOC

The following table lists the compounds recovered outside of control limits in the SVOC analysis and the resulting validation actions.

LCS ID	Compound	LCS %R (Limits)	LCS/D %R (Limits)	RPD (Limits)	Affected Sample	Validation Action
WG1075347-2/3	3,3'-Dichlorobenzidine	39 (40-140)	-	-	SB006 (0-2)	UJ nondetects
	4-Chloroaniline	38 (40-140)	-	-		UJ nondetects
WG1075347-2/3	4-Chloroaniline	-	-	104 (≤50)	SB006 (0-2)	UJ nondetects

- Within control limits

The 3,3'-dichlorobenzidine and 4-chloroaniline results may be biased low due to low LCS/LCSD percent recoveries. The results can be used for project objectives as nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

The 4-chloroaniline result was estimated due to LCS/LCSD relative percent difference exceedance. The bias cannot be determined. The result can be used for project objectives as a nondetect with an estimated quantitation limit (UJ) which may have a minor impact on the data usability.

Interal Standards

All criteria were met.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

Quantitation Limits and Data Assessment

Results were reported which were below the reporting limit (RL) and above the method detection limit (MDL) in the VOC, SVOC, pesticide, and PCB analyses. These results were qualified as estimated (J) by the laboratory.

Dilutions were not required for VOC, SVOC, pesticide, and PCB analyses.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

The following table lists the GC dual column RPDs for pesticide analysis which were outside the control limit of 40% and the resulting actions. The direction of the bias cannot be determined from this nonconformance. All results are usable as estimated values (J).

Sample	Compound	RPD (%)	Validation Actions
SB006 (0-2)	delta-BHC	104	J detects
	trans-Chlordane	130	J detects
	4,4'-DDE	50	J detects

The following table lists the GC dual column RPDs for PCB analysis which were outside the control limit of 40% and the resulting actions. The direction of the bias cannot be determined from this nonconformance. All results are usable as estimated values (J).

Sample	Compound	RPD (%)	Validation Actions
SB006 (0-2)	Aroclor-1254	107	J detects

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

Form 1
VOA

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/24/17 19:05
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,8260C	Analyst	: MV
Lab File ID	: V00171224A24	Instrument ID	: VOA100
Sample Amount	: 4.2 g	GC Column	: RTX-VMS
Level	: LOW	%Solids	: 87
Extract Volume (MeOH)	: N/A	Injection Volume	: N/A

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier	
75-09-2	Methylene chloride	ND	14	2.3	U	UJ
75-34-3	1,1-Dichloroethane	ND	2.1	0.37	U	U
67-66-3	Chloroform	ND	2.1	0.51	U	UJ
56-23-5	Carbon tetrachloride	ND	1.4	0.47	U	U
78-87-5	1,2-Dichloropropane	ND	4.8	0.31	U	UJ
124-48-1	Dibromochloromethane	ND	1.4	0.24	U	UJ
79-00-5	1,1,2-Trichloroethane	ND	2.1	0.43	U	UJ
127-18-4	Tetrachloroethene	ND	1.4	0.42	U	UJ
108-90-7	Chlorobenzene	ND	1.4	0.48	U	UJ
75-69-4	Trichlorofluoromethane	ND	6.9	0.57	U	U
107-06-2	1,2-Dichloroethane	ND	1.4	0.34	U	UJ
71-55-6	1,1,1-Trichloroethane	ND	1.4	0.48	U	U
75-27-4	Bromodichloromethane	ND	1.4	0.42	U	UJ
10061-02-6	trans-1,3-Dichloropropene	ND	1.4	0.29	U	UJ
10061-01-5	cis-1,3-Dichloropropene	ND	1.4	0.32	U	UJ
542-75-6	1,3-Dichloropropene, Total	ND	1.4	0.29	U	U
563-58-6	1,1-Dichloropropene	ND	6.9	0.45	U	UJ
75-25-2	Bromoform	ND	5.5	0.33	U	UJ
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.4	0.41	U	UJ
71-43-2	Benzene	ND	1.4	0.26	U	UJ
108-88-3	Toluene	ND	2.1	0.27	U	UJ
100-41-4	Ethylbenzene	ND	1.4	0.23	U	UJ
74-87-3	Chloromethane	ND	6.9	0.60	U	UJ
74-83-9	Bromomethane	ND	2.8	0.46	U	U
75-01-4	Vinyl chloride	ND	2.8	0.43	U	
75-00-3	Chloroethane	ND	2.8	0.43	U	
75-35-4	1,1-Dichloroethene	ND	1.4	0.51	U	

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Form 1
VOA

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/24/17 19:05
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,8260C	Analyst	: MV
Lab File ID	: V00171224A24	Instrument ID	: VOA100
Sample Amount	: 4.2 g	GC Column	: RTX-VMS
Level	: LOW	%Solids	: 87
Extract Volume (MeOH)	: N/A	Injection Volume	: N/A

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier	
156-60-5	trans-1,2-Dichloroethene	ND	2.1	0.33	U	UJ
79-01-6	Trichloroethene	ND	1.4	0.42	U	UJ
95-50-1	1,2-Dichlorobenzene	ND	6.9	0.25	U	UJ
541-73-1	1,3-Dichlorobenzene	ND	6.9	0.30	U	UJ
106-46-7	1,4-Dichlorobenzene	ND	6.9	0.25	U	UJ
1634-04-4	Methyl tert butyl ether	ND	2.8	0.21	U	U
179601-23-1	p/m-Xylene	ND	2.8	0.48	U	UJ
95-47-6	o-Xylene	ND	2.8	0.46	U	UJ
1330-20-7	Xylenes, Total	ND	2.8	0.46	U	U
156-59-2	cis-1,2-Dichloroethene	ND	1.4	0.47	U	UJ
540-59-0	1,2-Dichloroethene, Total	ND	1.4	0.33	U	U
74-95-3	Dibromomethane	ND	14	0.33	U	UJ
100-42-5	Styrene	ND	2.8	0.55	U	UJ
75-71-8	Dichlorodifluoromethane	ND	14	0.69	U	U
67-64-1	Acetone	44	14	3.2		
75-15-0	Carbon disulfide	2.0	14	1.5	J	J
78-93-3	2-Butanone	ND	14	0.95	U	U
108-05-4	Vinyl acetate	ND	14	0.21	U	UJ
108-10-1	4-Methyl-2-pentanone	ND	14	0.34	U	U
96-18-4	1,2,3-Trichloropropane	ND	14	0.24	U	UJ
591-78-6	2-Hexanone	ND	14	0.92	U	UJ
74-97-5	Bromochloromethane	ND	6.9	0.49	U	UJ
594-20-7	2,2-Dichloropropane	ND	6.9	0.62	U	U
106-93-4	1,2-Dibromoethane	ND	5.5	0.27	U	UJ
142-28-9	1,3-Dichloropropane	ND	6.9	0.25	U	UJ
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.4	0.44	U	UJ
108-86-1	Bromobenzene	ND	6.9	0.30	U	UJ

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Form 1
VOA

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/24/17 19:05
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,8260C	Analyst	: MV
Lab File ID	: V00171224A24	Instrument ID	: VOA100
Sample Amount	: 4.2 g	GC Column	: RTX-VMS
Level	: LOW	%Solids	: 87
Extract Volume (MeOH)	: N/A	Injection Volume	: N/A

		ug/Kg				
CAS NO.	Parameter	Results	RL	MDL	Qualifier	
104-51-8	n-Butylbenzene	ND	1.4	0.31	U	UJ
135-98-8	sec-Butylbenzene	ND	1.4	0.30	U	UJ
98-06-6	tert-Butylbenzene	ND	6.9	0.34	U	UJ
95-49-8	o-Chlorotoluene	ND	6.9	0.30	U	UJ
106-43-4	p-Chlorotoluene	ND	6.9	0.25	U	UJ
96-12-8	1,2-Dibromo-3-chloropropane	ND	6.9	0.54	U	UJ
87-68-3	Hexachlorobutadiene	ND	6.9	0.48	U	UJ
98-82-8	Isopropylbenzene	ND	1.4	0.27	U	UJ
99-87-6	p-Isopropyltoluene	ND	1.4	0.28	U	UJ
91-20-3	Naphthalene	ND	6.9	0.19	U	UJ
107-13-1	Acrylonitrile	ND	14	0.71	U	U
103-65-1	n-Propylbenzene	ND	1.4	0.30	U	UJ
87-61-6	1,2,3-Trichlorobenzene	ND	6.9	0.34	U	UJ
120-82-1	1,2,4-Trichlorobenzene	ND	6.9	0.30	U	UJ
108-67-8	1,3,5-Trimethylbenzene	0.26	6.9	0.22	J	6.9UJ
95-63-6	1,2,4-Trimethylbenzene	0.61	6.9	0.26	J	J
123-91-1	1,4-Dioxane	ND	55	20.	U	UJ
105-05-5	p-Diethylbenzene	ND	5.5	5.5	U	UJ
622-96-8	p-Ethyltoluene	0.63	5.5	0.32	J	5.5UJ
95-93-2	1,2,4,5-Tetramethylbenzene	ND	5.5	0.21	U	UJ
60-29-7	Ethyl ether	ND	6.9	0.36	U	U
110-57-6	trans-1,4-Dichloro-2-butene	ND	6.9	0.54	U	U

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Initials: CR

Form 1
SemiVolatile Organics

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRON	Date Analyzed	: 12/23/17 13:48
Sample Matrix	: SOIL	Date Extracted	: 12/21/17
Analytical Method	: 1,8270D	Dilution Factor	: 1
Lab File ID	: 46315-03	Analyst	: KR
Sample Amount	: 30.29 g	Instrument ID	: SV103
Extraction Method	: EPA 3546	GC Column	: RTX5-MS
Extract Volume	: 1000 uL	%Solids	: 87
GPC Cleanup	: N	Injection Volume	: 1 uL

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier	
83-32-9	Acenaphthene	62	150	20.	J	J
120-82-1	1,2,4-Trichlorobenzene	ND	190	22.	U	U
118-74-1	Hexachlorobenzene	ND	110	21.	U	
111-44-4	Bis(2-chloroethyl)ether	ND	170	26.	U	
91-58-7	2-Chloronaphthalene	ND	190	19.	U	
95-50-1	1,2-Dichlorobenzene	ND	190	34.	U	
541-73-1	1,3-Dichlorobenzene	ND	190	33.	U	
106-46-7	1,4-Dichlorobenzene	ND	190	33.	U	
91-94-1	3,3'-Dichlorobenzidine	ND	190	51.	U	UJ
121-14-2	2,4-Dinitrotoluene	ND	190	38.	U	U
606-20-2	2,6-Dinitrotoluene	ND	190	33.	U	U
206-44-0	Fluoranthene	1600	110	22.		J
7005-72-3	4-Chlorophenyl phenyl ether	ND	190	20.	U	U
101-55-3	4-Bromophenyl phenyl ether	ND	190	29.	U	
108-60-1	Bis(2-chloroisopropyl)ether	ND	230	32.	U	
111-91-1	Bis(2-chloroethoxy)methane	ND	210	19.	U	
87-68-3	Hexachlorobutadiene	ND	190	28.	U	
77-47-4	Hexachlorocyclopentadiene	ND	540	170	U	UJ
67-72-1	Hexachloroethane	ND	150	31.	U	U
78-59-1	Isophorone	ND	170	25.	U	U
91-20-3	Naphthalene	83	190	23.	J	J
98-95-3	Nitrobenzene	ND	170	28.	U	U
86-30-6	NDPA/DPA	ND	150	22.	U	
621-64-7	n-Nitrosodi-n-propylamine	ND	190	29.	U	

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Form 1
SemiVolatile Organics

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRON	Date Analyzed	: 12/23/17 13:48
Sample Matrix	: SOIL	Date Extracted	: 12/21/17
Analytical Method	: 1,8270D	Dilution Factor	: 1
Lab File ID	: 46315-03	Analyst	: KR
Sample Amount	: 30.29 g	Instrument ID	: SV103
Extraction Method	: EPA 3546	GC Column	: RTX5-MS
Extract Volume	: 1000 uL	%Solids	: 87
GPC Cleanup	: N	Injection Volume	: 1 uL

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier	
117-81-7	Bis(2-ethylhexyl)phthalate	ND	190	66.	U	U
85-68-7	Butyl benzyl phthalate	ND	190	48.	U	
84-74-2	Di-n-butylphthalate	ND	190	36.	U	
117-84-0	Di-n-octylphthalate	ND	190	65.	U	
84-66-2	Diethyl phthalate	ND	190	18.	U	
131-11-3	Dimethyl phthalate	ND	190	40.	U	
56-55-3	Benzo(a)anthracene	850	110	21.		J
50-32-8	Benzo(a)pyrene	800	150	46.		J
205-99-2	Benzo(b)fluoranthene	1000	110	32.		J
207-08-9	Benzo(k)fluoranthene	370	110	30.		
218-01-9	Chrysene	890	110	20.		J
208-96-8	Acenaphthylene	78	150	29.	J	J
120-12-7	Anthracene	180	110	37.		
191-24-2	Benzo(ghi)perylene	500	150	22.		
86-73-7	Fluorene	71	190	18.	J	J
85-01-8	Phenanthrene	850	110	23.		J
53-70-3	Dibenzo(a,h)anthracene	140	110	22.		
193-39-5	Indeno(1,2,3-cd)pyrene	540	150	27.		
129-00-0	Pyrene	1400	110	19.		J
92-52-4	Biphenyl	ND	440	44.	U	U
106-47-8	4-Chloroaniline	ND	190	35.	U	UJ
88-74-4	2-Nitroaniline	ND	190	37.	U	U
99-09-2	3-Nitroaniline	ND	190	36.	U	
100-01-6	4-Nitroaniline	ND	190	79.	U	

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Form 1
SemiVolatile Organics

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRON	Date Analyzed	: 12/23/17 13:48
Sample Matrix	: SOIL	Date Extracted	: 12/21/17
Analytical Method	: 1,8270D	Dilution Factor	: 1
Lab File ID	: 46315-03	Analyst	: KR
Sample Amount	: 30.29 g	Instrument ID	: SV103
Extraction Method	: EPA 3546	GC Column	: RTX5-MS
Extract Volume	: 1000 uL	%Solids	: 87
GPC Cleanup	: N	Injection Volume	: 1 uL

CAS NO.	Parameter	ug/Kg Results	RL	MDL	Qualifier	
132-64-9	Dibenzofuran	36	190	18.	J	J
91-57-6	2-Methylnaphthalene	84	230	23.	J	J
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	190	20.	U	U
98-86-2	Acetophenone	ND	190	24.	U	
88-06-2	2,4,6-Trichlorophenol	ND	110	36.	U	
59-50-7	p-Chloro-m-cresol	ND	190	28.	U	
95-57-8	2-Chlorophenol	ND	190	22.	U	
120-83-2	2,4-Dichlorophenol	ND	170	31.	U	
105-67-9	2,4-Dimethylphenol	ND	190	63.	U	
88-75-5	2-Nitrophenol	ND	410	72.	U	
100-02-7	4-Nitrophenol	ND	270	78.	U	
51-28-5	2,4-Dinitrophenol	ND	920	89.	U	R
534-52-1	4,6-Dinitro-o-cresol	ND	500	92.	U	R
87-86-5	Pentachlorophenol	ND	150	42.	U	UJ
108-95-2	Phenol	ND	190	29.	U	U
95-48-7	2-Methylphenol	ND	190	30.	U	
108-39-4/106-44-5	3-Methylphenol/4-Methylphenol	ND	270	30.	U	
95-95-4	2,4,5-Trichlorophenol	ND	190	36.	U	
65-85-0	Benzoic Acid	ND	620	190	U	R
100-51-6	Benzyl Alcohol	ND	190	58.	U	U
86-74-8	Carbazole	91	190	18.	J	J

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ALPHA ANALYTICAL

Initials: CR

Form 1
GC Organics

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/26/17 14:26
Sample Matrix	: SOIL	Date Extracted	: 12/21/17
Analytical Method	: 1,8081B	Dilution Factor	: 1
Lab File ID	: 10171226a-05	Analyst	: CD
Sample Amount	: 15.35 g	Instrument ID	: PEST10
Extraction Method	: EPA 3546	GC Column	: CLPPesticides
Extract Volume	: 1000 uL	%Solids	: 87
GPC Cleanup	: N	Injection Volume	: 1 uL
Sulfur Cleanup	: N		

		ug/Kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
319-86-8	Delta-BHC	1.56	1.81	0.354	J
58-89-9	Lindane	ND	0.753	0.337	U
319-84-6	Alpha-BHC	ND	0.753	0.214	U
319-85-7	Beta-BHC	ND	1.81	0.685	U
76-44-8	Heptachlor	ND	0.904	0.405	U
309-00-2	Aldrin	ND	1.81	0.636	U
1024-57-3	Heptachlor epoxide	ND	3.39	1.02	U
72-20-8	Endrin	ND	0.753	0.309	U
7421-93-4	Endrin aldehyde	ND	2.26	0.791	U
53494-70-5	Endrin ketone	ND	1.81	0.465	U
60-57-1	Dieldrin	ND	1.13	0.565	U
72-55-9	4,4'-DDE	5.60	1.81	0.418	P
50-29-3	4,4'-DDT	ND	3.39	1.45	U
959-98-8	Endosulfan I	ND	1.81	0.427	U
33213-65-9	Endosulfan II	ND	1.81	0.604	U
1031-07-8	Endosulfan sulfate	ND	0.753	0.358	U
72-43-5	Methoxychlor	ND	3.39	1.05	U
8001-35-2	Toxaphene	ND	33.9	9.49	U
5103-71-9	cis-Chlordane	1.10	2.26	0.630	J
57-74-9	Chlordane	ND	14.7	5.99	U

SEP 21 200

Initials: CR

Form 1
GC Organics

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/26/17 14:26
Sample Matrix	: SOIL	Date Extracted	: 12/21/17
Analytical Method	: 1,8081B	Dilution Factor	: 1
Lab File ID	: 10171226a-05	Analyst	: CD
Sample Amount	: 15.35 g	Instrument ID	: PEST10
Extraction Method	: EPA 3546	GC Column	: CLPPesticidesII
Extract Volume	: 1000 uL	%Solids	: 87
GPC Cleanup	: N	Injection Volume	: 1 uL
Sulfur Cleanup	: N		

		ug/Kg				
CAS NO.	Parameter	Results	RL	MDL	Qualifier	
72-54-8	4,4'-DDD	8.75	1.81	0.645		
5103-74-2	trans-Chlordane	0.910	2.26	0.596	JPI	J

SEP 21 2018

Initials: CR

ALPHA ANALYTICAL

Form 1
GC Organics

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/22/17 14:18
Sample Matrix	: SOIL	Date Extracted	: 12/21/17
Analytical Method	: 1,8082A	Dilution Factor	: 1
Lab File ID	: 13171222a-17	Analyst	: AWS
Sample Amount	: 15.8 g	Instrument ID	: PEST13
Extraction Method	: EPA 3546	GC Column	: CLP-Pesticide
Extract Volume	: 1000 uL	%Solids	: 87
GPC Cleanup	: N	Injection Volume	: 1 uL
Sulfur Cleanup	: Y		

		ug/Kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
12674-11-2	Aroclor 1016	ND	36.6	4.15	U
11104-28-2	Aroclor 1221	ND	36.6	5.57	U
11141-16-5	Aroclor 1232	ND	36.6	3.60	U
12672-29-6	Aroclor 1248	ND	36.6	4.10	U
11097-69-1	Aroclor 1254	26.6	36.6	2.98	J
37324-23-5	Aroclor 1262	ND	36.6	3.01	U

SEP 21 2018

Initials: CR

ALPHA ANALYTICAL

Form 1
GC Organics

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/22/17 14:18
Sample Matrix	: SOIL	Date Extracted	: 12/21/17
Analytical Method	: 1,8082A	Dilution Factor	: 1
Lab File ID	: 13171222a-17	Analyst	: AWS
Sample Amount	: 15.8 g	Instrument ID	: PEST13
Extraction Method	: EPA 3546	GC Column	: CLP-PesticideII
Extract Volume	: 1000 uL	%Solids	: 87
GPC Cleanup	: N	Injection Volume	: 1 uL
Sulfur Cleanup	: Y		

		ug/Kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
53469-21-9	Aroclor 1242	28.9	36.6	4.48	J J
11096-82-5	Aroclor 1260	21.3	36.6	3.82	J 36.6U
11100-14-4	Aroclor 1268	8.61	36.6	2.59	J J
1336-36-3	PCBs, Total	85.4	36.6	2.59	J J

SEP 21 2018

Initials: CR

LDC #: 43079C1
SDG #: L1746315
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Category B

Date: 9/20/18
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS Volatiles (EPA SW846 Method 8260C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	SW / A	%RSD ≤ 20, r² ICV ≤ 30
IV.	Continuing calibration	SW	CCV ≤ 20
V.	Laboratory Blanks	SW	
VI.	Field blanks	ND	FB= Field Blank 002 TB = Trip Blank
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	A	LCS/D
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Result ≥ RL > MDL = Jdet
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB006 (0-2)	L1746315-03	Soil	12/14/17
2	SB006 (0-2)MS	L1746315-03MS	Soil	12/14/17
3	SB006 (0-2)MSD	L1746315-03MSD	Soil	12/14/17
4				
5				
6				
7				
8				

Notes:

	WG1076365 - Blank (10)						

LDC #: 43079C1

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer:

Method: Volatiles (EPA SW 846 Method 8260C)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?	✓	✓		
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of > 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.	✓			
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			

LDC #: 43079C1

VALIDATION FINDINGS CHECKLIST

Reviewer: FT
2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane
C. Vinyl choride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO.1,1-Difluoroethane	O1. 3-Methylpentane
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3- Trimethylbutane
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methyl cyclohexane	T1. 2-Methylhexane
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.

LDC #: 43079C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤20 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: 20%)	Finding RRF (Limit: >0.05)	Associated Samples	Qualifications
	10/24/17	ICAL-VOA100	HHHH		0.002 (I 0.005)	All	J/UJ/A NO

INICAL.wpd

LDC #: Y3079C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	12/24/17	CCV - VOA 10U	A	25.9		All	J/UJ/A MD
	0906		E	23.4		↓	↓

LDC #: 43079C

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: FT
2nd Reviewer: a

METHOD: ✓ **GC** ___ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: _____ **Blank analysis date:** 12/24/17 **Associated samples:** All

Conc. units: ug/kg

Compound	Blank ID	Sample Identification						
	WG1076365-10 Blank	1						
EE	0.19							
RRR	0.48							
GG	0.48							
YY	0.30							
AAA	0.36		0.26 | 6.9M					
NNN	0.80							
p-Ethyltoluene	0.84		0.63 | 5.5M					

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____

Conc. units: _____

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

.LDC #: 43079C1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer: Q

METHOD : GC/MS VOA (EPA SW 846 Method 8260C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	2+3	refer	to following	pages ( )	( )	1	
			( )	( )	( )		
			( )	( )	( )	all %R = J/UJ/A	ND + DET
			( )	( )	( )		
			( )	( )	( )	all %RPD = J/A	all ND
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

Matrix Spike
Form 3

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Client Sample ID	: SB006 (0-2)	Matrix	: SOIL
Lab Sample ID	: L1746315-03	Analysis Date	: 12/24/17 19:05
Matrix Spike	: WG1076365-11	MS Analysis Date	: 12/24/17 19:31
Matrix Spike Dup	: WG1076365-12	MSD Analysis Date	: 12/24/17 19:57

		Matrix Spike Sample				Matrix Spike Duplicate					
Parameter	Sample Conc. (ug/kg)	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R		Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R		RPD	Recovery Limits	RPD Limit
Methylene chloride E	ND	105	61.	58	Q	103	56.	54	Q	9	70-130	30
1,1-Dichloroethane	ND	105	92.	88		103	86.	83		7	70-130	30
Chloroform K	ND	105	70.	67	Q	103	60.	58	Q	16	70-130	30
Carbon tetrachloride	ND	105	93.	88		103	87.	84		6	70-130	30
1,2-Dichloropropane Q	ND	105	73.	69	Q	103	68.	65	Q	7	70-130	30
Dibromochloromethane T	ND	105	46.	44	Q	103	41.	40	Q	11	70-130	30
1,1,2-Trichloroethane U	ND	105	51.	49	Q	103	48.	47	Q	6	70-130	30
Tetrachloroethene AA	ND	105	42.	40	Q	103	36.	35	Q	14	70-130	30
Chlorobenzene ✓ DD	ND	105	23.	22	Q	103	19.	18	Q	23	70-130	30
Trichlorofluoromethane	ND	105	110	106		103	99.	96		12	70-139	30
1,2-Dichloroethane L	ND	105	60.	57	Q	103	52.	50	Q	14	70-130	30
1,1,1-Trichloroethane	ND	105	93.	89		103	88.	86		6	70-130	30
Bromodichloromethane P	ND	105	56.	53	Q	103	49.	48	Q	12	70-130	30
trans-1,3-Dichloropropene W	ND	105	26.	24	Q	103	18.	17	Q	37 Q	70-130	30
cis-1,3-Dichloropropene R	ND	105	34.	32	Q	103	24.	23	Q	35 Q	70-130	30
1,1-Dichloropropene QQ	ND	105	70.	66	Q	103	56.	54	Q	22	70-130	30
Bromoform X	ND	105	43.	41	Q	103	39.	38	Q	9	70-130	30
1,1,2,2-Tetrachloroethane BB	ND	105	36.	34	Q	103	17.	16	Q	72 Q	70-130	30
Benzene ✓ V	ND	105	62.	59	Q	103	54.	52	Q	15	70-130	30
Toluene ✓ CC	ND	105	40.	38	Q	103	33.	32	Q	18	70-130	30
Ethylbenzene EE	ND	105	26.	25	Q	103	23.	22	Q	15	70-130	30
Chloromethane	ND	105	130	124		103	130	128		2	52-130	30
Bromomethane	ND	105	92.	88		103	79.	76		16	57-147	30
Vinyl chloride	ND	105	110	104		103	110	106		0	67-130	30

#2 + 3 use lab limits

Matrix Spike
Form 3

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Client Sample ID	: SB006 (0-2)	Matrix	: SOIL
Lab Sample ID	: L1746315-03	Analysis Date	: 12/24/17 19:05
Matrix Spike	: WG1076365-11	MS Analysis Date	: 12/24/17 19:31
Matrix Spike Dup	: WG1076365-12	MSD Analysis Date	: 12/24/17 19:57

		Matrix Spike Sample			Matrix Spike Duplicate					
Parameter	Sample Conc. (ug/kg)	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R	RPD	Recovery Limits	RPD Limit
Chloroethane D	ND	105	95.	91	103	58.	56	48 Q	50-151	30
1,1-Dichloroethene ✓	ND	105	92.	88	103	82.	80	11	65-135	30
trans-1,2-Dichloroethene PPP	ND	105	62.	58 Q	~~103~~	45.	44 Q	31 Q	70-130	30
Trichloroethene ✓S	ND	105	58.	55 Q	103	54.	53 Q	6	70-130	30
1,2-Dichlorobenzene JJJ	ND	105	12.	12 Q	103	12.	12 Q	3	70-130	30
1,3-Dichlorobenzene FFF	ND	105	11.	10 Q	103	10.	10 Q	6	70-130	30
1,4-Dichlorobenzene HHH	ND	105	9.8	9 Q	~~103~~	9.1	9 Q	8	70-130	30
Methyl tert butyl ether	ND	105	95.	90	103	92.	89	3	66-130	30
p/m-Xylene RRR	ND	210	47.	22 Q	~~206~~	42.	20 Q	11	70-130	30
o-Xylene SSS	ND	210	53.	25 Q	206	51.	25 Q	3	70-130	30
cis-1,2-Dichloroethene QQQ	ND	105	54.	51 Q	103	42.	40 Q	26	70-130	30
Dibromomethane RR	ND	105	41.	39 Q	103	34.	33 Q	20	70-130	30
Styrene FF	ND	210	32.	15 Q	206	25.	12 Q	26	70-130	30
Dichlorodifluoromethane	ND	105	120	113	103	120	116	1	30-146	30
Acetone	44	105	140	92	103	160	114	14	54-140	30
Carbon disulfide G	2.0J	105	70.	67	103	55.	53 Q	25	59-130	30
2-Butanone	ND	105	110	101	103	110	105	2	70-130	30
Vinyl acetate HH	ND	105	18.	17 Q	103	16.	16 Q	10	70-130	30
4-Methyl-2-pentanone	ND	105	87.	82	103	87.	84	0	70-130	30
1,2,3-Trichloropropane XX	ND	105	46.	44 Q	103	40.	39 Q	13	68-130	30
2-Hexanone Z	ND	105	66.	62 Q	103	60.	58 Q	8	70-130	30
Bromochloromethane PP	ND	105	56.	53 Q	103	48.	47 Q	15	70-130	30
2,2-Dichloropropane	ND	105	100	97	103	98.	95	4	70-130	30
1,2-Dibromoethane TT	ND	105	32.	30 Q	103	25.	24 Q	24	70-130	30

Matrix Spike
Form 3

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Client Sample ID	: SB006 (0-2)	Matrix	: SOIL
Lab Sample ID	: L1746315-03	Analysis Date	: 12/24/17 19:05
Matrix Spike	: WG1076365-11	MS Analysis Date	: 12/24/17 19:31
Matrix Spike Dup	: WG1076365-12	MSD Analysis Date	: 12/24/17 19:57

		Matrix Spike Sample				Matrix Spike Duplicate						
Parameter	Sample Conc. (ug/kg)	Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R		Spike Added (ug/kg)	Spike Conc. (ug/kg)	%R		RPD	Recovery Limits	RPD Limit
1,3-Dichloropropane SS	ND	105	42.	40	Q	103	36.	35	Q	14	69-130	30
1,1,1,2-Tetrachloroethane UU	ND	105	50.	48	Q	103	50.	48	Q	1	70-130	30
Bromobenzene WW	ND	105	17.	16	Q	103	15.	14	Q	14	70-130	30
n-Butylbenzene III	ND	105	7.1	7	Q	103	9.0	9	Q	23	70-130	30
sec-Butylbenzene EEE	ND	105	15.	14	Q	103	19.	18	Q	25	70-130	30
tert-Butylbenzene CCC	ND	105	21.	20	Q	103	27.	26	Q	26	70-130	30
o-Chlorotoluene	ND	105	18.	17	Q	103	15.	14	Q	17	70-130	30
p-Chlorotoluene	ND	105	12.	11	Q	103	11.	11	Q	6	70-130	30
1,2-Dibromo-3-chloropropane MM	ND	105	36.	35	Q	103	32.	31	Q	14	68-130	30
Hexachlorobutadiene LLL	ND	105	7.8	7	Q	103	14.	14	Q	59 Q	67-130	30
Isopropylbenzene VV	ND	105	24.	22	Q	103	26.	25	Q	9	70-130	30
p-Isopropyltoluene GGG	ND	105	11.	10	Q	103	15.	14	Q	30	70-130	30
Naphthalene MMM	ND	105	11.	10	Q	103	7.9	8	Q	28	70-130	30
Acrylonitrile	ND	105	92.	87		103	93.	90		1	70-130	30
n-Propylbenzene YY	ND	105	14.	14	Q	103	15.	15	Q	5	70-130	30
1,2,3-Trichlorobenzene NNN	ND	105	8.3	8	Q	103	8.3	8	Q	0	70-130	30
1,2,4-Trichlorobenzene KKK	ND	105	6.8	7	Q	103	6.4	6	Q	6	70-130	30
1,3,5-Trimethylbenzene AAA	0.26J	105	17.	16	Q	103	21.	20	Q	19	70-130	30
1,2,4-Trimethylbenzene DDD	0.61J	105	14.	14	Q	103	17.	16	Q	15	70-130	30
1,4-Dioxane	ND	5250	6000	113		5160	6400	124		7	65-136	30
p-Diethylbenzene	ND	105	7.5	7	Q	103	9.6	9	Q	25	70-130	30
p-Ethyltoluene	0.63J	105	13.	13	Q	103	15.	14	Q	9	70-130	30
1,2,4,5-Tetramethylbenzene	ND	105	9.6	9	Q	103	13.	12	Q	29	70-130	30
Ethyl ether	ND	105	79.	75		103	77.	75		3	67-130	30

LDC #: 43079C1

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GCMS 8260C

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:

Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 40 std)	Recalculated (RRF 40 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	10/24/2017	G	0.623	0.623	0.614	0.614	3.91	3.91
	VOA 100		CC	0.799	0.799	0.813	0.813	10.01	10.01
			BB	0.569	0.569	0.568	0.568	6.29	6.29

LDC #: 43079C1

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV VOA100 0906	12/24/17	G (1st internal standard)	0.614	0.593	0.593	3.4	3.4
			CC (2nd internal standard)	0.813	0.778	0.778	4.3	4.3
			BB (3rd internal standard)	0.568	0.530	0.530	6.7	6.7
			(4th internal standard)					
2			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
3			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					
4			(1st internal standard)					
			(2nd internal standard)					
			(3rd internal standard)					
			(4th internal standard)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079C1

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: A

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane	20.0	20.473	FT ~~104~~ 102	102	0
1,2-Dichloroethane-d4		21.458	~~102~~ 107	107	↓
Toluene-d8	↓	20.819	104	104	
Bromofluorobenzene		20.615	103	103	

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

Sample ID:

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Dibromofluoromethane					
1,2-Dichloroethane-d4					
Toluene-d8					
Bromofluorobenzene					

LDC #: 43079 C1

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS VOA (EPA Method 8260C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentration

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD sample: 2 + 3

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	105	103	ND	92.25	82.92	88	88	80	80	11	11
Trichloroethene				57.57	54.33	55	55	53	53	6	6
Benzene				61.97	53.53	~~62~~ 59	59	~~54~~ 52	52	15	15
Toluene				39.72	33.07	38	38	32	32	18	18
Chlorobenzene				23.43	18.55	22	22	18	18	23	23

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079 C1

VALIDATION FINDINGS WORKSHEET
Laboratory Control Sample Results Verification

Reviewer: FT
2nd Reviewer: Q

METHOD: GC/MS VOA (EPA Method 8260C)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratoy control sample and laboratory control sample duplicate (if applicable) were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * SSC/SA Where: SSC = Spiked sample concentration; SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboraotry control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS ID: WG1076365-8/9

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalculated
1,1-Dichloroethene	20.0	20.0	19.703	18.606	98	98	93	93	5	6
Trichloroethene	↓	↓	19.636	18.418	98	98	91	91	6	6
Benzene			18.820	17.816	94	94	89	89	5	5
Toluene			19.151	17.858	96	96	89	89	8	7
Chlorobenzene			19.721	18.628	99	99	93	93	6	6

Comments: Refer to Laboratory Control Sample findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079C1

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer:

METHOD: GC/MS VOA (EPA SW 846 Method 8260C)

Y N N/A Were all reported results recalculated and verified for all level IV samples?

Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. #1, G:

Conc. = $\frac{(8211)(20)(5)}{(185111)(0.614)(4.2)(0.865)}$

= 1.9885 ng/kg

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Qualification
	#1	G	2.0	1.9885	

LDC #: 43079C2a

SDG #: L1746315

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Category B

Date: 9/20/18

Page: 1 of 1

Reviewer: EJ

2nd Reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A/A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A/A	%RSD ≤20, r² ICV ≤30
IV.	Continuing calibration	SW	CCV ≤20
V.	Laboratory Blanks	A	
VI.	Field blanks	SW	FB = Field Blank-002
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	SW	
IX.	Laboratory control samples	SW	LCS ID
X.	Field duplicates	N	
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Result < RL > MDL = Jdet
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB006 (0-2)	L1746315-03	Soil	12/14/17
2	SB006 (0-2)MS	L1746315-03MS	Soil	12/14/17
3	SB006 (0-2)MSD	L1746315-03MSD	Soil	12/14/17
4				
5				
6				
7				
8				

Notes:

	WG1075347-1						

LDC #: 47079C2a

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FV
2nd Reviewer:

Method: Semivolatiles (EPA SW 846 Method 8270D)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/MS Instrument performance check				
Were the DFTPP performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 12 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20% and relative response factors (RRF) within method criteria?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
IIIb. Initial Calibration Verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?	✓			
Were all percent differences (%D) ≤ 20% and relative response factors (RRF) within method criteria?		✓		
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 12 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks were identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VII. Surrogate spikes				
Were all surrogate percent recovery (%R) within QC limits?	✓			
If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any percent recoveries (%R) was less than 10%, was a reanalysis performed to confirm %R ?			✓	

Validation Area	Yes	No	NA	Findings/Comments
VIII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?		✓		
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per analytical batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?		✓		
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Internal standards				
Were internal standard area counts within -50% to +100% of the associated calibration standard?	✓			
Were retention times within ± 30 seconds of the associated calibration standard?	✓			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	✓			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	✓			
Were chromatogram peaks verified and accounted for?	✓			
XIV. System performance				
System performance was found to be acceptable.	✓			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS SVOA

A. Phenol	AA. 2-Chloronaphthalene	AAA. Butylbenzylphthalate	AAAA. Dibenzothiophene	A1. N-Nitrosodiethylamine
B. Bis (2-chloroethyl) ether	BB. 2-Nitroaniline	BBB. 3,3'-Dichlorobenzidine	BBBB. Benzo(a)fluoranthene	B1. N-Nitrosodi-n-butylamine
C. 2-Chlorophenol	CC. Dimethylphthalate	CCC. Benzo(a)anthracene	CCCC. Benzo(b)fluorene	C1. N-Nitrosomethylethylamine
D. 1,3-Dichlorobenzene	DD. Acenaphthylene	DDD. Chrysene	DDDD. cis/trans-Decalin	D1. N-Nitrosomorpholine
E. 1,4-Dichlorobenzene	EE. 2,6-Dinitrotoluene	EEE. Bis(2-ethylhexyl)phthalate	EEEE. Biphenyl	E1. N-Nitrosopyrrolidine
F. 1,2-Dichlorobenzene	FF. 3-Nitroaniline	FFF. Di-n-octylphthalate	FFFF. Retene	F1. Phenacetin
G. 2-Methylphenol	GG. Acenaphthene	GGG. Benzo(b)fluoranthene	GGGG. C30-Hopane	G1. 2-Acetylaminofluorene
H. 2,2'-Oxybis(1-chloropropane)	HH. 2,4-Dinitrophenol	HHH. Benzo(k)fluoranthene	HHHH. 1-Methylphenanthrene	H1. Pronamide
I. 4-Methylphenol	II. 4-Nitrophenol	III. Benzo(a)pyrene	IIII. 1,4-Dioxane	I1. Methyl methanesulfonate
J. N-Nitroso-di-n-propylamine	JJ. Dibenzofuran	JJJ. Indeno(1,2,3-cd)pyrene	JJJJ. Acetophenone	J1. Ethyl methanesulfonate
K. Hexachloroethane	KK. 2,4-Dinitrotoluene	KKK. Dibenz(a,h)anthracene	KKKK. Atrazine	K1. o,o',o''-Triethylphosphorothioate
L. Nitrobenzene	LL. Diethylphthalate	LLL. Benzo(g,h,i)perylene	LLLL. Benzaldehyde	L1. n-Phenylene diamine
M. Isophorone	MM. 4-Chlorophenyl-phenyl ether	MMM. Bis(2-Chloroisopropyl)ether	MMMM. Caprolactam	M1. 1,4-Naphthoquinone
N. 2-Nitrophenol	NN. Fluorene	NNN. Aniline	NNNN. 2,6-Dichlorophenol	N1. N-Nitro-o-toluidine
O. 2,4-Dimethylphenol	OO. 4-Nitroaniline	OOO. N-Nitrosodimethylamine	OOOO. 1,2-Diphenylhydrazine	O1. 1,3,5-Trinitrobenzene
P. Bis(2-chloroethoxy)methane	PP. 4,6-Dinitro-2-methylphenol	PPP. Benzoic Acid	PPPP. 3-Methylphenol	P1. Pentachlorobenzene
Q. 2,4-Dichlorophenol	QQ. N-Nitrosodiphenylamine	QQQ. Benzyl alcohol	QQQQ. 3&4-Methylphenol	Q1. 4-Aminobiphenyl
R. 1,2,4-Trichlorobenzene	RR. 4-Bromophenyl-phenylether	RRR. Pyridine	RRRR. 4-Dimethyldibenzothiophene (4MDT)	R1. 2-Naphthylamine
S. Naphthalene	SS. Hexachlorobenzene	SSS. Benzidine	SSSS. 2/3-Dimethyldibenzothiophene (4MDT)	S1. Triphenylene
T. 4-Chloroaniline	TT. Pentachlorophenol	TTT. 1-Methylnaphthalene	TTTT. 1-Methyldibenzothiophene (1MDT)	T1. Octachlorostyrene
U. Hexachlorobutadiene	UU. Phenanthrene	UUU.Benzo(b)thiophene	UUUU.. 2,3,4,6-Tetrachlorophenol	U1. Famphur
V. 4-Chloro-3-methylphenol	VV. Anthracene	VVV.Benzonaphthothiophene	VVVV. 1,2,4,5-Tetrachlorobenzene	V1. 1,4-phenylenediamine
W. 2-Methylnaphthalene	WW. Carbazole	WWW.Benzo(e)pyrene	WWWW.. 2-Picoline	W1. Methapyrilene
X. Hexachlorocyclopentadiene	XX. Di-n-butylphthalate	XXX. 2,6-Dimethylnaphthalene	XXXX. 3-Methylcholanthrene	X1. Pentachloroethane
Y. 2,4,6-Trichlorophenol	YY. Fluoranthene	YYY. 2,3,5-Trimethylnaphthalene	YYYY. a,a-Dimethylphenethylamine	Y1. 3,3'-Dimethylbenzidine
Z. 2,4,5-Trichlorophenol	ZZ. Pyrene	ZZZ. Perylene	ZZZZ. Hexachloropropene	Z1. o-Toluidine

LDC #: 43079C2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer: C

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤20 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤20.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	12/23/17	CCV-SV103	PPP	24.3		All - MB	J/UJ/A (M)
	1045		X	21.7		↓	↓

CONCAL.wpd

LDC #: Y3079C02

VALIDATION FINDINGS WORKSHEET
Field Blanks

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

FB= Field Blank 002

(Y) N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: ug/L **Associated sample units:** ug/kg

Sampling date: 12/14/17

Field blank type: (circle one) Field Blank / Rinsate / Other: _____ Associated Samples: 1 (ND)

Compound	Blank ID	Sample Identification								
	FB									
BBP	0.88									
T	0.86									
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated field blank concentration were qualified as not detected, "U". Other contaminants within five times the field blank concentration were also qualified as not detected, "U".

LDC #: Y3079c2a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
-	2, 3	R	( )	110 (38-107)	( )	#1	J det/A NO
-		E	( )	110 (28-104)	( )		↓
-		BBB	39 (40-140)	( )			J/MS/Δ
+		YY	( )	240 (40-140)	( )		J det/Δ det
-		X	39 (40-140)	( )	( )		J/MS/Δ NO
+		CCC	( )	160 (40-140)	( )		J det/Δ Det
+		III	( )	150 ( )	( )		
+		GGG	( )	170 ( )	( )		
+		DDD	( )	160 ( )	( )		
+		HH	( )	190 ( )	( )		
+		ZZ	( )	220 (35-142)	( )		Det
#-		EEEE	( )	120 (54-104)	( )		NO
-		VVVV	( )	120 (40-117)	( )		
-	p-Chloro-m-cresol		( )	130 (26-103)	( )		
-		HH	0 (4-130)	0 (4-130)	( )		J/R/Δ
-	4,6-Dinitro-o-cresol		( )	0 (10-130)	( )		J/R/Δ
-		TT	( )	16 (17-109)	( )		J/MS/Δ
-		Δ	( )	110 (26-90)	( )		J det/Δ
-		PPP	0 (10-110)	0 (10-110)	( )		J/R/Δ
+		WW	( )	130 (54-128)	( )		J det/Δ Det
			( )	( )	( )		

LDC #: 43079C2a

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

[✓ Y] N N/A Was a LCS required?

Y [✓ N] N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	WG1075347-2/3	BBB	39 (40-140)	( )	( )	All	J/UJ/P all ND
		T	38 (↓)	( )	( )	↓	↓
		T	( )	~~104~~ ( )	104 (50)	↓	↓
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 43079C2a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GCMS SVOA 8270D

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:

Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 20 std)	Recalculated (RRF 20 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	11/28/2017	A	2.081	2.081	1.981	1.981	2.32	2.32
	SV103		JJJJ	2.106	2.106	2.116	2.116	1.64	1.64
			S	1.067	1.067	1.038	1.038	3.49	3.49
			VVVV	0.261	0.261	0.255	0.255	2.21	2.21
			GG	1.321	1.321	1.272	1.272	3.43	3.43
			UU	1.289	1.289	1.245	1.245	3.29	3.29
			DDD	1.273	1.273	1.259	1.259	3.58	3.58
			JJJ	1.161	1.161	1.117	1.117	2.87	2.87

LDC #: 43079C2a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: C

METHOD: GCMS SVOA 8270D

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

RRF = (Ax)(Cis)/(Ais)(Cx)
average RRF = sum of the RRFs/number of standards
%RSD = 100 * (S/X)

Where:

Ax = Area of compound
Cx = Concentration of compound
S = Standard deviation of the RRFs
X = Mean of the RRFs
Ais = Area of associated internal standard
Cis = Concentration of internal Standard

#	Standard ID	Calibration Date	Compound	Reported (RRF 20 std)	Recalculated (RRF 20 std)	Reported AverageRRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
	ICAL	11/28/2017	A	2.081	2.081	1.981	1.981	2.32	2.32
	SV103		JJJJ	2.106	2.106	2.116	2.116	1.64	1.64
			S	1.067	1.067	1.038	1.038	3.49	3.49
			VVVV	0.261	0.261	0.255	0.255	2.21	2.21
			GG	1.321	1.321	1.272	1.272	3.43	3.43
			UU	1.289	1.289	1.245	1.245	3.29	3.29
			DDD	1.273	1.273	1.259	1.259	3.58	3.58
			JJJ	1.161	1.161	1.117	1.117	2.87	2.87

LDC #: 43079 c2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	CCV-8:34 SV103 9:00	12/21/17	Δ (1st IS)	1.981	1.621	1.621	8.0	8.0
			JJJJ (2nd IS)	2.116	2.094	2.094	1.0	1.0
			S (3rd IS)	1.038	0.983	0.983	5.3	5.3
			VVVV (4th IS)	0.265	0.265	0.265	3.9	3.9
			GG (5th IS)	1.272	1.200	1.200	5.7	5.7
			HH (6th IS)	1.245	1.172	1.172	5.9	5.9
2			DDD (1st IS)	1.259	1.198	1.198	4.8	4.8
			JJJ (2nd IS)	1.117	1.090	1.090	2.4	2.4
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079C2a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: a

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)
The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. RRF - RRF)/ave. RRF
$RRF = (A_x)(C_{is})/(A_{is})(C_x)$

Where: ave. RRF = initial calibration average RRF
RRF = continuing calibration RRF
A_x = Area of compound, A_{is} = Area of associated internal standard
C_x = Concentration of compound, C_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Internal Standard)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported %D	Recalculated %D
1	ccv 10:45 11:11 SV103	12/23/17	Δ (1st IS)	1.981	1.839	1.839	7.2	7.2
			JJJ (2nd IS)	2.116	2.121	2.121	0.2	0.2
			S (3rd IS)	1.038	0.978	0.978	5.8	5.8
			VVVV (4th IS)	0.255	0.272	0.272	6.7	6.7
			GG (5th IS)	1.272	1.197	1.197	5.9	5.9
			HH (6th IS)	1.245	1.155	1.155	7.2	7.2
2			DDD (1st IS)	1.259	1.169	1.169	7.1	7.1
			JJJ (2nd IS)	1.117	1.059	1.059	5.2	5.2
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					
3			(1st IS)					
			(2nd IS)					
			(3rd IS)					
			(4th IS)					
			(5th IS)					
			(6th IS)					

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079(2a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer:

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270D)

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5	25.0	22.849	91	91	0
2-Fluorobiphenyl	↓	19.278	77	77	
Terphenyl-d14	↓	13.608	54	54	
Phenol-d5	50.0	39.216	78	78	
2-Fluorophenol	↓	32.226	64	64	
2,4,6-Tribromophenol	↓	29.584	59	59	↓
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

Sample ID: _____

	Surrogate Spiked	Surrogate Found	Percent Recovery Reported	Percent Recovery Recalculated	Percent Difference
Nitrobenzene-d5					
2-Fluorobiphenyl					
Terphenyl-d14					
Phenol-d5					
2-Fluorophenol					
2,4,6-Tribromophenol					
2-Chlorophenol-d4					
1,2-Dichlorobenzene-d4					

LDC #: 43079C2a

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SSC - SC)/SA Where: SSC = Spiked sample concentration; SA = Spike added; SC = Sample concentation

RPD = I MSC - MSC I * 2/(MSC + MSDC) MSC = Matrix spike concentration MSDC = Matrix spike duplicate concentration

MS/MSD samples: 2 & 3

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	------	MS	MSD	Reported	Recalc	Reported	Recalc	Reported	Recalc
Phenol	1510	1490	NM	1300 (1291.16)	1600 (1575.08)	86	85.5	110	105.7	21	20
N-Nitroso-di-n-propylamine				1400	1700	93	92.7	110	114	19	19
4-Chloro-3-methylphenol				1500	1900	100	99.3	130	127.5	24	24
Acenaphthene			62 (62.44)	1300 (1332)	1800 (1820.78)	86	84	120	118	32	31
Pentachlorophenol			NM	300	240	20	19.9	16	16	22	22
Pyrene			400	3200	4700	120	119	220	221	38	38

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079c2a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

The percent recoveries (%R) and Relative Percent Difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100 * (SC/SA Where: SSC = Spike concentration
SA = Spike added

RPD = I LCSC - LCSDC I * 2/(LCSC + LCSDC) LCSC = Laboratory control sample concentration LCSDC = Laboratory control sample duplicate concentration

LCS/LCSD samples: WG1075347-2/3

Compound	Spike Added (ug/L)		Spike Concentration (ug/L)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc	Reported	Recalc	Reported	Recalculated
Phenol	1300	1300	946.85 95 0	1040.34 1000	72	72	80	80	11	5
N-Nitroso-di-n-propylamine	↓	↓	960	1100	73	73	83	83	13	14
4-Chloro-3-methylphenol	↓	↓	1100	1200	84	84	96	96	13	9
Acenaphthene	1300	1300	990	1100	75	75	86	86	14	11
Pentachlorophenol	↓	↓	1000	1100	76	76	82	82	8	10
Pyrene	↓	↓	1000	1100	78	78	86	86	10	10
									↓	
									Base on	Base on
									%R	Conc.

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079 C2a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer: FT
2nd reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270D)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1 , GG

Conc. = $\frac{87537\ (40.0)\ (1.0)\ (1000)}{168252\ (1.272)\ (30.29)\ (0.865}$

=

62.44 ug/kg

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Qualification
	#1	GG	62	62.44	

LDC #: 43079C3a
SDG #: L1746315
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Category B

Date: 9/19/18
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW846 Method 8081B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	GC Instrument Performance Check	A	
III.	Initial calibration/ICV	A / A	%RSD ≤20, r² ICV ≤20
IV.	Continuing calibration	SW	CCV ≤20
V.	Laboratory Blanks	A	
VI.	Field blanks	ND	FB= Field Blank 002
VII.	Surrogate spikes 1/4	SW/A	
VIII.	Matrix spike/Matrix spike duplicates	A	
IX.	Laboratory control samples	A	LCS ID
X.	Field duplicates	N	
XI.	Compound quantitation/RL/LOQ/LODs	SW	Results < RL > MDL = Jdt
XII.	Target compound identification	A	
XIII.	System Performance	A	
XIV.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB006 (0-2)	L1746315-03	Soil	12/14/17
2	SB006 (0-2)MS	L1746315-03MS	Soil	12/14/17
3	SB006 (0-2)MSD	L1746315-03MSD	Soil	12/14/17
4				
5				
6				
7				
8				
9				
10				

Notes:

	WG1075287-1						

LDC #: 43079C3a

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: EJ
2nd Reviewer:

Method: Pesticides (EPA SW 846 Method 8081)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
II. GC/ECD Instrument performance check				
Was the instrument performance found to be acceptable?	✓			
Were Evaluation mix standards analyzed prior to the initial calibration and at beginning of each 12-hour shift?	✓			
Were endrin and 4,4'-DDT breakdowns ≤ 15% for individual breakdown in the Evaluation mix standards?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?	✓			
Were the RT windows properly established?	✓			
IIIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?	✓			
IV. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20% or percent recoveries (%R) 80-120%?		✓		
Were all the retention times within the acceptance windows?	✓			
V. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
VI. Field blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes/Internal Standards				
Were all surrogate percent recovery (%R) within the QC limits?		✓		

LDC #: 43079C30

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2
Reviewer: FT
2nd Reviewer: C

Validation Area	Yes	No	NA	Findings/Comments
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?		✓		
If any percent recovery (%R) was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
Were internal standard area counts within ± 50% of the average area calculated during calibration?	✓	✓		
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.	✓			
Was a MS/MSD analyzed every 20 samples of each matrix?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
XI. Compound quantitation				
Were compound quantitation and RLs adjusted to reflect all sample dilutions, dry weight factors, and clean-up activities applicable to level IV validation?	✓			
Were relative percent difference (RPD) of the results between two columns ≤ 40%?		✓		
XII. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPA SW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Arochlor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 43079C3a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___%R
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / %R validation criteria of ≤20.0% / 80-120%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D (Limit ≤ 20.0)	RT (limit)	Associated Samples	Qualifications
	12/22/17	CCV- Pest 11	CLP1	C	25.5		WG1075287-1	J/UJ/A ND
	12/16			N	21.3		↓	↓
			CLP2	C	22.8			
				N	21.9			

LDC #: 43079 C3a

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: FT
2nd Reviewer: Q

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Associated Samples	Compound Name	% RPD Bet 2 col ≤ 40 Findings	Qualifications
	1	C	104	Jdw/A
		Trans-Chlordane	130	↓
		↓	50	↓

Comments: See sample calculation verification worksheet for recalculations

LDC #: 43079c3a

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer: Q

METHOD: GC __X_____ HPLC _____

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported 4.0	Recalculated 4.0	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	12/6/2017	Gamma BHC CLP1	1.309	1.309	1.331	1.331	10.68	1.331
	PEST 10		Delta BHC CLP1	1.228	1.228	1.257	1.257	11.09	1.257
			Gamma BHC CLP2	1.285	1.285	1.303	1.303	7.83	1.303
			Delta BHC CLP2	1.203	1.203	1.271	1.271	12.55	1.271

LDC #: 43079 c3a

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Reviewer: FT
2nd Reviewer: C

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV-1038 Pest 10	12/26/18	gamma BHC	50.0	46.332	46.332	7.3	7.3
			Delta-BHC		48.167	48.167	3.7	3.7
					48.079	48.079	3.8	3.8
					50.162	50.162	0.3	0.3
2	CCV 1216 Pest 11	12/22/18			55.225	55.225	10.5	10.5
					62.760	62.760	25.5	25.5
					53.921	53.921	7.8	7.8
					61.413	61.413	22.8	22.8
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079C3a

VALIDATION FINDINDS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: ✓ **GC** __ **HPLC**

Are surrogates required by the method? Yes____ or No____.

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were surrogates spiked into all samples and blanks?

Y N N/A Did all surrogate recoveries (%R) meet the QC limits?

#	Sample ID	Detector/ Column	Surrogate Compound	%R (Limits)	Qualifications
	1	CLP1	o	173 (30-150)	Jdet 1A ND + Det
		CLP2	↓	174 (↓)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C`	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 43079C3a

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Page: 1 of 1
Reviewer: FT
2nd reviewer: C

METHOD: V GC __ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TCMX	CLP1	50.0	61.398	123	123	0
↓	CLP2	↓	66.513	133	133	↓
DCB	↓	↓	86.534	173	173	
↓	↓	↓	87.135	174	174	↓

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 43079c3a

VALIDATION FINDINGS WORKSHEET

Matrix Spike/Matrix Spike Duplicates Results Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC Pesticides (EPA SW 846 Method 8081)

The percent recoveries (%R) and Relative Percent difference (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I MS - MSD I * 2/(MS + MSD)

MS = Matrix spike percent recovery

MSD = Matrix spike duplicate percent recovery

MS/MSD samples: 2 & 3

Compound	Spike Added (ug/kg)		Sample Concentration (ug/kg)	Spiked Sample Concentration (ug/kg)		Matrix Spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD		MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	37	37.6	ND	34.8	37.4	94	94	100	100	7	7
4,4'-DDT	↓	↓	ND	39.2	44.1	106	106	117	117	12	12

Comments: Refer ot Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079C3a

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicate Results Verification

Page: 1 of 1
Reviewer: PJ
2nd Reviewer: [illegible]

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

The percent recoveries (%R) and Relative Percent difference (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

% Recovery = 100* (SSC-SC)/SA

Where: SSC = Spiked sample concentration
SA = Spike added
SC = Concentration

RPD = I LCS - LCSD I * 2/(LCS + LCSD)

LCS = Laboratory control sample percent recovery

LCSD = Laboratory control sample duplicate percent recovery

LCS/LCSD samples: WG1075281-2/3

Compound	Spike Added (ug/kg)		Spiked Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
gamma-BHC	32.1	31.8	31.4	36.3	98	98	114	114	15	14
4,4'-DDT	↓	↓	37.1	43.3	116	116	136	136	16	15
									Based on %R	Based on Conc

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079 C3a

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Reviewer:
2nd reviewer:

METHOD: GC Pesticides (EPA SW 846 Method 8081A)

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

Concentration = $\frac{(A_x)(I_s)(V_t)(DF)(2.0)}{(A_{is})(RRF)(V_o)(V_i)(\%S)}$

A_x	=	Area of the characteristic ion (EICP) for the compound to be measured
A_{is}	=	Area of the characteristic ion (EICP) for the specific internal standard
I_s	=	Amount of internal standard added in nanograms (ng)
V_o	=	Volume or weight of sample extract in milliliters (ml) or grams (g).
V_i	=	Volume of extract injected in microliters (ul)
V_t	=	Volume of the concentrated extract in microliters (ul)
Df	=	Dilution Factor.
%S	=	Percent solids, applicable to soil and solid matrices only.
2.0	=	Factor of 2 to account for GPC cleanup

Example:

Sample I.D. #1 , 4,4'-DDD

Conc. = $\frac{13699465\ (25)\ (10)}{31301771\ (0.942)\ (15.35)\ (0.865)}$

= 8.747 ug/kg

#	Sample ID	Compound	Reported Concentration (ug/kg)	Calculated Concentration (ug/kg)	Qualification
	#1	4,4'-DDD	~~8.747~~ 8.75	8.747	

LDC #: 43079C3b

SDG #: L1746315

Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET

Category B

Date: 9/19/18

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW846 Method 8082A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / A	
II.	Initial calibration/ICV	A A	%D RSD / ICV ≤ 20
III.	Continuing calibration	A	CCV ≤ 20
IV.	Laboratory Blanks	A	
V.	Field blanks	SW	FB = Field Blank 002
VI.	Surrogate spikes /13 F1	SW A / A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS ID
IX.	Field duplicates	N	
X.	Compound quantitation/RL/LOQ/LODs	SW	Result < RL > MDL = Jut
XI.	Target compound identification	A	
XII.	Overall assessment of data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB006 (0-2)	L1746315-03	Soil	12/14/17
2	SB006 (0-2)MS	L1746315-03MS	Soil	12/14/17
3	SB006 (0-2)MSD	L1746315-03MSD	Soil	12/14/17
4				
5				
6				
7				
8				
9				
10				
11				
12				

Notes:

WG1075307-1 Blank

LDC #: 43079c3b

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2
Reviewer: FT
2nd Reviewer: CF

Method: ✓ GC ___ HPLC

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was cooler temperature criteria met?	✓			
IIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) ≤ 20%?	✓			
Was a curve fit used for evaluation? If yes, did the initial calibration meet the curve fit acceptance criteria of ≥ 0.990?			✓	
Were the RT windows properly established?	✓			
IIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after each initial calibration for each instrument?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
III. Continuing calibration				
Was a continuing calibration analyzed daily?	✓			
Were all percent differences (%D) ≤ 20%?	✓			
Were all the retention times within the acceptance windows?	✓			
IV. Laboratory Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation findings worksheet.		✓		
V. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?	✓			
VI. Surrogate spikes				
Were all surrogate percent recovery (%R) within the QC limits?	✓			
If the percent recovery (%R) of one or more surrogates was outside QC limits, was a reanalysis performed to confirm %R?			✓	
If any %R was less than 10 percent, was a reanalysis performed to confirm %R?			✓	
VII. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?	✓			
VIII. Laboratory control samples				
Was an LCS analyzed for this SDG?	✓			

LDC #: 43079c3b

VALIDATION FINDINGS CHECKLIST

Reviewer: [illegible]
2nd Reviewer: [illegible]

Validation Area	Yes	No	NA	Findings/Comments
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	✓			
IX. Field duplicates				
Were field duplicate pairs identified in this SDG?		✓		
Were target compounds detected in the field duplicates?			✓	
X. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	✓			
Were compound quantitation and RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Target compound identification				
Were the retention times of reported detects within the RT windows?	✓			
XIII. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. Chlordane
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. Chlordane (Technical)
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Aroclor 1262
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Aroclor 1268
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. 2,4'-DDD	KK. Oxychlordane
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. 2,4'-DDE	LL. trans-Nonachlor
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. 2,4'-DDT	MM. cis-Nonachlor
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. Hexachlorobenzene	NN.

Notes:_____

LDC #: 43079 c3b

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: FT
2nd Reviewer:

FB = FIELD BLANK 002

METHOD: / **GC** __ **HPLC**

Y N N/A Were field blanks identified in this SDG?

Y N N/A Were target compounds detected in the field blanks?

Blank units: ng/L **Associated sample units:** ng/kg

Sampling date: 12/14/17

Field blank type: (circle one) Field Blank / Trip Blank / Atmospheric Blank / Ambient Blank Associated Samples: 1

Rinsate / Equipment Rinsate / Equipment Blank / Source Blank / Other: FB

Compound	Blank ID	Blank ID	Sample Identification							
	FB		1							
BB	0.039		21.3 / 36.6 U							
PCB Total	0.039		85.4J							
CRQL										

Blank units: _____ **Associated sample units:** _____

Sampling date: _____

Field blank type: (circle one) Field Blank / Trip Blank/ Atmospheric Blank/ Ambient Blank Associated Samples: _____

Rinsate / Equipment Rinsate / Equipment Blank / Source Blank / Other: _____

Compound	Blank ID	Blank ID	Sample Identification							
CRQL										

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Samples with compound concentrations within five times the associated field blank concentration are listed above, these sample results were qualified as not detected, "U".

LDC #: 43079c3b

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: FT
2nd Reviewer: [illegible]

METHOD: ✓ **GC** __ **HPLC**

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Associated Samples	Compound Name	%RPD Bet 2 col ≤ 40 Findings	Qualifications
	1	AA	107	J det / A

Comments: See sample calculation verification worksheet for recalculations

LDC #: 43079C36

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Reviewer: FT
2nd Reviewer:

METHOD: GC __X_____ HPLC _____

The calibration factors (CF), average CF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

CF = A/C
average CF = sum of the CF/number of standards
%RSD = 100 * (S/X)

Where:
A = Area of compound
C = Concentration of compound
S = Standard deviation of calibration factors
X = Mean of calibration factors

#	Standard ID	Calibration Date	Compound	Reported 1000ppb	Recalculated 1000ppb	Reported Average CF (Initial)	Recalculated Average CF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL	8/30/2017	AR1260-1 CLP 1	0.049	0.049	0.050	0.050	11.46	11.46
	PEST 13								
			AR1260-1 CLP 2	0.043	0.043	0.046	0.046	16.8	16.8

LDC #: 43079 c3b

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: GC ✓ HPLC _____

The percent difference (%D) of the initial calibration average Calibration Factors (CF) and the continuing calibration CF were recalculated for the compounds identified below using the following calculation:

% Difference = 100 * (ave. CF -CF)/ave.CF

Where: ave. CF = initial calibration average CF
CF = continuing calibration CF
A = Area of compound
C = Concentration of compound

#	Standard ID	Calibration Date	Compound	Average CF(ICAL)/ CCV Conc.	Reported CF/ Conc. CCV	Recalculated CF/ Conc. CCV	Reported %D	Recalculated %D
1	CCV-PEST 13 0809AM	12/22/12	Aroclo 1260-1 clp1	2500.0	2720.643	2720.643	8.8	8.8
			clp2	↓	2423.412	2423.412	3.1	3.1
2	CCV-PEST 2 ~~10~~ 10 0959AM	12/~~22~~ 21/17	↓	2500.0	2275.032	2275.032	9.0	9.0
			↓	2500.0	2181.968	2181.968	12.7	12.7
3								
4								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079c3b

VALIDATION FINDINGS WORKSHEET
Surrogate Results Verification

Reviewer: FT
2nd reviewer:

METHOD: ✓ GC ___ HPLC

The percent recoveries (%R) of surrogates were recalculated for the compounds identified below using the following calculation:

% Recovery: SF/SS * 100

Where: SF = Surrogate Found
SS = Surrogate Spiked

Sample ID: #1

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	
TCMX	CLP1	500.0	418.097	84	84	0
↓	CLP2	↓	358.172	72	72	↓
DCB	CLP1	↓	318.979	64	64	↓
↓	CLP2	↓	382.396	76	76	↓

Sample ID: _____

Surrogate	Column/Detector	Surrogate Spiked	Surrogate Found	Percent Recovery	Percent Recovery	Percent Difference
				Reported	Recalculated	

	Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound		Surrogate Compound
A	Chlorobenzene (CBZ)	G	Octacosane	M	Benzo(e)Pyrene	S	1-Chloro-3-Nitrobenzene	Y	Tetrachloro-m- xylene
B	4-Bromofluorobenzene (BFB)	H	Ortho-Terphenyl	N	Terphenyl-D14	T	3,4-Dinitrotoluene	Z	2-Bromonaphthalene
C	a,a,a-Trifluorotoluene	I	Fluorobenzene (FBZ)	O	Decachlorobiphenyl (DCB)	U	Tripentyltin	AA	Chloro-octadecane
D	Bromochlorobenene	J	n-Triacontane	P	1-methylnaphthalene	V	Tri-n-propyltin	BB	2,4-Dichlorophenylacetic acid
E	1,4-Dichlorobutane	K	Hexacosane	Q	Dichlorophenyl Acetic Acid (DCAA)	W	Tributyl Phosphate	CC	2,5-Dibromotoluene
F	1,4-Difluorobenzene (DFB)	L	Bromobenzene	R	4-Nitrophenol	X	Triphenyl Phosphate		

LDC #: 43079c3b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: a

METHOD: ✓ GC __HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the matrix spike and matrix spike duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC - SC)/SA

RPD =(({SSCMS - SSCMSD} * 2) / (SSCMS + SSCMSD))*100

Where SSC = Spiked sample concentration; SC = Sample concentration; SA = Spike added; MS = Matrix spike; MSD = Matrix spike duplicate

MS/MSD samples: 2 + 3

Compound	Spike Added (ug/Kg)		Sample Conc. (ug/Kg)	Spike Sample Concentration (ug/Kg)		Matrix spike Percent Recovery		Matrix Spike Duplicate Percent Recovery		MS/MSD RPD	
	MS	MSD	---	MS	MSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)											
Diesel (8015)											
Benzene (8021B)											
Methane (RSK-175)											
2,4-D (8151)											
Dinoseb (8151)											
Naphthalene (8310)											
Anthracene (8310)											
HMX (8330)											
2,4,6-Trinitrotoluene (8330)											
Phorate (8141A)											
Malathion (8141A)											
Formaldehyde (8315A)											
Aroclor 1260	231	239	21.3	175	178	76	67	75	65	2	1.22
				175.497	177.8						

Comments: Refer to Matrix Spike/Matrix Spike Duplicates findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079C3b

VALIDATION FINDINGS WORKSHEET

Laboratory Control Sample/Laboratory Control Sample Duplicates Results Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: ✓ GC ___HPLC

The percent recoveries (%R) and relative percent differences (RPD) of the laboratory control sample and laboratory control sample duplicate were recalculated for the compounds identified below using the following calculation:

%Recovery = 100 * (SSC/SA)
RPD =(({SSCLCS - SSCLCSD} * 2) / (SSCLCS + SSCLCSD))*100

Where SSC = Spiked sample concentration
LCS = Laboratory Control Sample
SA = Spike added
LCSD = Laboratory Control Sample duplicate

LCS/LCSD samples: WG1075307-2/3 LCS ID

Compound	Spike Added (ug/kg)		Spike Sample Concentration (ug/kg)		LCS Percent Recovery		LCSD Percent Recovery		LCS/LCSD RPD	
	LCS	LCSD	LCS	LCSD	Reported	Recalc.	Reported	Recalc.	Reported	Recalc.
Gasoline (8015)										
Diesel (8015)										
Benzene (8021B)										
Methane (RSK-175)										
2,4-D (8151)										
Dinoseb (8151)										
Naphthalene (8310)										
Anthracene (8310)										
HMX (8330)										
2,4,6-Trinitrotoluene (8330)										
Phorate (8141A)										
Malathion (8141A)										
Formaldehyde (8315A)										
Aroclor 1260	203	202	201	177	99	99	88	88	12 (Based on %R)	13 (Based on Cnc)
			201.27	176.72						

Comments: Refer to Laboratory Control Sample/Laboratory Control Sample Duplicate findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #: 43079C36

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: FT
2nd Reviewer: C

METHOD: V GC __ HPLC

Y N N/A Were all reported results recalculated and verified for all level IV samples?
Y N N/A Were all recalculated results for detected target compounds within 10% of the reported results?

Concentration= (A)(Fv)(Df) / (RF)(Vs or Ws)(%S/100)

A= Area or height of the compound to be measured
Fv= Final Volume of extract
Df= Dilution Factor
RF= Average response factor of the compound In the initial calibration
Vs= Initial volume of the sample
Ws= Initial weight of the sample
%S= Percent Solid

Example:

Sample ID. #1 Compound Name Aroclor 1260

Concentration = $\frac{291.29\ (5)\ (1)}{(15.8)(5)(0.865)}$ → 0.865

= 21.3 ug/kg

#	Sample ID	Compound	Reported Concentrations (ug/kg)	Recalculated Results Concentrations (ug/kg)	Qualifications
	#1	Aroclor 1260	21.3	21.3	
	PCB-2 = $\frac{27593519\ (250)}{595.9 \times 10^6 (0.0533)}$ = 217.19		1260-2 = 217.19 -3 = 359.328 -4 = 297.362 Ave = 291.29		

Comments:

Site: Williamsbridge Gardens
Laboratory: Alpha Analytical, Inc.
Report No.: L1746315
Reviewer: An Le and Christina Rink/Laboratory Data Consultants for P.W. Grosser Consulting
Date: September 20, 2018

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
SB006 (0-2)	L1746315-03	Metals
SB006 (0-2)MS	L1746315-03MS	Metals
SB006 (0-2)MSD	L1746315-03MSD	Metals

Associated QC Samples(s):
Field/Trip Blanks: Field Blank 002
Field Duplicate pair: None Associated

The above-listed soil samples were collected on December 14, 2017 and were analyzed for metals by SW-846 methods 6010C/7471B. The data validation was performed in accordance with the USEPA Region 2 *Standard Operating Procedure for the Evaluation of Metals for the Contract Laboratory Program,* SOP HW-2a/c, Revision 15 (December 2012) and the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review,* EPA 540-R-2017-001 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The inorganic data were evaluated based on the following parameters:

- Overall Evaluation of Data and Potential Usability Issues
- Data Completeness
- Holding Times and Sample Preservation
- Instrument Calibration
- Contract Required Quantitation Limit (CRQL) Standard Recoveries
- Blank Analysis Results
- Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Results
- Matrix Spike (MS) Results
- Laboratory Duplicate Results
- Field Duplicate Results
- Laboratory Control Sample (LCS) Results
- Serial Dilution Results
- Moisture Content
- Detection Limits Results
- Sample Quantitation Results

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times and Sample Preservation

All criteria were met.

Instrument Calibration

All criteria were met.

CRQL Standard Recoveries

Analytes that did not meet criteria are summarized in the following table.

Date	Calibration ID	Analyte	%R (Limits)	Associated Samples	Validation Action
12/22/17	CRI (08:48)	Sodium	13 (70-130)	SB006 (0-2)	J detects

The sodium results may be biased low due to low CRQL percent recovery. The result can be used for project objectives as an estimated value (J) which may have a minor impact on the data usability.

Although the aluminum, barium, calcium, copper, iron, magnesium, and zinc CRQL standards were outside validation limits, no action was taken since the affected sample is greater than two times the reporting limit (RL).

Blank Results

Contamination was not detected in the laboratory blank samples.

No positive results were found in the field blank sample Field Blank 002 for metals analyses.

ICP ICS Results

Analytes were within control limits in the ICSA and ISCAB analyses.

MS/MSD Results

MS/MSD analyses were performed on sample SB006 (0-2) for metals analyses. The following table lists the analytes which exhibited recoveries outside of the control limits in the MS/MSD and the resulting validation actions.

Analyte	MS %R (Limits)	MSD %R (Limits)	RPD Limits	Associated Samples	Validation Actions
Arsenic	-	74 (75-125)	-	SB006 (0-2)	J detects/UJ nondetects
Barium	-	65 (75-125)	-		J detects/UJ nondetects
Chromium	-	34 (75-125)	-		J detects/UJ nondetects
Cobalt	-	73 (75-125)	-		J detects/UJ nondetects
Copper	49 (75-125)	221 (75-125)	-		J detects/UJ nondetects
Nickel	-	72 (75-125)	-		J detects/UJ nondetects
Thallium	72 (75-125)	-	-		J detects/UJ nondetects
Vanadium	-	62 (75-125)	-		J detects/UJ nondetects
Calcium	274 (75-125)	207 (75-125)	-	SB006 (0-2)	J detects
Mercury	159 (75-125)	-	-		J detects
Magnesium	-	14 (75-125)	-	SB006 (0-2)	J detects
Aluminum	-	-	36 (≤20)	SB006 (0-2)	J detects
Chromium	-	-	23 (≤20)		J detects
Copper	-	-	34 (≤20)		J detects
Iron	-	-	30 (≤20)		J detects
Lead	-	-	75 (≤20)		J detects
Magnesium	-	-	24 (≤20)		J detects
Zinc	-	-	35 (≤20)		J detects

- Within control limits

The arsenic, barium, chromium, cobalt, nickel, thallium, vanadium, and magnesium results may be biased low due to low MS/MSD percent recoveries. The results can be used for project objectives as estimated values (J) or nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

The calcium and mercury results may be biased high due to high MS/MSD percent recoveries. The results can be used for project objectives as estimated values (J) which may have a minor impact on the data usability.

The copper results were estimated due to high and low MS/MSD percent recoveries. The bias cannot be determined. The results can be used for project objectives as estimated values (J) which may have a minor impact on the data usability.

The aluminum, chromium, copper, iron, lead, magnesium, and zinc results were estimated due to MS/MSD relative percent difference exceedances. The bias cannot be determined. The results can be used for project objectives as estimated values (J) which may have a minor impact on the data usability.

Laboratory Duplicate Results

Laboratory duplicates were not associated with this sample set. Validation action was not required on this basis.

Field Duplicate Results

A field duplicate pair was not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Serial Dilution Results

A serial dilution analysis was performed on sample SB006 (0-2) for metals analyses. All criteria were met.

Moisture Content

All criteria were met.

Detection Limits Results

Results were reported which were below the reporting limit (RL) and above the method detection limit (MDL) in the metals analyses. These results were estimated (J) by the laboratory.

Due to high target analyte levels or sample matrix, select samples were analyzed at dilutions. The following table lists the sample dilutions which were performed and the results reported. RLs were elevated accordingly.

Sample	Metals analyses Reported
SB006 (0-2)	2-fold dilution due to high target analyte levels

Sample Quantitation Results

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

Form 1
METALS

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/22/17 18:17
Sample Matrix	: SOIL	Dilution Factor	: 2
Analytical Method	: 1,6010C	Analyst	: AB
Lab File ID	: WG1075746.pdf	Instrument ID	: TRACE6
Sample Amount	: 1.331g	%Solids	: 87
Digestion Method	: EPA 3050B	Date Digested	: 12/21/17

		mg/kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
7429-90-5	Aluminum, Total	10800	8.68	2.34	
7440-36-0	Antimony, Total	2.29	4.34	0.330	J
7440-38-2	Arsenic, Total	5.22	0.868	0.181	
7440-39-3	Barium, Total	225	0.868	0.151	
7440-41-7	Beryllium, Total	0.486	0.434	0.029	
7440-43-9	Cadmium, Total	0.799	0.868	0.085	J
7440-70-2	Calcium, Total	2790	8.68	3.04	
7440-47-3	Chromium, Total	24.9	0.868	0.083	
7440-48-4	Cobalt, Total	8.17	1.74	0.144	
7440-50-8	Copper, Total	84.5	0.868	0.224	
7439-89-6	Iron, Total	20800	4.34	0.784	
7439-92-1	Lead, Total	420	4.34	0.233	
7439-95-4	Magnesium, Total	2910	8.68	1.34	
7439-96-5	Manganese, Total	681	0.868	0.138	
7440-02-0	Nickel, Total	15.0	2.17	0.210	
7440-09-7	Potassium, Total	1050	217	12.5	
7782-49-2	Selenium, Total	1.02	1.74	0.224	J
7440-22-4	Silver, Total	ND	0.868	0.246	U
7440-23-5	Sodium, Total	38.1	174	2.74	J
7440-28-0	Thallium, Total	ND	1.74	0.274	U
7440-62-2	Vanadium, Total	32.5	0.868	0.176	
7440-66-6	Zinc, Total	378	4.34	0.254	

SEP 21 2018

Initials: CR

Form 1
METALS

Client	: P. W. Grosser	Lab Number	: L1746315
Project Name	: BBU1702	Project Number	: BBU1702
Lab ID	: L1746315-03	Date Collected	: 12/14/17 09:45
Client ID	: SB006 (0-2)	Date Received	: 12/14/17
Sample Location	: 718 E. 212TH STREET, BRONX, NY	Date Analyzed	: 12/21/17 18:55
Sample Matrix	: SOIL	Dilution Factor	: 1
Analytical Method	: 1,7471B	Analyst	: EA
Lab File ID	: WG1075587	Instrument ID	: FIMS4
Sample Amount	: 0.395g	%Solids	: 87
Digestion Method	: EPA 7471B	Date Digested	: 12/21/17

		mg/kg			
CAS NO.	Parameter	Results	RL	MDL	Qualifier
7439-97-6	Mercury, Total	0.45	0.07	0.02	J

SEP 21 2018

Initials: CR

LDC #: 43079C4b
SDG #: L1746315
Laboratory: Alpha Analytical, Inc.

VALIDATION COMPLETENESS WORKSHEET
Category B

Date: 9/20/18
Page: 1 of 1
Reviewer: ATV
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010C/7471B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A /A	
II.	Instrument Calibration	SW	
III.	ICP Interference Check Sample (ICS) Analysis	A	
IV.	Laboratory Blanks	A	
V.	Field Blanks	ND	FIELD BLANK002 (From SDG # L1746315)
VI.	Matrix Spike/Matrix Spike Duplicates	SW	(2,3)
VII.	Duplicate sample analysis	N	
VIII.	Serial Dilution	A	
IX.	Laboratory control samples	A	LCS
X.	Field Duplicates	N	
XI.	Sample Result Verification	A	MDL < sample < RL : Jdt
XII.	Overall Assessment of Data	A	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank; SB=Source blank; OTHER:

	Client ID	Lab ID	Matrix	Date
1	SB006 (0-2) (2X due to high analytes)	L1746315-03	Soil	12/14/17
2	SB006 (0-2)MS	L1746315-03MS	Soil	12/14/17
3	SB006 (0-2)MSD	L1746315-03MSD	Soil	12/14/17
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

Notes:

DC #: 43079C4b

VALIDATION FINDINGS CHECKLIST

Reviewer: ATL
2nd Reviewer:

Method: Metals (EPA SW 846 Method 6010/6020/7000)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
All technical holding times were met.	✓			
Cooler temperature criteria was met.	✓			
II. ICP/MS Tune				
Were all isotopes in the tuning solution mass resolution within 0.1 amu?			✓	
Were %RSD of isotopes in the tuning solution ≤5%?			✓	
III. Calibration				
Were all instruments calibrated daily, each set-up time?	✓			
Were the proper number of standards used?	✓			
Were all initial and continuing calibration verification %Rs within the 90-110% (80-120% for mercury) QC limits?		✓		
Were the low standard checks within 70-130%		✓		
Were all initial calibration correlation coefficients within limits as specified by the method?	✓			
IV. Blanks				
Was a method blank associated with every sample in this SDG?	✓			
Was there contamination in the method blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
V. ICP Interference Check Sample				
Were ICP interference check samples performed daily?	✓			
Were the AB solution percent recoveries (%R) with the 80-120% QC limits?	✓			
VI. Matrix spike/Matrix spike duplicates				
Were a matrix spike (MS) and duplicate (DUP) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD or MS/DUP. Soil / Water.	✓			
Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the 75-125 QC limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.		✓		
Were the MS/MSD or duplicate relative percent differences (RPD) ≤ 20% for waters and ≤ 35% for soil samples? A control limit of +/- RL(+/-2X RL for soil) was used for samples that were ≤ 5X the RL, including when only one of the duplicate sample values were ≤ 5X the RL.		✓		
VII. Laboratory control samples				
Was an LCS anaylzed for this SDG?	✓			
Was an LCS analyzed per extraction batch?	✓			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the 80-120% QC limits for water samples and laboratory established QC limits for soils?	✓			

Validation Area	Yes	No	NA	Findings/Comments
VIII. Internal Standards (EPA SW 846 Method 6020/EPA 200.8)				
Were all the percent recoveries (%R) within the 30-120% (6020)/60-125% (200.8) of the intensity of the internal standard in the associated initial calibration?			✓	
If the %Rs were outside the criteria, was a reanalysis performed?			✓	
IX. ICP Serial Dilution				
Was an ICP serial dilution analyzed if analyte concentrations were > 50X the MDL (ICP)/>100X the MDL(ICP/MS)?	✓			
Were all percent differences (%Ds) < 10%?	✓			
Was there evidence of negative interference? If yes, professional judgement will be used to qualify the data.		✓		
X. Sample Result Verification				
Were RLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?	✓			
XI. Overall assessment of data				
Overall assessment of data was found to be acceptable.	✓			
XII. Field duplicates				
Field duplicate pairs were identified in this SDG.		✓		
Target analytes were detected in the field duplicates.			✓	
XIII. Field blanks				
Field blanks were identified in this SDG.	✓			
Target analytes were detected in the field blanks.		✓		

C #: 43079C4b

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: ATL
2nd reviewer:

l circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1	S	[✓ Al], [✓ Sb], [✓ As], [✓ Ba], [✓ Be], [✓ Cd], [✓ Ca], [✓ Cr], [✓ Co], [✓ Cu], [✓ Fe], [✓ Pb], [✓ Mg], [✓ Mn], [✓ Hg], [✓ Ni], [✓ K], [✓ Se], [✓ Ag], [✓ Na], [✓ Tl], [✓ V], [✓ Zn], [✓ ~~Mo~~], B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
QC		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
2,3	S	[✓ Al], [✓ Sb], [✓ As], [✓ Ba], [✓ Be], [✓ Cd], [✓ Ca], [✓ Cr], [✓ Co], [✓ Cu], [✓ Fe], [✓ Pb], [✓ Mg], [✓ Mn], [✓ Hg], [✓ Ni], [✓ K], [✓ Se], [✓ Ag], [✓ Na], [✓ Tl], [✓ V], [✓ Zn], Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Analysis Method

ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Sn, Ti, ____

Comments: Mercury by CVAA if performed

LDC #: 43079C4b

VALIDATION FINDINGS WORKSHEET
Calibration

Reviewer: ATL
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all instruments calibrated daily, each set-up time, and were the proper number of standards used?

Y (N) N/A Were all initial and continuing calibration verification percent recoveries (%R) within the control limits of 90-110% for all analytes except mercury (80-120%) and cyanide (85-115%)? 70-130%

LEVEL IV ONLY:

Y N (N/A) Was a midrange cyanide standard distilled?

(Y) N N/A Are all correlation coefficients ≥0.995?

(Y) N N/A Were recalculated results acceptable? See Level IV Initial and Continuing Calibration Recalculation Worksheet for recalculations.

#	Date	Calibration ID	Analyte	%R	Associated Samples	Qualification of Data
	12/22/17	ICV (08:10)	Ca	144 (90-110)	1	no qual, ICV @ 12:20 all analytes passed
	12/22/17	CRI (08:48)	Al	137 (70-130)	1	no qual, sample > 2X RL
	12/22/17	CRI (08:48)	Ba	138 (70-130)	1	no qual, sample > 2X RL
	12/22/17	CRI (08:48)	Ca	209 (70-130)	1	no qual, sample > 2X RL
	12/22/17	CRI (08:48)	Cu	132 (70-130)	1	no qual, sample > 2X RL
	12/22/17	CRI (08:48)	Fe	271 (70-130)	1	no qual, sample > 2X RL
	12/22/17	CRI (08:48)	Mg	132 (70-130)	1	no qual, sample > 2X RL
	12/22/17	CRI (08:48)	Na	13 (70-130)	1	J/UJ/P (detect)
	12/22/17	CRI (08:48)	Zn	172 (70-130)	1	no qual, sample > 2X RL

Comments:

LDC #: 43079C4b

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: ATL
2nd Reviewer:

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125~~ lab limits? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for samples?

LEVEL IV ONLY:

(Y) N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	2/3	S	As		74 (75-125)		all	J/UJ/A (detect)
		S	Ba		65 (75-125)		all	J/UJ/A (detect)
		S	Ca	274 (75-125)	207 (75-125)		all	Jdet/A (detect)
		S	Cr		34 (75-125)		all	J/UJ/A (detect)
		S	Co		73 (75-125)		all	J/UJ/A (detect)
		S	Cu	49 (75-125)	221 (75-125)		all	J/UJ/A (detect)
		S	Mg		14 (75-125)		all	J/R/A (detect) PS=68%
		S	Ni		72 (75-125)		all	J/UJ/A (detect)
		S	Tl	72 (75-125)			all	J/UJ/A (non-detect)
		S	V		62 (75-125)		all	J/UJ/A (detect)
		S	Al			36 (≤ 20%)	all	J/UJ/A (detect)
		S	Cr			23 (≤ 20%)	all	J/UJ/A (detect)
		S	Cu			34 (≤ 20%)	all	J/UJ/A (detect)
		S	Fe			30 (≤ 20%)	all	J/UJ/A (detect)

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	2/3	S	Pb			75 (≤ 20%)	all	J/UJ/A (detect)
		S	Mg			24 (≤ 20%)	all	J/UJ/A (detect)
		S	Zn			35 (≤ 20%)	all	J/UJ/A (detect)
		S	Hg	159 (80-120)			all	Jdet/A (detect)

Comments: 2/3: Al, Fe, Pb, Mn, Zn > 4X

LDC #: 43079C4b

VALIDATION FINDINGS WORKSHEET
Initial and Continuing Calibration Calculation Verification

Reviewer: ATL
2nd Reviewer: C

METHOD: Trace metals (EPA SW 846 Method 6010/6020/7000)

An initial and continuing calibration verification percent recovery (%R) was recalculated for each type of analysis using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = concentration (in ug/L) of each analyte measured in the analysis of the ICV or CCV solution
True = concentration (in ug/L) of each analyte in the ICV or CCV source

Standard ID	Type of Analysis	Element	Found (~~ug/L~~ mg/L)	True (~~ug/L~~ mg/L)	Recalculated %R	Reported %R	Acceptable (Y/N)
CRI	ICP (Low Level calibration) 12/22 @ 08:48	Zn	0.0687	0.0400	172	172	Y
	ICP/MS (Low Level calibration)						
ICV	ICP (Initial calibration) 12/22 @ 12:20	Cr	0.4847	0.5000	97	97	Y
	ICP/MS (Initial calibration)						
ICV	CVAA (Initial calibration) 12/21 @ 18:48	Hg	0.003264	0.0030	109	109	Y
CCV	ICP (Continuing calibration) 12/22 @ 17:54	Mn	0.4605	0.5000	92	92	Y
	ICP/MS (Continuing calibration)						
CCV	CVAA (Continuing calibration) 12/21 @ 19:10	Hg	0.01054	0.0100	105	105	Y

ICP-MS TUNE	Calculation	Mass	Actual (Mean Counts / Axis)	Required (Counts / Axis)	Recalculated %RSD	Acceptable (Y/N)
	Mass Axis			± 0.1 AMU	NA	
	%RSD			≤ 5% RSD		

Comments:

LDC #: 43079C4b

VALIDATION FINDINGS WORKSHEET
Level IV Recalculation Worksheet

Reviewer: ATL
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Percent recoveries (%R) for an ICP interference check sample, a laboratory control sample and a matrix spike sample were recalculated using the following formula:

$\%R = \frac{Found}{True} \times 100$ Where, Found = Concentration of each analyte measured in the analysis of the sample. For the matrix spike calculation, Found = SSR (spiked sample result) - SR (sample result).
True = Concentration of each analyte in the source.

A sample and duplicate relative percent difference (RPD) was recalculated using the following formula:

$RPD = \frac{|S-D|}{(S+D)/2} \times 100$ Where, S = Original sample concentration
D = Duplicate sample concentration

An ICP serial dilution percent difference (%D) was recalculated using the following formula:

$\%D = \frac{|I-SDR|}{I} \times 100$ Where, I = Initial Sample Result (mg/L)
SDR = Serial Dilution Result (mg/L) (Instrument Reading x 5)

Sample ID	Type of Analysis	Element	Found / S / I (units)	True / D / SDR (units)	Recalculated %R / RPD / %D	Reported %R / RPD / %D	Acceptable (Y/N)
ICSAB	ICP interference check 12/22 @ 08:43	Sb	1.139 mg/L	1.00 mg/L	114	114	Y
LCS	Laboratory control sample 12/22 @ 18:12	As	165.4 mg/kg	166 mg/kg	100	99	Y
2	Matrix spike 12/22 @ 18:21	V	(SSR-SR) 35.1 mg/kg	44.9 mg/kg	78	79	Y
2/3	Duplicate 12/22 @ 18:26	V	60.8 mg/kg	68.0 mg/kg	11	11	Y
1	Post digestion spike 12/22 @ 18:31	Tl	6.8 mg/kg	10.4 mg/kg	65	65	Y
1	ICP serial dilution 12/22 @ 18:35	Al	10372 mg/kg	10800 mg/kg	4	4	Y

Comments: _____

LDC #: 43079C4b

VALIDATION FINDINGS WORKSHEET
Sample Calculation Verification

Page: 1 of 1
Reviewer: ATL
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/6020/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Have results been reported and calculated correctly?
(Y) N N/A Are results within the calibrated range of the instruments and within the linear range of the ICP?
(Y) N N/A Are all detection limits below the CRDL?

Detected analyte results for Hg were recalculated and verified using the following equation:

Concentration = $\frac{(RD)(FV)(Dil)}{(In.\ Vol.)}$

RD = Raw data concentration
FV = Final volume (ml)
In. Vol. = Initial volume (ml) or weight (G)
Dil = Dilution factor

Recalculation: #1

$$3.093 \times \frac{50}{0.395 \times 0.87} \times \frac{1}{1000} = 0.4500$$

$$= 0.45$$

#	Sample ID	Analyte	Reported Concentration (mg/kg)	Calculated Concentration (mg/kg)	Acceptable (Y/N)
	1	Cu (12/22 @ 18:17)	84.5	84.0	Y
	1	Hg (12/21 @ 18:55)	0.45	0.45	Y

Note:

APPENDIX D
USEPA LOW STRESS PURGING AND SAMPLING PROCEDURE

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION I

LOW STRESS (low flow) PURGING AND SAMPLING PROCEDURE FOR THE COLLECTION OF GROUNDWATER SAMPLES FROM MONITORING WELLS

Quality Assurance Unit
U.S. Environmental Protection Agency – Region 1
11 Technology Drive
North Chelmsford, MA 01863

This document contains direction developed solely to provide guidance to U.S. Environmental Protection Agency (EPA) personnel. EPA retains the discretion to adopt approaches that differ from these procedures on a case-by-case basis. The procedures set forth do not create any rights, substantive or procedural, enforceable at law by party to litigation with EPA or the United States.

Prepared by:_____ _____
(Robert Reinhart, Quality Assurance Unit) Date

Approved by:_____ _____
(John Smaldone, Quality Assurance Unit) Date

Revision Page

Date	Rev #	Summary of changes	Sections
7/30/96	1	Finalized	
01/19/10	2	Updated	All sections
3/23/17	3	Updated	All sections
9/20/17	4	Updated	Section 7.0

Table of Contents

1.0 USE OF TERMS

Equipment blank: The equipment blank shall include the pump and the pump's tubing. If tubing is dedicated to the well, the equipment blank needs only to include the pump in subsequent sampling rounds. If the pump and tubing are dedicated to the well, the equipment blank is collected prior to its placement in the well. If the pump and tubing will be used to sample multiple wells, the equipment blank is normally collected after sampling from contaminated wells and not after background wells.

Field duplicates: Field duplicates are collected to determine precision of the sampling procedure. For this procedure, collect duplicate for each analyte group in consecutive order (VOC original, VOC duplicate, SVOC original, SVOC duplicate, etc.).

Indicator field parameters: This SOP uses field measurements of turbidity, dissolved oxygen, specific conductance, temperature, pH, and oxidation/reduction potential (ORP) as indicators of when purging operations are sufficient and sample collection may begin.

Matrix Spike/Matrix Spike Duplicates: Used by the laboratory in its quality assurance program. Consult the laboratory for the sample volume to be collected.

Potentiometric Surface: The level to which water rises in a tightly cased well constructed in a confined aquifer. In an unconfined aquifer, the potentiometric surface is the water table.

QAPP: Quality Assurance Project Plan

SAP: Sampling and Analysis Plan

SOP: Standard operating procedure

Stabilization: A condition that is achieved when all indicator field parameter measurements are sufficiently stable (as described in the "Monitoring Indicator Field Parameters" section) to allow sample collection to begin.

Temperature blank: A temperature blank is added to each sample cooler. The blank is measured upon receipt at the laboratory to assess whether the samples were properly cooled during transit.

Trip blank (VOCs): Trip blank is a sample of analyte-free water taken to the sampling site and returned to the laboratory. The trip blanks (one pair) are added to each sample cooler that contains VOC samples.

2.0 SCOPE & APPLICATION

The goal of this groundwater sampling procedure is to collect water samples that reflect the total mobile organic and inorganic loads (dissolved and colloidal sized fractions) transported through the subsurface under ambient flow conditions, with minimal physical and chemical alterations from sampling operations. This standard operating procedure (SOP) for collecting groundwater samples will help ensure that the project's data quality objectives (DQOs) are met under certain low-flow conditions.

The SOP emphasizes the need to minimize hydraulic stress at the well-aquifer interface by maintaining low water-level drawdowns, and by using low pumping rates during purging and sampling operations. Indicator field parameters (e.g., dissolved oxygen, pH, etc.) are monitored during purging in order to determine when sample collection may begin. Samples properly collected using this SOP are suitable for analysis of groundwater contaminants (volatile and semi-volatile organic analytes, dissolved gases, pesticides, PCBs, metals and other inorganics), or naturally occurring analytes. This SOP is based on Puls, and Barcelona (1996).

This procedure is designed for monitoring wells with an inside diameter (1.5-inches or greater) that can accommodate a positive lift pump with a screen length or open interval ten feet or less and with a water level above the top of the screen or open interval (Hereafter, the "screen or open interval" will be referred to only as "screen interval"). This SOP is not applicable to other well-sampling conditions.

While the use of dedicated sampling equipment is not mandatory, dedicated pumps and tubing can reduce sampling costs significantly by streamlining sampling activities and thereby reducing the overall field costs.

The goal of this procedure is to emphasize the need for consistency in deploying and operating equipment while purging and sampling monitoring wells during each sampling event. This will help to minimize sampling variability.

This procedure describes a general framework for groundwater sampling. Other site specific information (hydrogeological context, conceptual site model (CSM), DQOs, etc.) coupled with systematic planning must be added to the procedure in order to develop an appropriate site specific SAP/QAPP. In addition, the site specific SAP/QAPP must identify the specific equipment that will be used to collect the groundwater samples.

This procedure does not address the collection of water or free product samples from wells containing free phase LNAPLs and/or DNAPLs (light or dense non-aqueous phase

liquids). For this type of situation, the reader may wish to check: Cohen, and Mercer (1993) or other pertinent documents.

This SOP is to be used when collecting groundwater samples from monitoring wells at all Superfund, Federal Facility and RCRA sites in Region 1 under the conditions described herein. Request for modification of this SOP, in order to better address specific situations at individual wells, must include adequate technical justification for proposed changes. All changes and modifications must be approved and included in a revised SAP/QAPP before implementation in field.

3.0 BACKGROUND FOR IMPLEMENTATION

It is expected that the monitoring well screen has been properly located (both laterally and vertically) to intercept existing contaminant plume(s) or along flow paths of potential contaminant migration. Problems with inappropriate monitoring well placement or faulty/improper well installation cannot be overcome by even the best water sampling procedures. This SOP presumes that the analytes of interest are moving (or will potentially move) primarily through the more permeable zones intercepted by the screen interval.

Proper well construction, development, and operation and maintenance cannot be overemphasized. The use of installation techniques that are appropriate to the hydrogeologic setting of the site often prevent "problem well" situations from occurring. During well development, or redevelopment, tests should be conducted to determine the hydraulic characteristics of the monitoring well. The data can then be used to set the purging/sampling rate, and provide a baseline for evaluating changes in well performance and the potential need for well rehabilitation. Note: if this installation data or well history (construction and sampling) is not available or discoverable, for all wells to be sampled, efforts to build a sampling history should commence with the next sampling event.

The pump intake should be located within the screen interval and at a depth that will remain under water at all times. It is recommended that the intake depth and pumping rate remain the same for all sampling events. The mid-point or the lowest historical midpoint of the saturated screen length is often used as the location of the pump intake. For new wells, or for wells without pump intake depth information, the site's SAP/QAPP must provide clear reasons and instructions on how the pump intake depth(s) will be selected, and reason(s) for the depth(s) selected. If the depths to top and bottom of the well screen are not known, the SAP/QAPP will need to describe how the sampling depth will be determined and how the data can be used.

Stabilization of indicator field parameters is used to indicate that conditions are suitable for sampling to begin. Achievement of turbidity levels of less than 5 NTU, and stable drawdowns of less than 0.3 feet, while desirable, are not mandatory. Sample collection

may still take place provided the indicator field parameter criteria in this procedure are met. If after 2 hours of purging indicator field parameters have not stabilized, one of three optional courses of action may be taken: a) continue purging until stabilization is achieved, b) discontinue purging, do not collect any samples, and record in log book that stabilization could not be achieved (documentation must describe attempts to achieve stabilization), c) discontinue purging, collect samples and provide full explanation of attempts to achieve stabilization (note: there is a risk that the analytical data obtained, especially metals and strongly hydrophobic organic analytes, may reflect a sampling bias and therefore, the data may not meet the data quality objectives of the sampling event).

It is recommended that low-flow sampling be conducted when the air temperature is above 32°F (0°C). If the procedure is used below 32°F, special precautions will need to be taken to prevent the groundwater from freezing in the equipment. Because sampling during freezing temperatures may adversely impact the data quality objectives, the need for water sample collection during months when these conditions are likely to occur should be evaluated during site planning and special sampling measures may need to be developed. Ice formation in the flow-through-cell will cause the monitoring probes to act erratically. A transparent flow-through-cell needs to be used to observe if ice is forming in the cell. If ice starts to form on the other pieces of the sampling equipment, additional problems may occur.

4.0 HEALTH & SAFETY

When working on-site, comply with all applicable OSHA requirements and the site's health/safety procedures. All proper personal protection clothing and equipment are to be worn. Some samples may contain biological and chemical hazards. These samples should be handled with suitable protection to skin, eyes, etc.

5.0 CAUTIONS

The following cautions need to be considered when planning to collect groundwater samples when the below conditions occur.

If the groundwater degasses during purging of the monitoring well, dissolved gases and VOCs will be lost. When this happens, the groundwater data for dissolved gases (e.g., methane, ethene, ethane, dissolved oxygen, etc.) and VOCs will need to be qualified. Some conditions that can promote degassing are the use of a vacuum pump (e.g., peristaltic pumps), changes in aperture along the sampling tubing, and squeezing/pinching the pump's tubing which results in a pressure change.

When collecting the samples for dissolved gases and VOCs analyses, avoid aerating the groundwater in the pump's tubing. This can cause loss of the dissolved gases and VOCs in

the groundwater. Having the pump's tubing completely filled prior to sampling will avoid this problem when using a centrifugal pump or peristaltic pump.

Direct sun light and hot ambient air temperatures may cause the groundwater in the tubing and flow-through-cell to heat up. This may cause the groundwater to degas which will result in loss of VOCs and dissolved gases. When sampling under these conditions, the sampler will need to shade the equipment from the sunlight (e.g., umbrella, tent, etc.). If possible, sampling on hot days, or during the hottest time of the day, should be avoided. The tubing exiting the monitoring well should be kept as short as possible to avoid the sun light or ambient air from heating up the groundwater.

Thermal currents in the monitoring well may cause vertical mixing of water in the well bore. When the air temperature is colder than the groundwater temperature, it can cool the top of the water column. Colder water which is denser than warm water sinks to the bottom of the well and the warmer water at the bottom of the well rises, setting up a convection cell. "During low-flow sampling, the pumped water may be a mixture of convecting water from within the well casing and aquifer water moving inward through the screen. This mixing of water during low-flow sampling can substantially increase equilibration times, can cause false stabilization of indicator parameters, can give false indication of redox state, and can provide biological data that are not representative of the aquifer conditions" (Vroblesky 2007).

Failure to calibrate or perform proper maintenance on the sampling equipment and measurement instruments (e.g., dissolved oxygen meter, etc.) can result in faulty data being collected.

Interferences may result from using contaminated equipment, cleaning materials, sample containers, or uncontrolled ambient/surrounding air conditions (e.g., truck/vehicle exhaust nearby).

Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment and/or proper planning to avoid ambient air interferences. Note that the use of dedicated sampling equipment can also significantly reduce the time needed to complete each sampling event, will promote consistency in the sampling, and may reduce sampling bias by having the pump's intake at a constant depth.

Clean and decontaminate all sampling equipment prior to use. All sampling equipment needs to be routinely checked to be free from contaminants and equipment blanks collected to ensure that the equipment is free of contaminants. Check the previous equipment blank data for the site (if they exist) to determine if the previous cleaning procedure removed the contaminants. If contaminants were detected and they are a concern, then a more vigorous cleaning procedure will be needed.

6.0 PERSONNEL QUALIFICATIONS

All field samplers working at sites containing hazardous waste must meet the requirements of the OSHA regulations. OSHA regulations may require the sampler to take the 40 hour OSHA health and safety training course and a refresher course prior to engaging in any field activities, depending upon the site and field conditions.

The field samplers must be trained prior to the use of the sampling equipment, field instruments, and procedures. Training is to be conducted by an experienced sampler before initiating any sampling procedure.

The entire sampling team needs to read, and be familiar with, the site Health and Safety Plan, all relevant SOPs, and SAP/QAPP (and the most recent amendments) before going onsite for the sampling event. It is recommended that the field sampling leader attest to the understanding of these site documents and that it is recorded.

7.0 EQUIPMENT AND SUPPLIES

A. Informational materials for sampling event

A copy of the current Health and Safety Plan, SAP/QAPP, monitoring well construction data, location map(s), field data from last sampling event, manuals for sampling, and the monitoring instruments' operation, maintenance, and calibration manuals should be brought to the site.

B. Well keys.

C. Extraction device

Adjustable rate, submersible pumps (e.g., centrifugal, bladder, etc.) which are constructed of stainless steel or polytetrafluoroethylene (PTFE, i.e. Teflon®) are preferred. PTFE, however, should not be used when sampling for per- and polyfluoroalkyl substances (PFAS) as it is likely to contain these substances.

Note: If extraction devices constructed of other materials are to be used, adequate information must be provided to show that the substituted materials do not leach contaminants nor cause interferences to the analytical procedures to be used. Acceptance of these materials must be obtained before the sampling event.

If bladder pumps are selected for the collection of VOCs and dissolved gases, the pump setting should be set so that one pulse will deliver a water volume that is sufficient to fill a 40 mL VOC vial. This is not mandatory, but is considered a "best practice". For the proper operation, the bladder pump will need a minimum amount of water above the pump; consult the manufacturer for the recommended submergence. The pump's recommended submergence value should be determined during the planning stage, since it may influence well construction and placement of dedicated pumps where water-level fluctuations are significant.

Adjustable rate, peristaltic pumps (suction) are to be used with caution when collecting samples for VOCs and dissolved gases (e.g., methane, carbon dioxide, etc.) analyses. Additional information on the use of peristaltic pumps can be found in Appendix A. If peristaltic pumps are used, the inside diameter of the rotor head tubing needs to match the inside diameter of the tubing installed in the monitoring well.

Inertial pumping devices (motor driven or manual) are not recommended. These devices frequently cause greater disturbance during purging and sampling, and are less easily controlled than submersible pumps (potentially increasing turbidity and sampling variability, etc.). This can lead to sampling results that are adversely affected by purging and sampling operations, and a higher degree of data variability.

D. Tubing

PTFE (Teflon®) or PTFE-lined polyethylene tubing are preferred when sampling is to include VOCs, SVOCs, pesticides, PCBs and inorganics. As discussed in the previous section, PTFE tubing should not be used when sampling for PFAS. In this case, a suitable alternative such as high-density polyethylene tubing should be used.

PVC, polypropylene or polyethylene tubing may be used when collecting samples for metal and other inorganics analyses.

Note: If tubing constructed of other materials is to be used, adequate information must be provided to show that the substituted materials do not leach contaminants nor cause interferences to the analytical procedures to be used. Acceptance of these materials must be obtained before the sampling event.

The use of 1/4 inch or 3/8 inch (inside diameter) tubing is recommended. This will help ensure that the tubing remains liquid filled when operating at very low pumping rates when using centrifugal and peristaltic pumps.

Silastic tubing should be used for the section around the rotor head of a peristaltic pump. It should be less than a foot in length. The inside diameter of the tubing used at the pump rotor head must be the same as the inside diameter of tubing placed in the well. A tubing connector is used to connect the pump rotor head tubing to the well tubing. Alternatively, the two pieces of tubing can be connected to each other by placing the one end of the tubing inside the end of the other tubing. The tubing must not be reused.

E. The water level measuring device

Electronic ”tape”, pressure transducer, water level sounder/level indicator, etc. should be capable of measuring to 0.01 foot accuracy. Recording pressure transducers, mounted above the pump, are especially helpful in tracking water levels during pumping operations, but their use must include check measurements with a water level “tape” at the start and end of each sampling event.

F. Flow measurement supplies

Graduated cylinder (size according to flow rate) and stopwatch usually will suffice.

Large graduated bucket used to record total water purged from the well.

G. Interface probe

To be used to check on the presence of free phase liquids (LNAPL, or DNAPL) before purging begins (as needed).

H. Power source (generator, nitrogen tank, battery, etc.)

When a gasoline generator is used, locate it downwind and at least 30 feet from the well so that the exhaust fumes do not contaminate samples.

I. Indicator field parameter monitoring instruments

Use of a multi-parameter instrument capable of measuring pH, oxidation/reduction potential (ORP), dissolved oxygen (DO), specific conductance, temperature, and coupled with a flow-through-cell is required when measuring all indicator field parameters, except turbidity. Turbidity is collected using a separate instrument. Record equipment/instrument identification (manufacturer, and model number).

Transparent, small volume flow-through-cells (e.g., 250 mLs or less) are preferred. This allows observation of air bubbles and sediment buildup in the cell, which can interfere with the operation of the monitoring instrument probes, to be easily detected. A small volume

cell facilitates rapid turnover of water in the cell between measurements of the indicator field parameters.

It is recommended to use a flow-through-cell and monitoring probes from the same manufacturer and model to avoid incompatibility between the probes and flow-through-cell.

Turbidity samples are collected before the flow-through-cell. A "T" connector coupled with a valve is connected between the pump's tubing and flow-through-cell. When a turbidity measurement is required, the valve is opened to allow the groundwater to flow into a container. The valve is closed and the container sample is then placed in the turbidimeter.

Standards are necessary to perform field calibration of instruments. A minimum of two standards are needed to bracket the instrument measurement range for all parameters except ORP which use a Zobell solution as a standard. For dissolved oxygen, a wet sponge used for the 100% saturation and a zero dissolved oxygen solution are used for the calibration.

Barometer (used in the calibration of the Dissolved Oxygen probe) and the conversion formula to convert the barometric pressure into the units of measure used by the Dissolved Oxygen meter are needed.

J. Decontamination supplies

Includes (for example) non-phosphate detergent, distilled/deionized water, isopropyl alcohol, etc.

K. Record keeping supplies

Logbook(s), well purging forms, chain-of-custody forms, field instrument calibration forms, etc.

L. Sample bottles

M. Sample preservation supplies (as required by the analytical methods)

N. Sample tags or labels

O. PID or FID instrument

If appropriate, to detect VOCs for health and safety purposes, and provide qualitative field evaluations.

P. Miscellaneous Equipment

Equipment to keep the sampling apparatus shaded in the summer (e.g., umbrella) and from freezing in the winter. If the pump's tubing is allowed to heat up in the warm weather, the cold groundwater may degas as it is warmed in the tubing.

8.0 EQUIPMENT/INSTRUMENT CALIBRATION

Prior to the sampling event, perform maintenance checks on the equipment and instruments according to the manufacturer's manual and/or applicable SOP. This will ensure that the equipment/instruments are working properly before they are used in the field.

Prior to sampling, the monitoring instruments must be calibrated and the calibration documented. The instruments are calibrated using U.S Environmental Protection Agency Region 1 *Calibration of Field Instruments (temperature, pH, dissolved oxygen, conductivity/specific conductance, oxidation/reduction [ORP], and turbidity),* March 23, 2017, or latest version or from one of the methods listed in 40CFR136, 40CFR141 and SW-846.

The instruments shall be calibrated at the beginning of each day. If the field measurement falls outside the calibration range, the instrument must be re-calibrated so that all measurements fall within the calibration range. At the end of each day, a calibration check is performed to verify that instruments remained in calibration throughout the day. This check is performed while the instrument is in measurement mode, not calibration mode. If the field instruments are being used to monitor the natural attenuation parameters, then a calibration check at mid-day is highly recommended to ensure that the instruments did not drift out of calibration. Note: during the day if the instrument reads zero or a negative number for dissolved oxygen, pH, specific conductance, or turbidity (negative value only), this indicates that the instrument drifted out of calibration or the instrument is malfunctioning. If this situation occurs the data from this instrument will need to be qualified or rejected.

9.0 PRELIMINARY SITE ACTIVITIES (as applicable)

Check the well for security (damage, evidence of tampering, missing lock, etc.) and record pertinent observations (include photograph as warranted).

If needed, lay out a sheet of clean polyethylene for monitoring and sampling equipment, unless equipment is elevated above the ground (e.g., on a table, etc.).

Remove well cap and if appropriate measure VOCs at the rim of the well with a PID or FID instrument and record reading in field logbook or on the well purge form.

If the well casing does not have an established reference point (usually a V-cut or indelible mark in the well casing), make one. Describe its location and record the date of the mark in the logbook (consider a photographic record as well). All water level measurements must be recorded relative to this reference point (and the altitude of this point should be determined using techniques that are appropriate to site's DQOs.

If water-table or potentiometric surface map(s) are to be constructed for the sampling event, perform synoptic water level measurement round (in the shortest possible time) before any purging and sampling activities begin. If possible, measure water level depth (to 0.01 ft.) and total well depth (to 0.1 ft.) the day before sampling begins, in order to allow for re-settlement of any particulates in the water column. This is especially important for those wells that have not been recently sampled because sediment buildup in the well may require the well to be redeveloped. If measurement of total well depth is not made the day before, it should be measured after sampling of the well is complete. All measurements must be taken from the established referenced point. Care should be taken to minimize water column disturbance.

Check newly constructed wells for the presence of LNAPLs or DNAPLs before the initial sampling round. If none are encountered, subsequent check measurements with an interface probe may not be necessary unless analytical data or field analysis signal a worsening situation. This SOP cannot be used in the presence of LNAPLs or DNAPLs. If NAPLs are present, the project team must decide upon an alternate sampling method. All project modifications must be approved and documented prior to implementation.

If available check intake depth and drawdown information from previous sampling event(s) for each well. Duplicate, to the extent practicable, the intake depth and extraction rate (use final pump dial setting information) from previous event(s). If changes are made in the intake depth or extraction rate(s) used during previous sampling event(s), for either portable or dedicated extraction devices, record new values, and explain reasons for the changes in the field logbook.

10.0 PURGING AND SAMPLING PROCEDURE

Purging and sampling wells in order of increasing chemical concentrations (known or anticipated) are preferred.

The use of dedicated pumps is recommended to minimize artificial mobilization and entrainment of particulates each time the well is sampled. Note that the use of dedicated sampling equipment can also significantly reduce the time needed to complete each sampling event, will promote consistency in the sampling, and may reduce sampling bias by having the pump's intake at a constant depth.

A. Initial Water Level

Measure the water level in the well before installing the pump if a non-dedicated pump is being used. The initial water level is recorded on the purge form or in the field logbook.

B. Install Pump

Lower pump, safety cable, tubing and electrical lines slowly (to minimize disturbance) into the well to the appropriate depth (may not be the mid-point of the screen/open interval). The Sampling and Analysis Plan/Quality Assurance Project Plan should specify the sampling depth (used previously), or provide criteria for selection of intake depth for each new well. If possible keep the pump intake at least two feet above the bottom of the well, to minimize mobilization of particulates present in the bottom of the well.

Pump tubing lengths, above the top of well casing should be kept as short as possible to minimize heating the groundwater in the tubing by exposure to sun light and ambient air temperatures. Heating may cause the groundwater to degas, which is unacceptable for the collection of samples for VOC and dissolved gases analyses.

C. Measure Water Level

Before starting pump, measure water level. Install recording pressure transducer, if used to track drawdowns, to initialize starting condition.

D. Purge Well

From the time the pump starts purging and until the time the samples are collected, the purged water is discharged into a graduated bucket to determine the total volume of groundwater purged. This information is recorded on the purge form or in the field logbook.

Start the pump at low speed and slowly increase the speed until discharge occurs. Check water level. Check equipment for water leaks and if present fix or replace the affected equipment. Try to match pumping rate used during previous sampling event(s). Otherwise, adjust pump speed until there is little or no water level drawdown. If the

minimal drawdown that can be achieved exceeds 0.3 feet, but remains stable, continue purging.

Monitor and record the water level and pumping rate every five minutes (or as appropriate) during purging. Record any pumping rate adjustments (both time and flow rate). Pumping rates should, as needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. Adjustments are best made in the first fifteen minutes of pumping in order to help minimize purging time. During pump start-up, drawdown may exceed the 0.3 feet target and then "recover" somewhat as pump flow adjustments are made. Purge volume calculations should utilize stabilized drawdown value, not the initial drawdown. If the initial water level is above the top of the screen do not allow the water level to fall into the well screen. The final purge volume must be greater than the stabilized drawdown volume plus the pump's tubing volume. If the drawdown has exceeded 0.3 feet and stabilizes, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are collected.

Avoid the use of constriction devices on the tubing to decrease the flow rate because the constrictor will cause a pressure difference in the water column. This will cause the groundwater to degas and result in a loss of VOCs and dissolved gasses in the groundwater samples.

Note: the flow rate used to achieve a stable pumping level should remain constant while monitoring the indicator parameters for stabilization and while collecting the samples.

Wells with low recharge rates may require the use of special pumps capable of attaining very low pumping rates (e.g., bladder, peristaltic), and/or the use of dedicated equipment. For new monitoring wells, or wells where the following situation has not occurred before, if the recovery rate to the well is less than 50 mL/min., or the well is being essentially dewatered during purging, the well should be sampled as soon as the water level has recovered sufficiently to collect the volume needed for all anticipated samples. The project manager or field team leader will need to make the decision when samples should be collected, how the sample is to be collected, and the reasons recorded on the purge form or in the field logbook. A water level measurement needs to be performed and recorded before samples are collected. If the project manager decides to collect the samples using the pump, it is best during this recovery period that the pump intake tubing not be removed, since this will aggravate any turbidity problems. Samples in this specific situation may be collected without stabilization of indicator field parameters. Note that field conditions and efforts to overcome problematic situations must be recorded in order to support field decisions to deviate from normal procedures described in this SOP. If this type of problematic situation persists in a well, then water sample collection should be

changed to a passive or no-purge method, if consistent with the site's DQOs, or have a new well installed.

E. Monitor Indicator Field Parameters

After the water level has stabilized, connect the "T" connector with a valve and the flow-through-cell to monitor the indicator field parameters. If excessive turbidity is anticipated or encountered with the pump startup, the well may be purged for a while without connecting up the flow-through-cell, in order to minimize particulate buildup in the cell (This is a judgment call made by the sampler). Water level drawdown measurements should be made as usual. If possible, the pump may be installed the day before purging to allow particulates that were disturbed during pump insertion to settle.

During well purging, monitor indicator field parameters (turbidity, temperature, specific conductance, pH, ORP, DO) at a frequency of five minute intervals or greater. The pump's flow rate must be able to "turn over" at least one flow-through-cell volume between measurements (for a 250 mL flow-through-cell with a flow rate of 50 mLs/min., the monitoring frequency would be every five minutes; for a 500 mL flow-through-cell it would be every ten minutes). If the cell volume cannot be replaced in the five minute interval, then the time between measurements must be increased accordingly. Note: during the early phase of purging, emphasis should be put on minimizing and stabilizing pumping stress, and recording those adjustments followed by stabilization of indicator parameters. Purging is considered complete and sampling may begin when all the above indicator field parameters have stabilized. Stabilization is considered to be achieved when three consecutive readings are within the following limits:

Turbidity (10% for values greater than 5 NTU; if three Turbidity values are less than 5 NTU, consider the values as stabilized),
Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
Specific Conductance (3%),
Temperature (3%),
pH (± 0.1 unit),
Oxidation/Reduction Potential (±10 millivolts).

All measurements, except turbidity, must be obtained using a flow-through-cell. Samples for turbidity measurements are obtained before water enters the flow-through-cell. Transparent flow-through-cells are preferred, because they allow field personnel to watch for particulate build-up within the cell. This build-up may affect indicator field parameter values measured within the cell. If the cell needs to be cleaned during purging operations, continue pumping and disconnect cell for cleaning, then reconnect after cleaning and

continue monitoring activities. Record start and stop times and give a brief description of cleaning activities.

The flow-through-cell must be designed in a way that prevents gas bubble entrapment in the cell. Placing the flow-through-cell at a 45 degree angle with the port facing upward can help remove bubbles from the flow-through-cell (see Appendix B Low-Flow Setup Diagram). Throughout the measurement process, the flow-through-cell must remain free of any gas bubbles. Otherwise, the monitoring probes may act erratically. When the pump is turned off or cycling on/off (when using a bladder pump), water in the cell must not drain out. Monitoring probes must remain submerged in water at all times.

F. Collect Water Samples

When samples are collected for laboratory analyses, the pump's tubing is disconnected from the "T" connector with a valve and the flow-through-cell. The samples are collected directly from the pump's tubing. Samples must not be collected from the flow-through-cell or from the "T" connector with a valve.

VOC samples are normally collected first and directly into pre-preserved sample containers. However, this may not be the case for all sampling locations; the SAP/QAPP should list the order in which the samples are to be collected based on the project's objective(s). Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.

If the pump's flow rate is too high to collect the VOC/dissolved gases samples, collect the other samples first. Lower the pump's flow rate to a reasonable rate and collect the VOC/dissolved gases samples and record the new flow rate.

During purging and sampling, the centrifugal/peristaltic pump tubing must remain filled with water to avoid aeration of the groundwater. It is recommended that 1/4 inch or 3/8 inch (inside diameter) tubing be used to help ensure that the sample tubing remains water filled. If the pump tubing is not completely filled to the sampling point, use the following procedure to collect samples: collect non-VOC/dissolved gases samples first, then increase flow rate slightly until the water completely fills the tubing, collect the VOC/dissolved gases samples, and record new drawdown depth and flow rate.

For bladder pumps that will be used to collect VOC or dissolved gas samples, it is recommended that the pump be set to deliver long pulses of water so that one pulse will fill a 40 mL VOC vial.

Use pre-preserved sample containers or add preservative, as required by analytical methods, to the samples immediately after they are collected. Check the analytical methods

(e.g. EPA SW-846, 40 CFR 136, water supply, etc.) for additional information on preservation.

If determination of filtered metal concentrations is a sampling objective, collect filtered water samples using the same low flow procedures. The use of an in-line filter (transparent housing preferred) is required, and the filter size (0.45 µm is commonly used) should be based on the sampling objective. Pre-rinse the filter with groundwater prior to sample collection. Make sure the filter is free of air bubbles before samples are collected. Preserve the filtered water sample immediately. Note: filtered water samples are not an acceptable substitute for unfiltered samples when the monitoring objective is to obtain chemical concentrations of total mobile contaminants in groundwater for human health or ecological risk calculations.

Label each sample as collected. Samples requiring cooling will be placed into a cooler with ice or refrigerant for delivery to the laboratory. Metal samples after acidification to a pH less than 2 do not need to be cooled.

G. Post Sampling Activities

If a recording pressure transducer is used to track drawdown, re-measure water level with tape.

After collection of samples, the pump tubing may be dedicated to the well for re-sampling (by hanging the tubing inside the well), decontaminated, or properly discarded.

Before securing the well, measure and record the well depth (to 0.1 ft.), if not measured the day before purging began. Note: measurement of total well depth annually is usually sufficient after the initial low stress sampling event. However, a greater frequency may be needed if the well has a “silting” problem or if confirmation of well identity is needed.

Secure the well.

11.0 DECONTAMINATION

Decontaminate sampling equipment prior to use in the first well, and then following sampling of each subsequent well. Pumps should not be removed between purging and sampling operations. The pump, tubing, support cable and electrical wires which were in contact with the well should be decontaminated by one of the procedures listed below.

The use of dedicated pumps and tubing will reduce the amount of time spent on decontamination of the equipment. If dedicated pumps and tubing are used, only the initial sampling event will require decontamination of the pump and tubing.

Note if the previous equipment blank data showed that contaminant(s) were present after using the below procedure or the one described in the SAP/QAPP, a more vigorous procedure may be needed.

Procedure 1

Decontaminating solutions can be pumped from either buckets or short PVC casing sections through the pump and tubing. The pump may be disassembled and flushed with the decontaminating solutions. It is recommended that detergent and alcohol be used sparingly in the decontamination process and water flushing steps be extended to ensure that any sediment trapped in the pump is removed. The pump exterior and electrical wires must be rinsed with the decontaminating solutions, as well. The procedure is as follows:

Flush the equipment/pump with potable water.

Flush with non-phosphate detergent solution. If the solution is recycled, the solution must be changed periodically.

Flush with potable or distilled/deionized water to remove all of the detergent solution. If the water is recycled, the water must be changed periodically.

Optional - flush with isopropyl alcohol (pesticide grade; must be free of ketones {e.g., acetone}) or with methanol. This step may be required if the well is highly contaminated or if the equipment blank data from the previous sampling event show that the level of contaminants is significant.

Flush with distilled/deionized water. This step must remove all traces of alcohol (if used) from the equipment. The final water rinse must not be recycled.

Procedure 2

Steam clean the outside of the submersible pump.

Pump hot potable water from the steam cleaner through the inside of the pump. This can be accomplished by placing the pump inside a three or four inch diameter PVC pipe with end cap. Hot water from the steam cleaner jet will be directed inside the PVC pipe and the pump exterior will be cleaned. The hot water from the steam cleaner will then be pumped from the PVC pipe through the pump and collected into another container. Note: additives or solutions should not be added to the steam cleaner.

Pump non-phosphate detergent solution through the inside of the pump. If the solution is recycled, the solution must be changed periodically.

Pump potable water through the inside of the pump to remove all of the detergent solution. If the solution is recycled, the solution must be changed periodically.

Pump distilled/deionized water through the pump. The final water rinse must not be recycled.

12.0 FIELD QUALITY CONTROL

Quality control samples are required to verify that the sample collection and handling process has not compromised the quality of the groundwater samples. All field quality control samples must be prepared the same as regular investigation samples with regard to sample volume, containers, and preservation. Quality control samples include field duplicates, equipment blanks, matrix spike/matrix spike duplicates, trip blanks (VOCs), and temperature blanks.

13.0 FIELD LOGBOOK

A field log shall be kept to document all groundwater field monitoring activities (see Appendix C, example table), and record the following for each well:

Site name, municipality, state.

Well identifier, latitude-longitude or state grid coordinates.

Measuring point description (e.g., north side of PVC pipe).

Well depth, and measurement technique.

Well screen length.

Pump depth.

Static water level depth, date, time and measurement technique.

Presence and thickness of immiscible liquid (NAPL) layers and detection method.

Pumping rate, drawdown, indicator parameters values, calculated or measured total volume pumped, and clock time of each set of measurements.

Type of tubing used and its length.

Type of pump used.

Clock time of start and end of purging and sampling activity.

Types of sample bottles used and sample identification numbers.

Preservatives used.

Parameters requested for analyses.

Field observations during sampling event.

Name of sample collector(s).

Weather conditions, including approximate ambient air temperature.

QA/QC data for field instruments.

Any problems encountered should be highlighted.

Description of all sampling/monitoring equipment used, including trade names, model number, instrument identification number, diameters, material composition, etc.

14.0 DATA REPORT

Data reports are to include laboratory analytical results, QA/QC information, field indicator parameters measured during purging, field instrument calibration information, and whatever other field logbook information is needed to allow for a full evaluation of data usability.

Note: the use of trade, product, or firm names in this sampling procedure is for descriptive purposes only and does not constitute endorsement by the U.S. EPA.

15.0 REFERENCES

Cohen, R.M. and J.W. Mercer, 1993, *DNAPL Site Evaluation*; C.K. Smoley (CRC Press), Boca Raton, Florida.

Robert W. Puls and Michael J. Barcelona, *Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures*, April 1996 (EPA/540/S-95/504).

U.S. Environmental Protection Agency, 1992, *RCRA Ground-Water Monitoring: Draft Technical Guidance*; Washington, DC (EPA/530-R-93-001).

U.S. Environmental Protection Agency, 1987, *A Compendium of Superfund Field Operations Methods*; Washington, DC (EPA/540/P-87/001).

U.S Environmental Protection Agency, Region 1, *Calibration of Field Instruments (temperature, pH, dissolved oxygen, conductivity/specific conductance, oxidation/reduction [ORP], and turbidity),* March 23, 2017 or latest version.

U.S Environmental Protection Agency, EPA SW-846.

U.S Environmental Protection Agency, 40 CFR 136.

U.S Environmental Protection Agency, 40 CFR 141.

Vroblesky, Don A., Clifton C. Casey, and Mark A. Lowery, Summer 2007, Influence of Dissolved Oxygen Convection on Well Sampling, *Ground Water Monitoring & Remediation* 27, no. 3: 49-58.

APPENDIX A

PERISTALTIC PUMPS

Before selecting a peristaltic pump to collect groundwater samples for VOCs and/or dissolved gases, (e.g., methane, carbon dioxide, etc.) consideration should be given to the following:

- The decision of whether or not to use a peristaltic pump is dependent on the intended use of the data.
- If the additional sampling error that may be introduced by this device is NOT of concern for the VOC/dissolved gases data's intended use, then this device may be acceptable.
- If minor differences in the groundwater concentrations could affect the decision, such as to continue or terminate groundwater cleanup or whether the cleanup goals have been reached, then this device should NOT be used for VOC/dissolved gases sampling. In these cases, centrifugal or bladder pumps are a better choice for more accurate results.

EPA and USGS have documented their concerns with the use of the peristaltic pumps to collect water sample in the below documents.

- "Suction Pumps are not recommended because they may cause degassing, pH modification, and loss of volatile compounds" *A Compendium of Superfund Field Operations Methods*, EPA/540/P-87/001, December 1987.
- "The agency does not recommend the use of peristaltic pumps to sample ground water particularly for volatile organic analytes" *RCRA Ground-Water Monitoring Draft Technical Guidance*, EPA Office of Solid Waste, November 1992.
- "The peristaltic pump is limited to shallow applications and can cause degassing resulting in alteration of pH, alkalinity, and volatiles loss", *Low-flow (Minimal drawdown) Ground-Water Sampling Procedures*, by Robert Puls & Michael Barcelona, April 1996, EPA/540/S-95/504.
- "Suction-lift pumps, such as peristaltic pumps, can operate at a very low pumping rate; however, using negative pressure to lift the sample can result in the loss of volatile analytes", USGS Book 9 Techniques of Water-Resources Investigation, Chapter A4. (Version 2.0, 9/2006).

APPENDIX B

SUMMARY OF SAMPLING INSTRUCTIONS

These instructions are for using an adjustable rate, submersible pump or a peristaltic pump with the pump's intake placed at the midpoint of a 10 foot or less well screen or an open interval. The water level in the monitoring well is above the top of the well screen or open interval, the ambient temperature is above 32°F, and the equipment is not dedicated. Field instruments are already calibrated. The equipment is setup according to the diagram at the end of these instructions.

1. Review well installation information. Record well depth, length of screen or open interval, and depth to top of the well screen. Determine the pump's intake depth (e.g., mid-point of screen/open interval).

2. On the day of sampling, check security of the well casing, perform any safety checks needed for the site, lay out a sheet of polyethylene around the well (if necessary), and setup the equipment. If necessary a canopy or an equivalent item can be setup to shade the pump's tubing and flow-through-cell from the sun light to prevent the sun light from heating the groundwater.

3. Check well casing for a reference mark. If missing, make a reference mark. Measure the water level (initial) to 0.01 ft. and record this information.

4. Install the pump's intake to the appropriate depth (e.g., midpoint) of the well screen or open interval. Do not turn-on the pump at this time.

5. Measure water level and record this information.

6. Turn-on the pump and discharge the groundwater into a graduated waste bucket. Slowly increase the flow rate until the water level starts to drop. Reduce the flow rate slightly so the water level stabilizes. Record the pump's settings. Calculate the flow rate using a graduated container and a stop watch. Record the flow rate. Do not let the water level drop below the top of the well screen.

If the groundwater is highly turbid or discolored, continue to discharge the water into the bucket until the water clears (visual observation); this usually takes a few minutes. The turbid or discolored water is usually from the well-being disturbed during the pump installation. If the water does not clear, then you need to make a choice whether to continue purging the well (hoping that it will clear after a reasonable time) or continue to

the next step. Note, it is sometimes helpful to install the pump the day before the sampling event so that the disturbed materials in the well can settle out.

If the water level drops to the top of the well screen during the purging of the well, stop purging the well, and do the following:

> Wait for the well to recharge to a sufficient volume so samples can be collected. This may take a while (pump may be removed from well, if turbidity is not a problem). The project manager will need to make the decision when samples should be collected and the reasons recorded in the site's log book. A water level measurement needs to be performed and recorded before samples are collected. When samples are being collected, the water level must not drop below the top of the screen or open interval. Collect the samples from the pump's tubing. Always collect the VOCs and dissolved gases samples first. Normally, the samples requiring a small volume are collected before the large volume samples are collected just in case there is not sufficient water in the well to fill all the sample containers. All samples must be collected, preserved, and stored according to the analytical method. Remove the pump from the well and decontaminate the sampling equipment.

If the water level has dropped 0.3 feet or less from the initial water level (water level measure before the pump was installed); proceed to Step 7. If the water level has dropped more than 0.3 feet, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are be collected.

7. Attach the pump's tubing to the "T" connector with a valve (or a three-way stop cock). The pump's tubing from the well casing to the "T" connector must be as short as possible to prevent the groundwater in the tubing from heating up from the sun light or from the ambient air. Attach a short piece of tubing to the other end of the end of the "T" connector to serve as a sampling port for the turbidity samples. Attach the remaining end of the "T" connector to a short piece of tubing and connect the tubing to the flow-through-cell bottom port. To the top port, attach a small piece of tubing to direct the water into a calibrated waste bucket. Fill the cell with the groundwater and remove all gas bubbles from the cell. Position the flow-through-cell in such a way that if gas bubbles enter the cell they can easily exit the cell. If the ports are on the same side of the cell and the cell is cylindrical shape, the cell can be placed at a 45-degree angle with the ports facing upwards; this position should keep any gas bubbles entering the cell away from the monitoring probes and allow the gas bubbles to exit the cell easily (see Low-Flow Setup Diagram). Note:

make sure there are no gas bubbles caught in the probes' protective guard; you may need to shake the cell to remove these bubbles.

8. Turn-on the monitoring probes and turbidity meter.

9. Record the temperature, pH, dissolved oxygen, specific conductance, and oxidation/reduction potential measurements. Open the valve on the "T" connector to collect a sample for the turbidity measurement, close the valve, do the measurement, and record this measurement. Calculate the pump's flow rate from the water exiting the flow-through-cell using a graduated container and a stop watch, and record the measurement. Measure and record the water level. Check flow-through-cell for gas bubbles and sediment; if present, remove them.

10. Repeat Step 9 every 5 minutes or as appropriate until monitoring parameters stabilized. Note: at least one flow-through-cell volume must be exchanged between readings. If not, the time interval between readings will need to be increased. Stabilization is achieved when three consecutive measurements are within the following limits:

Turbidity (10% for values greater than 5 NTUs; if three Turbidity values are less than 5 NTUs, consider the values as stabilized),
Dissolved Oxygen (10% for values greater than 0.5 mg/L, if three Dissolved Oxygen values are less than 0.5 mg/L, consider the values as stabilized),
Specific Conductance (3%),
Temperature (3%),
pH (± 0.1 unit),
Oxidation/Reduction Potential (±10 millivolts).

If these stabilization requirements do not stabilize in a reasonable time, the probes may have been coated from the materials in the groundwater, from a buildup of sediment in the flow-through-cell, or a gas bubble is lodged in the probe. The cell and the probes will need to be cleaned. Turn-off the probes (not the pump), disconnect the cell from the "T" connector and continue to purge the well. Disassemble the cell, remove the sediment, and clean the probes according to the manufacturer's instructions. Reassemble the cell and connect the cell to the "T" connector. Remove all gas bubbles from the cell, turn-on the probes, and continue the measurements. Record the time the cell was cleaned.

11. When it is time to collect the groundwater samples, turn-off the monitoring probes, and disconnect the pump's tubing from the "T" connector. If you are using a centrifugal or peristaltic pump check the pump's tubing to determine if the tubing is completely filled with water (no air space).

All samples must be collected and preserved according to the analytical method. VOCs and dissolved gases samples are normally collected first and directly into pre-preserved sample containers. However, this may not be the case for all sampling locations; the SAP/QAPP should list the order in which the samples are to be collected based on the project's objective(s). Fill all sample containers by allowing the pump discharge to flow gently down the inside of the container with minimal turbulence.

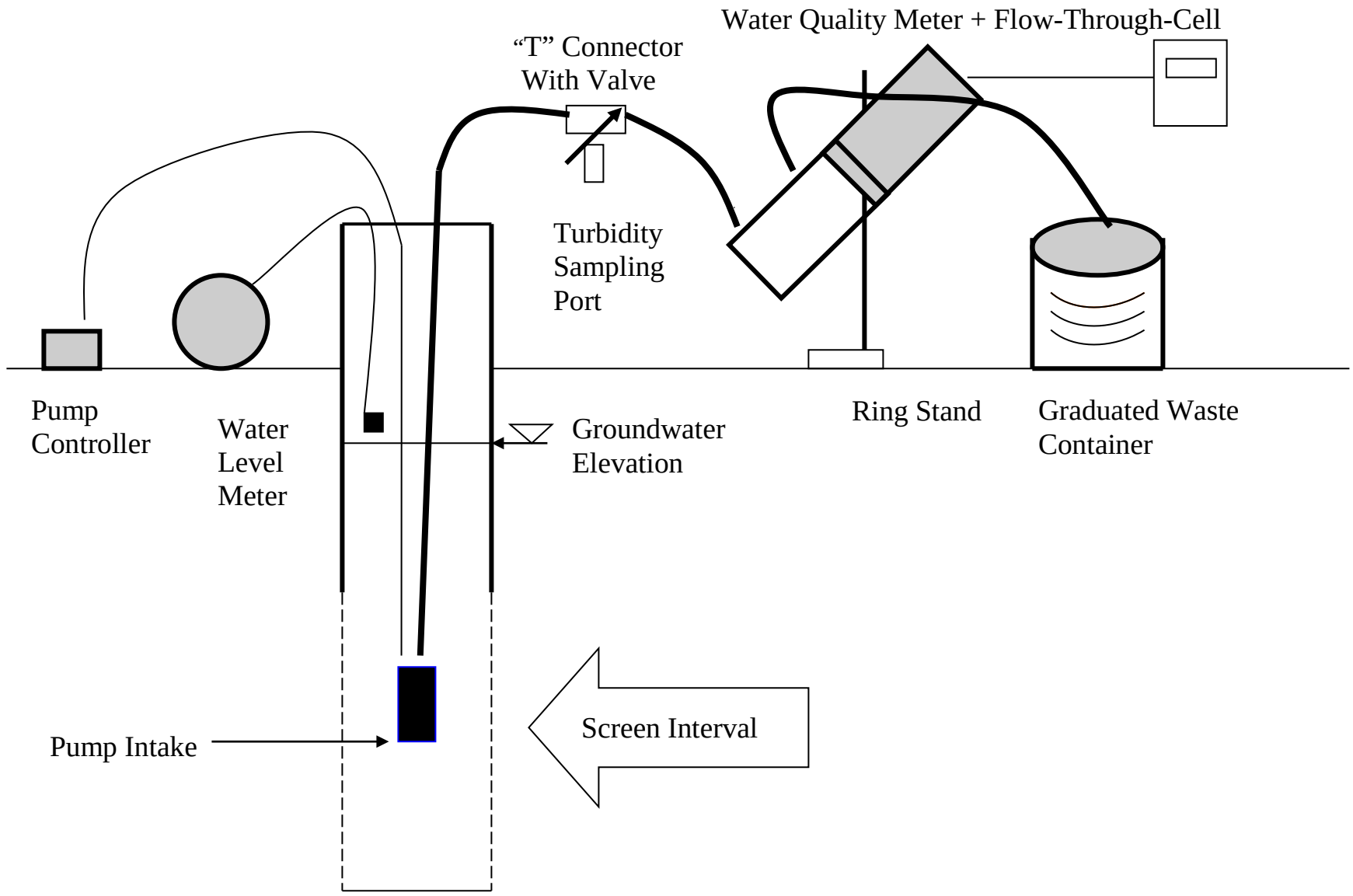
If the pump's tubing is not completely filled with water and the samples are being collected for VOCs and/or dissolved gases analyses using a centrifugal or peristaltic pump, do the following:

> All samples must be collected and preserved according to the analytical method. The VOCs and the dissolved gases (e.g., methane, ethane, ethene, and carbon dioxide) samples are collected last. When it becomes time to collect these samples increase the pump's flow rate until the tubing is completely filled. Collect the samples and record the new flow rate.

12. Store the samples according to the analytical method.

13. Record the total purged volume (graduated waste bucket). Remove the pump from the well and decontaminate the sampling equipment.

Low-Flow Setup Diagram



APPENDIX C

EXAMPLE (Minimum Requirements)

WELL PURGING-FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name)_____ Depth to _____/_____ of screen
Well Number_____ Date_____ (below MP) top bottom
Field Personnel_____ Pump Intake at (ft. below MP)_____
Sampling Organization_____ Purging Device; (pump type)_____
Identify MP_____ Total Volume Purged _____

Clock Time 24 HR	Water Depth below MP ft	Pump Dial[1]	Purge Rate ml/min	Cum. Volume Purged liters	Temp. "C	Spec. Cond.[2] µS/cm	pH	ORP[3] mv	DO mg/L	Tur-bidity NTU	Comments
Stabilization Criteria					3%	3%	±0.1	±10 mv	10%	10%	

1. Pump dial setting (for example: hertz, cycles/min, etc).
2. µSiemens per cm(same as µmhos/cm)at 25°C.
3. Oxidation reduction potential (ORP)

APPENDIX E
PROJECT TEAM QUALIFICATIONS

James Rhodes, PG • COO

PROFESSIONAL EXPERIENCE

PWGC: 25 years

PRIOR: 5 years

AREAS OF EXPERTISE

Brownfields/Redevelopment Management
Environmental Compliance Management
Property/Real Estate Due Diligence Expert – Transaction & Environmental
Site Assessment & Reuse Analysis
Environmental & Remedial Investigations - Soil/Groundwater and Air Quality

EDUCATION & TRAINING/CERTIFICATION

MS, Earth Science/Hydrogeology, Adelphi University, NY
BS, Geology, SUNY Oneonta, NY
Executive Education (ACEC)
Leading Professional Service Firms - Harvard Business School
Licensed Professional Geologist - NYS
Phase I Environmental Inspector - Environmental Assessment Association
Professional Geologist - American Institute of Professional Geologists
Licensed Real Estate Salesperson - NY
OSHA HAZWOPER 40-hr.

PROFILE

In 2017, James Rhodes was named PWGC's Chief Operating Officer. In this role Mr. Rhodes is responsible for the operations of the business, working in tandem with the CEO and President. Roles will vary by industry but they will typically be involved in day every-day management, particularly business strategy, business planning and monitoring business performance. The COO provides leadership, management and vision necessary to ensure that the firm has the proper operational controls, administrate and reporting procedures and people systems in place to effectively grow the organization and ensure financial strength and operating efficiency. The position accomplishes this through respectful, constructive and energetic communications styles guided by the objectives of the company.

Prior to his promotion, Mr. Rhodes led PWGC's Environmental Unit. There he utilized his 30 years' experience as an expert in managing environmental concerns unique to the real estate market, serving public and private sectors. Through his tenure he has provided guidance to associates and clients, maintains established working relationships with regulators at multiple levels of government. His expertise enables clear communication on project requirements and speeds the approval process.

Mr. Rhodes' expertise in environmental remediation and redevelopment fields includes environmental site assessments (ESA), such as Phase I/II ESAs, RI/FS, NYS Brownfield studies, NYC "E" Designation Program, and cost to cure estimates for real estate tax purposes. His experience with soil and groundwater investigations, air quality studies and remedial measures has benefitted clients that include attorneys and developers, insurance companies and municipal agencies. His resourcefulness to pinpoint key environmental concerns quickly helps avoid unexpected delays and cost overruns, benefitting the client.

NOTABLE PROJECTS

PWGC Environmental Real Estate Sector Services

Phase I & Phase II Environmental Site Assessment (ESA) Management – As Program Director for Property Transactions & Real Estate Environmental Management Services & Support for PWGC, Rhodes oversees Phase I & II ESA planning, implementation and completion. He ensures that each ESA is tailored to client needs and long-term goals. For each project, a targeted scope of work and relevant documentation is prepared for clients to allow them to make cost-effective business decisions. PWGC typically performs more than 60 Phase I & Phase II ESA's annually with clients that include attorneys, lending institutions and municipalities. Given his experience, Rhodes provides clients workable environmental solutions for real estate issues. Under his management, PWGC Phase I/II reports are recognized by peers and clients for effectively utilizing escrow agreements, environmental insurance and cost-to-cure estimates. Mr. Rhodes acts as the Project Director for these projects and is the main liaison with the SCDHS. As part of his duties, Mr. Rhodes participated in meetings with the New York State Department of Environmental Conservation and collaborated with SCDHS to streamline the brownfield restoration process.

Garvies' Point Redevelopment Project

RXR-Glen-Isle Partners, LLC – Mr. Rhodes has been acting as project director overseeing numerous environmental consulting programs for this major waterfront redevelopment project in the City of Glen Cove. PWGC was brought into the project to perform full spectrum environmental due diligence services for the waterfront area when RXR Realty, LLC entered into the project. The waterfront area includes sites in both the New York State and Federal Superfund programs - including the Li Tungsten and Captain's Cove sites - and the initial due diligence services, which focused on current remedial status and what needed to be completed in order for the redevelopment to proceed. Over the last several years, PWGC has been working closely with the development team including RXR-Glen-Isle Partners, LLC, the City of Glen Cove, regulatory agencies including the NYSDEC, NYSDOH, NCDH, and USEPA to move the project toward redevelopment. Towards this goal, PWGC continues to work with and coordinate services of other consultants to obtain the necessary information to allow the project to proceed. To accomplish this goal, PWGC has prepared numerous plans and reports including a work plan to address data gaps throughout the multiple parcels along the waterfront. The subsurface investigation performed under this plan included more than 200 soil borings to fully characterize the site to eliminate data gaps, which will allow the project to obtain environmental insurance. PWGC has been involved in all aspects of environmental consulting on this project as it readies for redevelopment including evaluation of site specific soil cleanup objectives, SWPPP preparation and oversight, petroleum remediation oversight, radiological monitoring plan preparation, MARSSIM survey support services, building demolition support services, geotechnical support services, TOGS sampling support services, waste characterization and disposal oversight, and dredge spoil characterization and handling. Project related documents prepared by PWGC include the Data Gap Workplan and Report, Visual Stained Petroleum Soil Remediation Report, Synthetic Precipitation Leachate Procedure (SPLP)/Red Flag Area Characterization Plan and Report. Li Tungsten Existing Condition Report and Captains Cove Existing Condition Report. PWGC continues to provide field oversight services for all aspect of the project, including health and safety and community air monitoring services.

Bellport Gas Station-Bellport, NY

Brownfield's Consulting Support Services – This Suffolk County Brownfields site is currently in the New York State Department of Environmental Conservation (NYSDEC) Environmental Restoration Program. Mr. Rhodes oversaw the preparation of a remedial investigation work plan and the Remedial Investigation/Alternative Analysis report. In addition, an Interim Remedial Measure was performed and a final Remedial Action Plan with NYSDEC was negotiated. He submitted a final site management plan with an environmental easement. The site has been remediated and PWGC continues to monitor the site as required.

Avalon Bay Communities - Rockville Center, NY

Brownfields Project Management -& Planning – As project director, Mr. Rhodes provided technical support and acted as a liaison between the New York State Department of Environmental Conservation (NYSDEC), the Village of Rockville Centre, the site's previous owner and new owner, Avalon Bay Communities. He was an advocate for Avalon Bay's needs and goals to redevelop the former industrial site as residential in meetings with NYSDEC and collaborated with the client and project team to develop the most effective strategy to streamline the project's representation with the state under the BCP program. Mr. Rhodes provided invaluable guidance in regard to the project's scope of work and documentation preparation, which included work plans, sampling and RI reporting. He was instrumental in obtaining all permits to complete the IRM work plan as well as throughout the performance of the IRM. The site then went to final remedial action work plan, design and oversight of final remediation, completion of site management plan and easement, which was first project of its type on Long Island to obtain COC and was a winner of ACEC Diamond Award for engineering excellence.

Expeditors c/o Cargo Ventures LLC - Inwood, NY

Environmental Site Assessment, Remediation, & Redevelopment – Mr. Rhodes supervised the investigation, remediation and redevelopment of a New York State Department of Environmental Conservation (NYSDEC) designated spill site on 4.25 acres at a former Shell Oil terminal located along Negro Bar Channel in Inwood, NY. As part of this multifaceted project,

Suffolk County Department of Health Services (SCDHS)

Brownfield Program Engineering Consulting Services Agreement – Through a competitive bidding process, PWGC was chosen by SCDHS as its engineering consultant related to County-owned Brownfield sites. Currently, PWGC is working on five sites for SCDHS in various stages of the Brownfield Cleanup Program (BCP). These sites are in both the municipal Environmental Restoration Program (ERP) and BCP in situations where the county assumed responsibility for the site. PWGC prepared a Phase I Environmental Site Assessment and documented historic environmental work performed at the site to satisfy requirements from associated lending institutions. Rhodes oversaw the completion of a subsurface investigation to determine site conditions to prepare appropriate NYSDEC-approved Corrective and Remedial Action Plans. Further, he oversaw the removal of petroleum-impacted soils, which resulted in an excavation measuring 60,000 square feet and more than 40,000 tons of impacted soils processed.

Benjamin Beechwood, LLC, Arverne Urban Renewal Area (URA) - Far Rockaway, NY

Consulting Services, Multi-Site Phase II Planning & Management – As project director, Mr. Rhodes collaborated with representatives from Benjamin Beechwood, LLC and served as liaison to the New York City Departments of Environmental Protection (NYCDEP) and Housing Preservation and Development (HPD) effectively advocating for their project goals. He supervised environmental due diligence for the development of the site – measuring 25 city blocks wide – and prepared the scope of work for a multi-site Phase II investigation. The result was incorporated into project documents along with work plans, health and safety plans, special area management, and submitted to NYCDEP and HPD. Once approved, Rhodes coordinated with NYCDEP on extensive geophysical and geo-probe investigations, test pits and soil pile characterizations. He directed the multi-faceted project, with tank removals and NYSDEC spill closures, successfully clearing the way for the area's redevelopment and revitalization.

Town of Babylon - Wyandanch, NY

Phase II Site Investigation & Redevelopment – Mr. Rhodes worked with the Town of Babylon's Community Development Agency and private interests, which resulted in the first new supermarket built in the hamlet of Wyandanch in more than 20 years. Rhodes developed a soil and groundwater investigation scope that revealed low tetrachloroethane (PCE) levels in the soil and higher levels in the groundwater generated by a dry cleaner formerly located at the site. Rhodes documented the PCE was degrading naturally and only low-impact levels were migrating off-site. To determine the off-site plumes' real and potential effect, PWGC conducted an extensive well survey down-gradient of the property to identify potential receptors of the off-site groundwater contamination. The results prompted the Town of Babylon to connect potentially affected residences to public water, safeguarding the contaminant pathway and clearing the site for redevelopment.

Groundwater Specialists, Inc. - Ronkonkoma, NY

QA/QC for Phase I & II Engineering Oversight Services – To assure quality of the remedial investigation, Mr. Rhodes reviewed the proposed work plan, analyses; progress and activities monitoring for the soil-boring program; monitoring well installation; groundwater sampling; and spot-checking of field records. He further reviewed the third party's data evaluation, risk assessment, draft report, and results' documentation to assure completeness and rationality; and assisted the client with the sealing of the final report upon approval.

Village of Lindenhurst – Lindenhurst, NY

Environmental Site Assessment for Property Redevelopment – Mr. Rhodes acted as liaison between Village of Lindenhurst officials and the Suffolk County Department of Health Services (SCDHS) representatives during the environmental assessment facet of a condemnation proceeding ordered by the Village as part of the site's proposed redevelopment into a court complex. Faced with access issues during the initial Phase I and II, PWGC collected enough evidence for SCDHS to obtain a court order for gaining entry to the property. Working in conjunction with the SCDHS, Mr. Rhodes finalized a scope of work and tasks, divided between PWGC and SCDHS personnel. Information collected in the joint venture documented the site's environmental integrity allowing for formulating the proper remedial action plan.

Krumenacker Florist and Nursery - Amityville, NY

Phase II Investigation & Site Remediation – After reviewing an existing Phase I report, Mr. Rhodes performed a Phase II investigation and site remediation to bring the facility into regulatory compliance and clear the path for future development. The Phase II strategy focused on specific areas of concern that could negatively affect the client in the form of greater expense and unexpected delays. The environmental concerns focused on an existing Class V Underground Injection Control Well, underground gasoline storage tanks, potential environmental assessment format issues and impacted soils beneath the former greenhouse. During the greenhouse demolition, Rhodes met with regulatory agencies to ensure that on-going soil sampling and health and safety measures met regulatory requirements.

New York City "E" Designation and Voluntary Cleanup Program (VCP)

In response to the rezoning activities in New York City, its Office of Environmental Remediation (NYCOER) oversees environmental investigation and remediation at suspect sites prior to redevelopment. Rhodes develops scopes of work for environmental investigation required to redevelop the "E" designated property. He oversees Phase I & II work plans, Health and Safety Plan and Construction Health and Safety Plan, which NYCOER must approve prior to the start of work. To assess the soil quality he coordinates and oversees subsurface investigations, including geophysical surveys and soil and groundwater sampling programs. Based on the findings, Rhodes develops and implements remedial strategies and prepares Remedial Action Plans for NYCOER approval. Rhodes provides technical oversight and support on vapor intrusion mitigation, such as vapor barriers and sub–slab depressurization systems, and is experienced with New York State Department of Health requirements on evaluating soil vapor intrusions.

Current NYCOER VCP projects Mr. Rhodes is overseeing include a nine-story affordable housing development for Phipps Houses and a 12-story residential complex in Harlem, NY for HAP Investment Developers, which also includes an affordable housing component.

Mr. Rhodes is also currently overseeing sites within the NYCOER "E" Program. He is working with Bizzi & Partners Development, LLC, in NYC's SoHo location, which will be redeveloped into a 25-story, mixed-use, high-end residential building. And in Long Island City, Mr. Rhodes is working with the Lightstone Group on the redevelopment of a former taxi site, which is being developed into a 10-story mixed-use facility.

Sive, Paget & Riesel, PC (SPR) - New York, NY

Expert Evaluation & Analysis, Carnegie Hill, New York, NY – The law firm of Sive, Paget & Riesel, PC contracted Rhodes to provide an environmental engineering evaluation to determine the source of petroleum contamination in a commercial corridor. A previous investigation conducted by the New York State Department of Environmental Conservation (NYSDEC) contractor identified SPR's client as the responsible party for an oil spill negatively affecting an adjacent building. He used the evaluation of previous reports, proper closure of a 10,000 gallon underground storage tank (UST), and cross match analysis of fuel oil to compare chemical fingerprints of several sources. PWGC prepared a comprehensive project document to illustrate hydrogeologic cross sections, a study of the bedrock, UST construction details, hydrographs and photos. The comprehensive document ultimately proved favorable for the client.

Baumann Bus site, Francis S. Gabreski Airport – Westhampton Beach, NY

UIC Investigation/Remediation – Through New York State's "Rebuild Now" Program, Mr. Rhodes oversaw the investigation/remediation for Underground Injection Control (UIC) sites on 58 acres at Suffolk County's Francis S. Grabreski Airport, a 1,500 acre former US Air Force base in Westhampton. A 2004 site investigation revealed elevated levels of semi-volatile organic compounds. Through analysis of historical maps and geophysical methods, a remedial work plan was prepared for the site to properly locate, characterize and close more than 100 UIC sites. Mr. Rhodes provided technical support to verify protocols

on local, state and federal levels, corresponded with the County to negotiate the scope of work, provided quality assurance and verified that all work was done in accordance associated guidelines permitting site redevelopment. PWGC's efforts included a supplemental remedial investigation, final remedial design and preparation of a site management plan and post remedial monitoring, which is allowing for the development of the Hampton Business District business park by Plainview, NY-based Rechler Equities.

In addition to be UIC work, Mr. Rhodes oversaw remediation efforts at Gabreski associated with the Suffolk County Department of Health Services Brownfield Program, which is administered by PWGC. Other projects successfully completed by Mr. Rhodes and PWGC, or nearing completion, under the Brownfield Program include the Blue Point Laundry site in Blue Point, the Canine Kennel at Gabreski Airport and the Ronkonkoma Wallpaper site in Ronkonkoma.

Jain Center of America - Lake Success, NY
Sub-Surface Investigation Review - Mr. Rhodes reviewed a subsurface investigation of a former gasoline station. While adhering to Village of Lake Success requirements to address past environmental problems at the site, he supported client efforts to obtain construction approval for the property. As part of the SEQRA review process, the Village required the client perform a subsurface investigation. After a review of Nassau County records, Mr. Rhodes discovered an open UIC file resulting from an acceptable endpoint result having not been obtained. He designed a subsurface investigation to address the UIC issue, the former gasoline spill, a sanitary system at the site, and other environmental concerns resulting in an expedited review process.

Penetrex Processing, Glenwood Landing - New York
Subsurface Investigation, NYS Class II Inactive Hazardous Waste Site – As project principal, Mr. Rhodes lead the investigation of an inactive hazardous waste site in accordance with a New York State Department of Environmental Conservation (NYSDEC)-approved work plan, which included sub-slab vapor and indoor air sampling and a sub-slab depressurization system. In addition, he oversaw the preparation of a feasibility study for the site that NYSDEC used to prepare a proposed remedial action plan, which lead to a Record of Decision.

Allstate Insurance Services - Hauppauge, NY
Spill Site Project Management – Mr. Rhodes oversees multiple residential fuel oil spills a year in New York City, Westchester, Nassau, and Suffolk Counties and Upstate New York on behalf of Allstate Insurance Services. He directs PWGC's Allstate team in providing technical oversight to document that spill remediation performed by the homeowner's contractor sufficiently addresses the contamination present and to achieve closure by the New York State Department of Environmental Conservation (NYSDEC). He ensures professional representation at all levels, and coordination with the NYSDEC and the environmental contractor. PWGC addresses all spills in a timely fashion, effectively reducing or eliminating Allstate's liability in such cases.

Sub-Surface Investigation Management & Client Representation Texaco Station, NY – Mr. Rhodes reviewed and supervised a sub-surface investigation to determine whether two underground storage tanks at a Texaco gas station were the potential source of soil and groundwater contamination under remediation at the time. He reviewed existing site data and supervised a subsurface investigation to determine the responsible party. The investigation showed the two storage tanks were not the source of contamination and that the current remediation system appeared ineffective.

Water Authority of Great Neck North - Great Neck NY
Groundwater Study – As project manager, Mr. Rhodes directed multiple studies using groundwater models in conjunction with the Nassau County Department of Public Works, to evaluate the pumpage of Great Neck's public water supply wells for potential for saltwater intrusion to determine the most favorable locations for a proposed well field. Rhodes used the results to prepare an aquifer management plan (AMP) for the authority that described short-term and long-term pumping scenarios. By following the AMP, the Authority has indicated the advancement of multiple saltwater wedges has slowed and/or ceased. He also prepared the water supply application and engineering report for the installation of new wells located off of the Great Neck Peninsula, which was part of the Authority's long term plans contained in the AMP.

John deCuevas, et al. v. East Hampton Golf Club, LLC, et al – East Hampton, NY
Expert Evaluation – Mr. Rhodes conducted an investigation to assess the potential environmental impact of a golf course development on the groundwater resource and to provide testimony on behalf of John DeCuevas. He researched and evaluated the hydrogeologic characteristic beneath the site, local groundwater quality concerns and potential chemical usage of the future golf course. The evaluation identified the potential for groundwater impact and the threat to nearby private drinking water wells from the proposed development. The findings prompted the two parties to agree on the development of a groundwater monitoring program to protect the private wells. Further, the golf course implemented an Integrated Pest Management program to control chemical use at the site. After developing the monitoring program that includes two wells required by Suffolk County Department of Health Services (SCDHS), Rhodes reviewed the data to determine if impacts had occurred and submitted his findings with SCDHS for incorporation in the county's database.

Fong and Wong, PC - New York, NY
New Best Cleaners & Tailors, Inc., Centereach, NY, Environmental Investigation & Remediation – He provided professional consulting services and expert testimony for the attorney who represented the site lessee in litigation with the property owner over the environmental condition and a lease buy-out agreement. He oversaw the soil and groundwater study to evaluate potential impacts and determine multiple sources of contamination, and remediation of sources associated with the dry cleaners, and participated in an on-site meeting with the presiding judge to demonstrate the conditions at the site first hand.

Minmilt Realty - East Farmingdale, NY

Remedial Project Management - As field manager, Mr. Rhodes coordinated a full remedial investigation and provided technical direction during the installation of a deep monitoring well - 180 feet - and defined the vertical extent of contamination and hydrophobic dyes to determine the movement of dense non-aqueous phase liquids (DNAPL) using groundwater quality screening. He prepared the RI/FS report and oversaw the operation and maintenance of the system.

Computer Circuits - Hauppauge, NY

Remedial Investigation and Feasibility Study (RI/FS) – Mr. Rhodes was a project director for a characterization of a contamination's nature and extent at the former Computer Circuits industrial site, a US Environmental Protection Agency Superfund Site. He coordinated the use of multiple geophysical techniques to determine if unknown buried objects such as drums, tanks, or leaching structures existed. Techniques employed during the course of the project were interior/exterior soil borings, multiple drilling/probe methods, EnCore™ sampler, to preserve VOC sample integrity, and off-site groundwater vertical profile sampling to depths in excess of 200 feet below grade. PWGC utilized an on-site laboratory grade gas chromatograph to screen both soil and groundwater samples and followed New York State Department of Environmental Conservation procedures during the investigation.

Brookhaven National Laboratory - Upton, NY

Major Cesspools Closure – Mr. Rhodes coordinated sampling efforts to comply with the EPA and States regulated UIC program for the closure. He monitored closely the full ASP-B protocol and, after analysis of laboratory data, submitted reports to the client.

Village of Sands Point, NY

Hydrogeologic Investigation – To assess the impact of proposed irrigation wells on the surrounding area, Mr. Rhodes determined the potential screen zones of the wells, considered potentially vulnerable to salt water intrusion. In addition, he assessed the impact on nearby public supply wells operated by the Village.

Paul K. Boyce, PE, PG • CEO/PRESIDENT

PROFESSIONAL EXPERIENCE
PWGC: 25 years

AREAS OF EXPERTISE
Water Resource/Supply Design
Civil Site Design
Remedial System Design
Geothermal Systems
Groundwater Hydrology
Groundwater Modeling

EDUCATION & TRAINING/CERTIFICATION
MS, Environmental Engineering, Polytechnic University, NY (now NYU)
BS, Civil Engineering, SUNY Buffalo, NY
Professional Engineer, NY, PA
New York State Professional Geologist
OSHA HAZWOPER 40-hr (29CRR 1910.120)

AFFILIATIONS
American Society of Civil Engineers (ASCE)
NYS Society of Professional Engineers
American Council of Engineering Companies (ACEC)
Long Island Professional Geologists Association
American Water Works Association (AWWA)
National Groundwater Association (NGWA)

PROFILE
An environmental engineering professional Mr. Boyce has amassed an impressive portfolio of successful project in the New York Metropolitan region. He is an expert at providing public and private clients with targeted analyses, designs, modeling services, investigations, master planning development, construction oversight, regulatory, and sustainability consulting.

For more than 25 years at PWGC, Mr. Boyce has been immersed in some of the most innovative and successful environmental engineering projects on Long Island, playing key roles in developments that have improved the region's economy and environment. Whether using cutting-edge geothermal technology to assist Amneal Pharmaceuticals in the development of its base of operations in Yaphank or conducting detailed groundwater modeling at Brookhaven National Laboratory, his client expertise covers a wide spectrum of applications including targeted design and analysis, groundwater modeling, environmental investigations, construction oversight, and sustainability consulting.

Overall, Mr. Boyce develops project-specific civil and environmental engineering designs, implementation strategies and project management plans. He is an expert on the design and construction oversight related to the application of geothermal technologies. He assists clients with selecting the appropriate system and location, feasibility assessment, design preparation, system development and startup.

In his tenure at PWGC, Mr. Boyce has earned an industry-recognized reputation for his ability to assess project parameters and design and developing economical environmental engineering solutions that meet the stringent demands of our clients.

NOTABLE PROJECTS

Mr. Boyce's responsibilities with regards to lead sampling and analysis include interpretation of regulatory requirements and federal action levels as they pertain to lead in potable systems, investigations into causes for high lead concentrations in drinking water, recommending solutions to remedy high lead levels, cost estimates for lead treatment strategies, designs for remedial solutions involving flushing, plumbing material replacements and chemical treatment and water chemistry modeling. He provided coordination and supervision of field teams performing lead sample collection. Mr. Boyce was the regulatory agency liaison for all parties involved.

NYC School Construction Authority (SCA)
Discolored Water Investigations and Remedies at Numerous Schools across New York City – Notable projects included: 229K, 163K, R062, Q316. Mr. Boyce's responsibilities included aiding STV and SCA in investigating causes, overseeing field investigation services, water quality sampling, metallurgy of pipe sections, water quality/chemistry analyses, recommending remedies, report preparation, oversight of remedy implementation and follow-up samplings.
Disinfection Oversight – Mr. Boyce's responsibilities included overseeing field teams who were responsible for witnessing disinfection of potable water systems at new or renovated school buildings.
Disinfection Specification Update – Mr. Boyce was responsible for updating the SCA's standard disinfection specification for potable water systems.
Brooklyn Army Terminal Pre-K Site – Incoming potable water into the leased space was experiencing bacteriological issues. Mr. Boyce was responsible for investigating the cause and designing a remedy which consisted of new piping system and filtration units.
Lead Sampling – Mr. Boyce served as a lead consultant to SCA for a major sampling program of all schools in the New York City school system. His responsibilities included assembling lead sampling teams, coordinating and scheduling sampling events with STV and SCA, coordinating with analytical laboratories, review sampling results and consulting with SCA regarding results and potential remedies.

Diocese of Rockville Center
Lead Sampling – Mr. Boyce was responsible for overall project management and coordination of sampling for lead in the potable drinking water systems at more than 25 Long Island Catholic schools in Nassau and Suffolk Counties. His responsibilities included coordinating field sampling teams, working directly with individual school staffs, reviewing lead results and recommending remedies. Once a remedy was implemented, Mr. Boyce oversaw follow-up sampling. Mr. Boyce is the primary point of contact for Senior Diocese management staff.

Northwell Health – Long Island Jewish Medical Center (LIJMC), New Hyde Park, NY
Environmental Policy & Procedures for the Prevention of Legionella Contamination
Mr. Boyce's responsibilities for this project included researching local, state, and federal legionella standards and guidelines and updating a pre-existing environmental policy and procedures manual for the prevention of legionella contamination in LIJMC healthcare facilities. Mr. Boyce coordinated with the New York State Health Department to determine the present status of legionella updates on the state level. Following extensive research on revisions undertaken to various guidelines and standards pertinent to legionella, Mr. Boyce updated the routine legionella sampling program, disinfection procedures, maintenance and long-term control measures to prevent legionellae contamination and the requirements for the development of a water safety management program.

Water Resource Management

Ross School, East Hampton, NY
Master Planning & Campus Design - Mr. Boyce provided civil engineering design services to develop a master plan for the private school campus, which was to be a "one of a kind," transforming the school into a state-of-the-art learning institution, situated in a rural, wooded groundwater recharge area.
Civil Engineering Services - Civil engineering and consulting were provided for grading, drainage, utility layout, roadways, parking, site lighting, athletic playing fields, irrigation, water supply, sanitary, wastewater collection, and open loop geothermal heating/cooling water systems. Throughout the project, Mr. Boyce collaborated with other project consultants, foremost planners, architects, landscape architects, MEP engineers, surveyors, contractors, the construction manager and the school administration. He oversaw and participated in the conceptualization and preliminary design of the campus' proposed layout, which included eco-friendly engineering designs consulting/development and integration of civil engineering design aspects with other important features such as academic programs, architecture, landscaping and pedestrian walkways.
Environmental Engineering Services - The campus was to be as green as possible utilizing available eco-friendly technologies for the most environmentally sensitive and appealing design. The campus' sensitive environmental location as well as sanitary density issues required a sewage treatment plant. Mr. Boyce investigated and evaluated different sewage treatment technologies capable to meet the school's projected needs functionally, aesthetically and academically. Mr. Boyce took into consideration some sustainability goals and follow regulatory requirements.
Environmental Consulting/Conceptual Design Services After researching the latest sewage treatment technologies, Mr. Boyce recommended to the master planning team and school administration a wastewater treatment system that naturally treats sewage and industrial waste to re-use quality that met the Master Plan goals: aesthetics, economic/environmental advantages and well below regulatory discharge standards. The panel accepted his recommendation and he created conceptualized layouts, sited for possible plant locations and designed a preliminary ecologically engineered sewage collection system.
Geothermal Well System Design – Mr. Boyce managed the site assessment, design, construction oversight and preparation of O&M manuals for the systems and conducted a feasibility study of using open-loop geothermal systems to heat and cool two of the school's most prominent buildings - The Center for Well Being (Bldg. 5) and the Media Pavilion (Bldg. 2). He researched local hydrogeological and groundwater quality conditions and analyzed the effects of required flow rates on a nearby Suffolk County Water Authority (SCWA) well field. Mr. Boyce employed Groundwater Vistas by ESI, to create a detailed 3-dimensional model for the area. His analysis illustrated the potential effects of supply and recharge wells on (1) each other, (2) nearby neighboring shallow wells, (3) the SCWA well field, and (4) the local water table (The model also took into account of the local groundwater divide). Once he had demonstrated that operating two separate open-loop geothermal well systems in close proximity would not have an impact, he prepared the engineering report for the NYS Department of Environmental Conservation, along with the appropriate Long Island Well permit applications for approval.

Northwell Health – Glen Cove Hospital, Glen Cove, NY

Northwell Health – Glen Cove Hospital, Glen Cove, NY, Geothermal Wells Project – As project manager, Mr. Boyce prepared the feasibility study, well permits, construction documents, oversaw the construction and fieldwork for the installation of a 400 GPM open-loop groundwater heat pump system. Before design, Mr. Boyce conducted the study to assess the feasibility of augmenting the AC's geothermal well system; he investigated size and location options for new wells and prepared construction cost estimates based on minimizing potential conflicts with existing site constraints and the likelihood of regulatory agency approval. He determined that expansion to the existing system would be feasible based on cost, local hydrogeology, and his modeling results. He advised the client that construction would cause significant disruptions to the hospital's daily operations. In accordance with NYSDEC guidelines, he investigated the potential effects of the proposed project on a nearby inactive hazardous waste site, obtained baseline water quality data, estimated aquifer characteristics to refine and calibrate the model and drafted a design and construction plan of a test and monitoring well to determine local geologic conditions. As liaison between NSUH, the NYSDEC, and the local regulatory agencies, Mr. Boyce established that a scaled-down, relocated system would have negligible effects on the hazardous waste site, and consequently, obtained approval for the proposed construction. NSUH selected Mr. Boyce to design, plan, and oversee the construction of the new system, which involved developing the design and strategy for a supply and recharge well system with inter-connecting process piping, detailed hydraulic analyses, sizing the various system components, and coordination with other project consultants on the installation of piping and process equipment.

Water Supply & Treatment

Suffolk County Department of Public Works, Yaphank, NY

Timber Point Country Club, Great River, Water Supply System & Irrigation Well Upgrades - Mr. Boyce directed the well's condition assessment, including pump test, to determine capacity and water quality and prepared specifications/plans to upgrade supply well with new pump and motor. Further, he designed new piping configurations to integrate an irrigation well with distribution and cross-connection to the Suffolk County Water Authority and specified new variable frequency drive for well pump motor.

West Sayville Golf Course, Sanitary System Improvements – Mr. Boyce oversaw construction phases through completion including, supervised design, development of permitting, bidding and administrative buildings sub-surface sanitary disposal system.

Peconic Dunes Park, Peconic, NY, Water Distribution System Improvements – Mr. Boyce supervised design/development of permitting, bidding, and construction documents to upgrade the existing water distribution system's components including backflow prevention devices water mains/meters, hydrants, and internal plumbing. Further, he oversaw construction phase services through to completion.

BOMARC Police Firing Range Westhampton, Drainage Improvements - Mr. Boyce directed design/development of permitting, bidding, and construction documents for drainage conditions improvements (i.e. stormwater collection/conveyance systems, new recharge system), and oversaw construction phase services through to completion.

Suffolk County Fire Academy, Yaphank, Water Supply Well Improvements - Mr. Boyce supervised design/development of bidding and construction documents for the re-circulated supply system. This included: physical/chemical rehabilitation, electrical service upgrades, a new motor starter, and replacement of a diesel driven booster pump with an electrically operated one, as well as the deep well vertical turbine pump and motor with a new submersible pumping unit. He managed construction phase services (administration, observation) to project completion.

SUNY Stony Brook, Sewer District 21, Groundwater Modeling Study, Stony Brook NY - Mr. Boyce performed a 3-d numerical groundwater modeling to estimate flow path and travel time of sewage treatment plant effluent from recharge basins to the Long Island Sound and prepared an engineering report documenting findings and modeling results.

Water Authority of Great Neck North, Nassau County, NY

Weybridge Road Clearwell Design - Mr. Boyce prepared a design for a new air stripper clearwell, upgraded the booster pump, piping, controls modifications, coordinated with NCDOH, and performed cost estimates. The design is completed and NCDOH has approved it, however, funding constraints have put the project on hold.

SCADA System Design - Mr. Boyce prepared a design for a new Supervisory Control and Data Acquisition System. He prepared bidding and construction documents, providing construction administration and observation services, and cost estimates.

Emergency Water Main Replacement, Berkshire Road - Mr. Boyce prepared design, construction and bidding documents for emergency water main replacements, expedited NCDOH review and approval, and provided PE certification services.

Air Stripper Cap at Watermill Lane – Mr. Boyce coordinated with contractor and WAGNN regarding design and sizing of appropriate air exit cap atop existing air stripper at Watermill Lane treatment plant.

Valve Book Review/Updates – Mr. Boyce updated valve location sketches as new valves are being installed in the distribution system.

Municipal Supply Well Design, Well #14 – Mr. Boyce oversaw the design services for the new 1,400 gpm municipal supply well. The design included an engineering report for NYSDEC and NCDOH review/approval, preparation of plans and specifications for a new well, associated piping, well house, electric, controls, instrumentation, chemical treatment, safeties, etc. Project is just underway as of Sept 2007. Construction phase services will also be provided.

Weybridge Road Ground Storage Tank Replacement – Mr. Boyce lead the project team charged with designing a new 500,000-gallon steel ground storage tank to replace a deteriorated and dilapidated existing 400,000-gallon ground storage tank. The team prepared bidding/construction documents, inclusive plans and specifications, obtained NCDOH approval, provided construction administration and oversight services.

General Consulting Services – Mr. Boyce attended Board of Directors meetings to present monthly engineering report, assist with hydrogeological issues, contaminant fate and transport concerns, well maintenance, water main rehabilitation, etc.

Hampton Bays Water District, Suffolk, NY

Well Field Construction & Integration – Mr. Boyce prepared the structural, mechanical, and electrical designs for a new well field including two pump stations. In addition to construction plans and specifications, Mr. Boyce oversaw the integration of a new well field with an existing distribution system via hydraulic analyses and guided the client through the regulatory agency review and approval process. In a subsequent project phase, he partook in creating the layout of several residential water main projects, for which he analyzed the proposed water main layouts and prepared conceptual designs based on Health Department and ISO requirements.

Caustic Feed Systems Design - Mr. Boyce was responsible for the design of caustic feed systems at all eight District supply wells. He prepared existing conditions drawings by conducting field visits to obtain the necessary information. He then designed caustic feed systems consisting of double-walled underground storage tanks, piping, metering pumps, safety interlocks, controls, alarms and injection equipment to raise the ambient pH of the groundwater withdrawn from the shallow aquifer system to between seven and eight and a half. He was responsible for preparing plans and specifications, obtaining Health Department approval, and then overseeing the construction administration and observation aspects of the project.

Isolated Pressure Zone Design - Mr. Boyce was responsible for designing an isolated pressure zone in an area that was experiencing chronic low-pressure conditions within the District's distribution system. He worked with existing distribution system maps and survey data to identify the boundaries of the proposed zone, he worked with available hydraulic data to estimate pressure conditions and developed a planned approach on how to isolate the zone and create a booster pumping station to raise pressures within the zone to acceptable levels. Mr. Boyce was responsible for preparing the project plans and specifications that included a new packaged booster pumping station, water main and valve work, electrical service and site work. The SCDHS approved the plans and the pressure zones were constructed closely to his design and construction cost estimate.

Good Samaritan Hospital, West Islip NY

Well Turbidity Study – After review of existing water quality data, Mr. Boyce recommended sampling and analyses for additional parameters. He applied a water quality model, using the existing raw water quality data. To achieve optimal water quality pH-level, hardness, and alkalinity, he performed trial and error solutions using a numerical model. Different treatment chemicals were included in the model in various combinations or by themselves. Concluding modeling efforts led to a realistic chemical concentration.

Copper & Lead Desktop Study – The results of the study Mr. Boyce performed served to identify the possible cases for turbid water condition and proposing alternative options for corrective actions to restore acceptable water quality. He presented each alternative for evaluation and comparison to determine most advantageous choice, based on potential for success, technical complexity, and cost. In addition, he prepared a treatment specification and coordinated with an experienced well driller, resulting in a successful chemical treatment, and restoration of the water quality to acceptable conditions.

Town of Oyster Bay, Syosset, NY

Potable Water Supply System Upgrade Design & Compliance Management Services – As Project Manager, Mr. Boyce coordinates inspection and assessment services for the town's Tobay Beach Park & Marina potable water supply system. PWGC focuses on the water supply system's status of compliance with NYSDOH, NCDOH, 10-State Standards, and provides feasible engineering designs to in response to the town's objectives: Safe, potable water for Tobay Beach patrons, in an economically sound fashion. Mr. Boyce managed the authoring of a feasibility report and selected/recommended minimum corrections and system upgrades. In addition, he prepared the design of a dry-briquette calcium hypochlorite chlorination system and other upgrades at Well House 3 of the Tobay Beach Park & Marina. To date, he continues to provide engineering services and design specifications for wellhead improvements. He also directs PWGC water quality monitoring and assessment services at the beach to determine compliance with local and state health department water quality and equipment guidance.

Civil Site

Three Mile Harbor Boat Yard, East Hampton, NY

Site Planning Analysis – After evaluating site conditions, Mr. Boyce recommended feasible improvements to enhance an existing boat yard facility. He investigated local zoning/building codes, sized/located sanitary facilities, sized/designed layout and arrangement of parking facilities, sized/located/orientated a new proposed structure to house a marine shop, offices, storage, and industrial space. He effectively addressed critical issues such as the site's location in a harbor protection area and no public water access, which put severe constraints on sizing and locating the sanitary facilities. He prepared plans and reports delineating suitable site alternatives and requirements for implementation in compliance with regulatory agencies and utility companies.

Inlet Seafood, East Hampton, NY

Site Plan Application - As senior engineer, Mr. Boyce designed and coordinated the preparation of site-plan application drawings for the commercial/industrial fishing marina looking to expand the site from a commercial to a multiple use area that included retail, restaurant, and commercial fishing. He managed civil/site concerns, which included grading, drainage, sanitary, water supply, utilities, parking, traffic controls, site lighting, and building locations/elevations. Mr. Boyce worked with the owners and other project consultants to conceptualize and plan the site layout for optimum use and compliance with local zoning and building codes. In addition, he prepared site-plan application drawings for the Town Planning Board and local regulatory

agencies. He supervised development of designs and bidding/construction documents for new water mains/services/flow meters, hydrants, and drinking water fountains. Mr. Boyce oversaw construction, and supervised wetlands delineation and permitting with the NYSDEC through to project completion.

Jay Construction Corp, NY
Pile Foundation Designs for Residential Homes - Mr. Boyce was responsible for designing foundations for four residential homes in Patchogue, New York. The design included investigating existing soil conditions, reviewing architectural plans, sizing piles based on soil conditions, locating piles based on architectural layout, determining number of piles based on loads including self-weight, building dead, live, snow and wind load, and worst-case combination of loads based on building code. He created designs for reinforced concrete pile caps in accordance with ACI requirements and created foundation walls to serve as grade beams between pile caps. In addition, Mr. Boyce prepared construction documents including plans and specifications and acted as the primary client contact throughout the project.

Times Square Construction, New York, NY
Geotechnical Report for 47 East 34th Street Building Construction – Mr. Boyce oversaw a rock core boring program, characterized rock core samples and developed a geotechnical report based upon findings of the rock core boring program. He provided foundation recommendations for a new 38 story residential building being erected upon Manhattan schist on the east side of midtown Manhattan. Mr. Boyce assisted with the rock anchor design and specification. He supervised and managed field observation services for rock anchor testing. Supervised and managed the September 2007 design and development of a foundation waterproofing system.

Storm Water Management

Benjamin Beechwood, LLC, Arverne Urban Renewal Area (URA), Far Rockaway, NY
Design/Engineering Management Services, Stormwater Collection & Conveyance System - Mr. Boyce managed the design and siting of a stormwater collection and conveyance system for an 80+ acre development along the south shore of Queens County. He coordinated catch basins locating, grading design, sizing interconnected piping networks and tie-ins with the local NYC storm sewer system. Mr. Boyce was also responsible for incorporating BMP's in the system design.
Stormwater Quality Impact Assessment on Local Surface Water Body - Mr. Boyce was responsible for determining stormwater roadway run-off concentrations for TPH's, suspended solids, metals, coli forms, pH, and dissolved oxygen. To estimate the influence of these parameters on the nearby canal basins into which they were to be discharged, he employed chemical and mathematical relations using chemical properties and mass balances based on flow rates and tidal flushing volumes to estimate potential effects. Subsequently, he assisted in preparing the stormwater portion section of a Draft Environmental Impact Statement.

NYSDOT, Kensico Reservoir Route, Westchester, NY
120 Expansion Stormwater Management System Stormwater Quality Pre-Construction Baseline Assessment – Mr. Boyce directed the roadway run-off sampling of 15 storm events and 5 outfalls along the Reservoir. He oversaw installation of automated sampling equipment to monitor weather conditions, sampling events, and system/statistical data analyses for a stormwater-runoff quality report.

Allied Aviation Services, LaGuardia Airport, NY
Storm water Sediment & pH Control Investigation, LaGuardia Airport, Queens, NY – Mr. Boyce was responsible for reviewing and investigating an ongoing problem of storm water discharge to a surface water body with a too high solids content level. Storm water runoff collected at the fuel tank farm for LGA is passed through a treatment system to remove oils and organic contaminants. Under severe rainfall events, the treated storm water effluent had been discharged to the adjacent harbor with unusually high amounts of suspended solids, which were temporary violations of the facility's State Pollutant Discharge Elimination System permit. To find a cost-effective solution for the continuing problem, he evaluated various alternatives from in line cartridge filters, to settling tanks, to storm drain separators. Aside from cost, he considered other restrictions, such as limited space for installation, maintenance, durability, and reliability. Mr. Boyce studied peak hydrologic events and recommended the most efficient and effective treatment option for the owner to implement. Elevated pH of the discharged treated storm water effluent presented an unexpected, and separate, water quality issue. In addition, he was responsible for investigating the cause of the problem and recommending a course of corrective action.

AIL Systems Inc, Deer Park, NY
Recharge Basin Size Analysis – To assess the feasibility of reclaiming land used for recharge purposes, to sell or alter its land use, Mr. Boyce analyzed the industrial facility's existing cooling water recharge system. His analysis included an investigation of the facility's hydrological and drainage characteristics, and the existing storm water handling facilities' capability to accommodate various storm events. Mr. Boyce reviewed local building codes to make sure any proposed alterations could handle the minimum required storm events. He investigated the cooling water discharge rates to the recharge basins, to determine how much of the existing basins were required to handle the cooling water. With his report, AIL Systems was able to effectively evaluate its real estate options.

Groundwater Remediation

Brookhaven National Laboratory, Upton, NY

Engineering Services for the Glass Holes & Animal Chemical Pits CERCLA Remedial Excavation - Mr. Boyce prepared the excavation plan and design drawings for a remedial excavation of over 50 individual waste pits at the client's site. He managed the waste pits' initial delineation, oversaw the geophysical survey using electromagnetic survey equipment, and prepared the excavation plan detailing technical guidelines for the hazardous waste site's remediation. The plan provided direction for the removal/recovery of organic, inorganic, biological and radioactive buried wastes, as well as explosive, reactive, and corrosive materials. His engineering drawings detailed excavation layout, work/stockpiling areas, grading, drainage, haul routes, utilities, and site restoration. He acted as a field engineer during the field operations, oversaw excavation/waste removal, stockpiling, characterization and segregation of excavated materials, and monitored daily logistics for field crews.

Mercury-Contaminated Soil Treatment Alternatives Evaluation Report - Mr. Boyce's report evaluated various appropriate remedial treatment technologies, including visual and technical system descriptions, a comparison study of each alternative's technology, treatment process efficiency in the types, quantities and concentrations of mercury present in the soil, as well as the overall economics and cost effectiveness. He called attention to the presence of other contaminants such as organics and radioactive parameters and studied the available technologies. He also presented recommendations for a soil stabilization process and options for the remediated soil's disposal.

OUIII Western South Boundary Remedial System Design - Mr. Boyce was responsible for assisting in selecting the appropriate remedial technology for a groundwater pump treatment system for a volatile organic contaminant plume clean up. He suggested appropriate technologies and reviewed them from a feasibility standpoint. He recommended the most applicable one, based on effectiveness, available capital and O&M costs, implementation, reliability, operation, and maintenance. Mr. Boyce was then responsible for preparing a portion of the design of the recommended treatment technology, which included sizing and optimizing the primary treatment equipment (4-foot diameter x 35-foot tall air stripping tower).

Ash Pits Capping –Mr. Boyce was responsible for preparing the design of a capping system for an area formerly used as incinerator ash repository. He conducted the initial investigation to assess the area's extent by reviewing old aerial photographs, digging test pits, and conducting interviews with BNL personnel. Once he had delineated and surveyed the area, Mr. Boyce designed a soil-cap cover system in accordance with NYSDEC regulations to prevent surface exposure to ash and to minimize rainfall infiltration through the area. He was responsible for repairing design/construction drawings that included grading, drainage, slope stabilization details, limits of clearing and coverage and site restoration work such as fencing, roadways, signage, etc.

Minmilt Realty, Farmingdale NY

Groundwater & Soil Remediation Systems Design - Mr. Boyce evaluated, selected and designed appropriate remediation systems to cleanup a large industrial solvent plume that had contaminated nearby soil and groundwater. The chosen groundwater remediation consisted of an air-stripping tower, granular activated carbon (GAC) filters for off gas treatment and recharge structures; the soil treatment system was a soil-vapor extraction system (SVE) and GAC filters. Mr. Boyce's design responsibilities included sizing and selecting remediation system equipment, structural, mechanical, electrical, hydraulic, well, controls and instrumentation design. Mr. Boyce also performed three-dimensional numerical groundwater modeling to evaluate the effectiveness of the proposed groundwater remediation system and to size and locate a series of deep and shallow wells. Mr. Boyce prepared plans and specifications, a technical report for the NYSDEC detailing the choice of the specific components overall design process. He was involved in the construction administration and oversight of the remediation systems and was responsible for reviewing and approving shop drawings and performing routine construction observation services.

Brentwood Water District (BWD) Air Stripper, Plant No. 2, Brentwood, NY

Treatment Alternatives Study & System Design – As Project Engineer, Mr. Boyce conducted the treatment alternatives study for a VOC contaminated well field at BWD. The study ultimately recommended air stripping as the most effective and cost efficient technology to treat groundwater withdrawn from Plant No. 2. Upon the study's completion and acceptance, he prepared the design for the treatment system, which encompassed mechanical, electrical, structural, hydraulic, architectural and site components. Specific design components included an 11′ diameter by 30′ packed bed depth aluminum air stripper, a 100,000-gallon ground storage clearwell, and booster pumps. Specific design aspects include restaging an existing well pump, electrical service upgrade, a new natural gas engine generator set, stripping tower enclosure and three existing pumping stations refinish. Mr. Boyce prepared the plans and specifications, which were approved by the SCDHS and ultimately used to construct the air stripper and related facilities. Following the design phase of the project Mr. Boyce was responsible for providing construction administration and observation services.

Nitrate Study & Analysis - Mr. Boyce prepared a statistical analysis to compare increasing groundwater nitrate concentrations with pumpage from Plant No. 2 of the BWD. The analysis involved compiling water quality data to measure levels in three wells of Plant No. 2, reviewing the data, and using statistical methods to forecast the water quality of pumpage from the aquifers utilized by the BWD. He superimposed pumpage data from Plant No. 2 over his water quality findings to create a trend analysis, which showed nitrate concentrations fluctuated in the different wells based on pumpage. Mr. Boyce recommended available treatment technologies which eventually would be necessary to slow the deterioration rate of water quality caused by nitrate level changes. He advised that, based on the statistical analysis, establishing pumping sequences would slow the rate of water quality deterioration. His report also included estimates for when treatment of nitrate will become necessary and appropriate treatment technologies available.

Roanoke Sand & Gravel, Mid Island, NY
Sand Mining Design and Permitting – As the primary client contact, Mr. Boyce oversaw the application submittal to the Town of Brookhaven and NYSDEC to expand mining operations at an existing sand and gravel mine. The scope of services included assembling engineering drawings for proposed mining operations by excavating deeper through the bottom; preparing an engineering report addressing environmental, geotechnical and hydrogeological issues; preparing volume estimates to determine how much more sand and gravel could be mined by expanding the operations at the existing site and acting as regulatory liaison for the client.

PUBLICATIONS

- Not Just a Chemical Interaction: Complementary Roles of Geologist & Engineer on a Hazardous Waste Remediation Project at BNL (5th Conference: Metropolitan & Long Island Association of Prof'l Geologists (M/LIPAG, 04/98, SUNY Stony Brook)
- Much Ado About Mercury: Evaluation of Treatment Options for Mercury Contaminated Soil at Brookhaven Nat'l Laboratory (BNL) (6th Conference, M/LIPAG, 04/99, SUNY Stony Brook)
- Open-Loop Geothermal Well Systems on Long Island (10th Conference, M/LIPAG, 04/03, SUNY Stony Brook)

Andrew Lockwood, PG, LEP •

SR. VICE PRESIDENT

PROFESSIONAL EXPERIENCE

PWGC: 13 years

PRIOR: 17 years

AREAS OF EXPERTISE

Phase I and Phase II Environmental Site Assessments
PFAS and other emerging contaminants
Petroleum Spill site investigation/remediation
CERCLA sites
NYSDEC Brownfield Cleanup Program/Environmental Restoration Program
Environmental/Regulatory Compliance (Investigation/Remediation Mgmt)
Radiological Characterization & Remediation
Chemical, Radiological/Mixed Waste Management & Disposal
Groundwater Treatment System (Planning, Design, O&M)
Client Representation & Regulatory Liaison
Environmental Program Mgmt (Planning, Monitoring, Safety)

EDUCATION & TRAINING/CERTIFICATION

BA Geology, SUNY Potsdam, NY
Licensed Professional Geologist - NYS
Licensed Environmental Professional (LEP), State of Connecticut
"D&D of Research Reactors & Other Small Nuclear Facilities" Certificate (Argonne Nat'l Laboratory, 11/2001)
DOE Radiological Worker I & III
OSHA Health & Safety 40-hr, Supervision 8-hr
30-hr OSHA Construction Safety Training,2009
Advanced Radioactive Material Shipper Certification Training, 2004
Advanced Hazardous Waste Shipper Certification Training, 2004
ISOCS Measurements Using the Inspector, Canberra Industries, Inc, 1999
Groundwater Pollution & Hydrogeology, Princeton University, 1990
Project Leadership Course, PCI Global Inc., 2001

PROFILE

Mr. Lockwood specializes in planning and managing CERCLA/NYSDEC remedial investigations/Feasibility Studies, Phase I and Phase II ESAs, Brownfields Cleanup Program (BCP) projects, nuclear facility decontamination & decommissioning (D&D), waste management, and disposal. He has worked at numerous DOE and DOD facilities and more than a dozen states across the country managing radiological, hazardous and mixed wastes investigation/remediation projects. These include multi-million-dollar, multi-year projects that involved complex investigations, remediation and waste management issues. Mr. Lockwood manages PWGCs environmental group, overseeing a staff of more than 30 professionals.

Mr. Lockwood has over 30 years of experience managing environmental investigation and remediation projects including CERCLA RI/FS sites, NYSDEC BCP sites, NYCDEP "E" sites, Municipal Landfill permitting and closure, and environmental investigations for real estate transactions. Mr. Lockwood's clients range from large governmental agencies to small real estate developers. He has performed work across the eastern United States under numerous federal, state, and local regulatory agencies.

NOTABLE PROJECTS

Project Manager, Youngs Avenue Landfill Groundwater Monitoring, Riverhead, NY

Managed activities for the groundwater monitoring associated with the closure of the Youngs Avenue Landfill in Riverhead, NY. The project involved quarterly groundwater monitoring of the existing monitoring well network and preparation of a quarterly groundwater monitoring report.

Project Manager, Landfill Extension, Bradley County, Cleveland, TN
Managed activities for the hydrogeologic investigation conducted at a 26-acre municipal landfill extension in Bradley County, TN. Supervised the installation of soil borings and a groundwater monitoring network and conducted soil and groundwater sampling activities. Served as primary author of the hydrogeologic report.

Project Manager, Landfill Closure, Barton, NY
Managed activities for the hydrogeologic investigation conducted at a municipal landfill in the Town of Barton. The landfill had also received large quantities of industrial wastes. Supervised the installation of a groundwater monitoring network and conducted soil and groundwater sampling activities. Groundwater was analyzed for volatile organic compounds, metals, phenols, chlorinated organics, and baseline water quality parameters. Served as primary author of the hydrogeologic report.

Project Manager, Landfill Permitting, Campbell, NY
Managed a hydrogeological investigation for the permitting of an 80 acre construction and demolition debris landfill. Designed and supervised the installation of the groundwater monitoring network at the site. Prepared the hydrogeological report for submission to the NYSDEC and was the primary contact for negotiations with the state.

Suffolk County Fire Training Facility - Yaphank, NY—RI/FS
Mr. Lockwood manages the ongoing RI/FS for the Suffolk County fire training facility in Yaphank, NY. The 28-acre site is in the NYSDEC's inactive hazardous waste site program. The site was listed as a NYS Class 2 Inactive Hazardous Waste Disposal Site in August 2017. The primary contaminants of concern are in a class of chemicals referred to as per and poly fluoroalkyl substances (PFAS). The specific PFAS of interest are primarily perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). The presence of these compounds is the result of the use of the Aqueous Film Forming Foam (AFFF) at the site. Mr. Lockwood was responsible for the preparation of the Citizens Participation Plan, Records Search Report, RI Work Plan, Quality Assurance Project Plan and Health and Safety Plan. The RI field work included delineation of PFAS in soil on-site and in groundwater both on and off site. In addition, site specific protection of groundwater soil cleanup objectives were calculated (no soil cleanup standards are available in NYS). PWGC is currently preparing a feasibility study with alternatives to address both soil and groundwater contamination at the site.

Wertheim National Wildlife Refuge - Shirley, NY—POET System Design and O&M
Three Point of Entry Treatment (POET) Systems were designed and installed at the refuge, one in a maintenance garage and two in residential buildings located within the refuge. The POET Systems were designed to remove per and poly fluoroalkyl substances (PFAS) that were detected in the groundwater supply wells servicing the three structures. Mr. Lockwood was responsible for the preparation of an Engineering Report and Operations and Maintenance Manuals for the systems. PWGC oversaw the installation and start up testing of the systems and is performing the scheduled system sampling to ensure that the systems are functioning as designed.

Carmans River - Shirley, NY—Surface Water and Biota Monitoring
Mr. Lockwood managed the investigation of per and poly fluoroalkyl substances (PFAS) in surface water and biota within the Carmans River and other water bodies within Suffolk County. Mr. Lockwood prepared a Biota Monitoring Work Plan/QAPP that included the collection of surface water and biota samples (eels, blue crabs, white perch, and clams) for PFAS analysis. He prepared a Biota Monitoring Report detailing the results of the investigation

Gabreski Airport – Westhampton Beach, NY
Mr. Lockwood managed a field investigation to investigate the presence of per and poly fluoroalkyl substances (PFAS) in groundwater discovered during routine O&M monitoring of a NYSDEC BCP site. Vertical profile wells were installed upgradient and downgradient of the site. The Investigation is ongoing.

Brookhaven National Laboratory - Upton, NY
Mr. Lockwood served over 10 years as Project Manager on various CERCLA projects for BNL Environmental Restoration Division (ERD). He has managed diverse projects for BNL's Groundwater, Surface, and Reactor Groups. On his most recent projects for the Reactor Group, Mr. Lockwood provided project management services on four remediation projects over a 3-year period with budgets totaling more than 15 million dollars. In addition, he has prepared or assisted in the preparation of site-specific project documents such as work plans, sampling and analysis plans, quality assurance project plans, health and safety plans, records of decision (ROD), completion reports, final status surveys, remedial investigations (RI) and feasibility studies (FS). He has prepared contract documents, including request for proposals (RFP's), scopes of work (SOWs), and contract specifications for both large- and small-scale procurements and has acted as the technical representative on multiple contracts, ensuring the contract scope is being completed.

Mr. Lockwood combines his technical background with his in-depth knowledge of BNL's protocols and procedures to prepare schedules and cost estimates for baseline and fiscal year budgeting and tracking, provide short-term assistance to help BNL complete Baseline Change Proposals, and long-term assistance to manage remedial projects.

Project Manager- Fan Houses and Stack Silencer D&D, Underground Utilities Removal, Perimeter Area Soil Remediation Projects – Mr. Lockwood managed multiple remediation projects at BNL between 2008 and 2011. Project involved overseeing demolition of radiologically contaminated above ground and below ground structures, preparation of project documents including Remedial Action Work Plans, Sampling and Analysis Plans, and Completion Reports.

The projects involved the disposition of complex waste streams. He was the primary interface with regulatory agencies and DOE. Mr. Lockwood was responsible for completing the projects on schedule and within the allocated budget. All projects were successfully completed.

Project Manager - Chemical Holes Remediation Project - Mr. Lockwood was involved with the Chemical Holes project since 1995. He served as the project Field Engineer performing and/or overseeing the characterization of the site including soil and groundwater sampling as well as geophysical surveys using EM-51, EM-61, Rapid Geophysical Surveyor (RGS) and multiple GPR surveys to locate the 55 individual waste pits. Pilot Testing for selected remedies was conducted and included in-situ vitrification, excavation, and containment using cement/polymer injection. He participated in the selected remedy, large-scale excavation and disposal, overseeing excavations of the waste pits at the site. He served as the Project Manager for the post-excavation characterization and disposal, wastes generated included mixed, waste, cylinders, liquid mixed waste, and mixed waste soil (mercury). More than 15,000 yd3 of waste was successfully transported for disposal and the site released with no radiological controls, he was responsible for the characterization, management, treatment, transport, and disposal of complex waste streams.

Project Manager - Former Hazardous Waste Management Facility Project - Utilizing his knowledge of chemical and radiological characterization, CERCLA, and DOE procedures and protocols, Mr. Lockwood managed the characterization, and implementation, of a remedial design at a 12-acre site formerly used as the primary facility for the storage, treatment, and packaging of hazardous, radioactive, and mixed waste at BNL. His responsibilities included the development of project plans, project scope and detailed schedule, resource needs and budget estimates. The project involved the characterization of buildings with both hazardous and radiological contamination, their D&D and transport and disposal to permitted facilities. In addition, characterization of the 12-acre facility was performed which included soil, groundwater and sediment sampling, at NYS delineated wetland located within the facility, for chemical and radiological contamination. A remedial design was prepared which included the excavation of approximately 11,000 yd3 of radiologically contaminated soil and sediment and the restoration of the site. As project manager, Mr. Lockwood was responsible for the daily management of this project including preparation of contract specifications, procurement documents and budget forecasting and management. He was responsible for the preparation or approval of all project documents from characterization, contracting, through implementation of the remedial action. Mr. Lockwood coordinated the successful completion of the project tasks overseeing subcontractors and support from other BNL divisions.

Project Engineer OU III Strontium-90 Pilot Study Design – Mr. Lockwood prepared a Pre-Design Characterization Work Plan to support the preparation of a Pilot Study Design for the remediation of Strontium-90 (sr-90) contaminated groundwater at BNL. Groundwater south of the former Chemical/Animal Pits had been impacted with sr-90 at concentrations exceeding NYSDEC groundwater standards. The purpose of the investigation was to delineate the concentrations within and extent of the sr-90 plume. Mr. Lockwood implemented the plan, prepared the Pre-Design Characterization Report, and participated in the successful completion of the Pilot Study, which led to the installation of a permanent remedy using resin vessels to remove sr-90 from the groundwater.

Special Projects Manager BNL Waste Management Facility - Mr. Lockwood provided technical services support to the BNL Environmental and Waste Management Services Division. His responsibilities included project planning and implementation of the characterization, packaging, and disposal unknown radioactive sources (including TRU Waste). Mr. Lockwood prepared technical work documents (TWDs) for the D&D of radiologically contaminated equipment including the Building 801 D-Tanks Pipe Removal project and the Building 865 Compactor Repair. He also prepared TWDs for the sampling of low level radioactive liquid wastes in the Bldg. 810/811 storage tanks. Mr. Lockwood prepared maintenance procedures for the facilities infrastructure. Mr. Lockwood prepared and implemented a TWD for the Central Steam Plant Outfall Soil Excavation, Transportation, and Disposal, including preparation of sampling plans, delineation of lead impacted soils, review of contractor deliverables and oversight of the excavation and performance of confirmatory sampling and reporting.

Field Engineer Brookhaven Linear Isotope Producer (BLIP) Investigation - The BLIP facility is used for the production of radio-isotopes used in the medical field. Targets are introduced into the beam line produced by a linear accelerator. The facility was constructed with an earthen beam stop. Mr. Lockwood participated in the preparation of a work plan to characterize the nature and extent of soil and groundwater contamination associated with the operation of the facility. Sodium-22 and tritium were identified as the primary contaminants of concern. The extent of the radiological contaminants was identified and a report detailing the results of the investigation prepared.

Field Engineer OU I Western South Boundary Groundwater Remediation System Design - Mr. Lockwood oversaw the implementation of the Characterization Work Plan installing temporary and permanent groundwater monitoring well points to delineate the extent of contamination within the Western South Boundary groundwater contamination plume at the BNL site. Mr. Lockwood oversaw the preparation of the Remedial Design Documents and construction of the groundwater treatment system identified in the design.

Field Engineer Magothy Characterization Project - Mr. Lockwood oversaw the implementation of the Characterization Work Plan installing temporary and permanent groundwater monitoring well points to delineate the extent of contamination within the Magothy aquifer beneath the BNL site.

Brownfield Cleanup (BCP)/Environmental Restoration Program (ERP)

Mr. Lockwood manages BCP and ERP projects for both private and municipal clients. He prepares applications, technical documents, and interfaces with NYSDEC project managers to ensure project schedule and scope meet NYSDEC's requirements for approval of incentives/reimbursements. These sites require preparation of BCP and ERP applications, technical work plans, RI reports, human health and ecological assessments, remedial alternatives reports (FS), citizens participation plans, public meetings and completion reports. Under contract with the Suffolk County department of Health Services (SCDHS) and

the Department of Public Works (DPW), Mr. Lockwood assists the County in managing the technical aspects of County owned sites in the NYSDEC Brownfields Cleanup and Environmental Restoration Programs. These sites include former United State Air Force Disposal Sites and former industrial and gasoline service station sites which are currently vacant or unused because the redevelopment of the sites are hampered by historical site uses which have contaminated soil and groundwater.

New York City "E" Designation Sites

In response to the recent rezoning activities in NYC the NYC Department of Environmental Protection (NYCDEP) oversees environmental investigation and remediation at suspect sites prior to redevelopment. Mr. Lockwood develops scopes of work for environmental investigation required to redevelop the "E" designated property. He prepares work plans and HASP reports; which DEP must approve prior to the start of work. To assess the soil quality, he coordinates and oversees subsurface investigations (including geophysical surveys and soil and groundwater sampling programs). Based on the findings he develops and implements remedial strategies and prepares Remedial Action Plans for NYCDEP approval.

Phase I & Phase II Environmental Site Assessment (ESA)

Project Management – Mr. Lockwood managed Phase I & II ESA's preparation, implementation, and completion. Mr. Lockwood performs these services for a variety of clients including banks, developers and municipalities. For each project, he provides a customized scope of work and relevant documentation to provide clients with pertinent information. He performs Phase I & Phase II ESA's for private clients, environmental attorneys, municipalities, and lending institutions for use in property transactions according to ASTM Standards.

Lowe's Home Center

Mr. Lockwood manages Phase II environmental investigations and remediation for Lowe's Home Centers. Mr. Lockwood is one of a team of consultants who manages site development activities at properties identified by Lowe's as potential development sites. These sites include previously developed sites with past commercial and industrial, including one used as a Municipal Solid Waste Landfill. Each site has a unique environmental issues and regulatory involvement. Mr. Lockwood prepares environmental reports, engineering designs and conducts remedial activities to support redevelopment of the sites.

GTJ-Group/Green Bus Lines, Inc - Queens/Brooklyn, NY

Hydrogeology/Environmental/Civil Engineering Services & Compliance Stipulation Agreement –– Services range from Site Remediation Management & Baseline Environmental Report Preparation (Project Coordination, Oversight, Sample Collection) at large bus facilities.
Mr. Lockwood conducted site/facility investigations and provided, on an accelerated time schedule, site investigations and remedial action planning and design for dissolved and free phase groundwater contamination treatment systems.

NYSDEC Spill Program Compliance - In 2005, an Oil Delivery Company had caused a substantial Oil Spill at one of the client's depots; the new release brought attention to outstanding issues required under an existing Stipulation Agreement, although Cleanup tasks were in compliance. The NYSDEC issued a new Order of Consent, with an accelerated time schedule. Under Mr. Lockwood direction, the PWGC team completed an accelerated Site Assessment (delineating the extent of LNAPL and dissolved contamination at the site) and submitted a Remedial Action Plan and preliminary treatment system design to meet the accelerated schedule. Mr. Lockwood managed PWGC construction oversight of the selected remedy and performed operation/maintenance of the remedial system.

PA, City Industries Superfund Site - Winter Park, FL.

Mr. Lockwood managed the preparation of work plans, health and safety plans, project schedule, and budget estimate. He coordinated and supervised soil boring/monitoring well installations and soil and groundwater sampling activities. Analyses were conducted for volatile organics, semi-volatile organics, and chlorinated compounds. Mr. Lockwood served as the primary author of the PA report.

Department of Transportation Facilities - Nashville, TN.

Managed RIs and prepared RI reports and CAPs at several Department of Transportation facilities in Tennessee. Investigations included preparation of work plans, installation of boring and monitoring well networks, and preparation of an RI report. The CAPs included the performance of aquifer pumping tests. The RI report contained options for recovery and treatment of soil and groundwater contamination with dissolved and free phase petroleum compounds. Mr. Lockwood served as primary author of the RI reports and CAP.

Loring AFB Operable Unit 5 RI - Caribou, ME

Field Team Leader for the RI Investigation, Loring AFB – The field effort extended over six months and included the complete investigation of three separate sites. Field activities included the installation of Geoprobes® (250), soil borings (50), and monitoring wells (25) including three multiport Westbay wells; and groundwater, stormwater, and sediment sampling. Mr. Lockwood's responsibilities included preparation of Statements of Work, client interface, and RI report preparation.

Thomas Melia, PG • SR. PROJECT MANAGER

PROFESSIONAL EXPERIENCE

PWGC: 14 years

PRIOR: 2 years

AREAS OF EXPERTISE

Phase I & II Environmental Site Assessments
NYSDEC Brownfield Cleanup Program Management
NYCOER Brownfield & E Designation Management
Remedial Activities
Site Investigation/Analysis, Work Plan/Report Preparation
Environmental Compliance & Investigation
Soil/Groundwater Investigations, Analysis, Sampling (Manual; Mud Rotary/Hollow Stem Auger, Direct Push Technology, Roto-Sonic Drilling Techniques)
UST Remediation
Hazardous Waste Site Investigation/Cleanup

EDUCATION & TRAINING/CERTIFICATION

MS, Energy & Environmental Systems, Stony Brook University, NY
BS, Geology, Stony Brook University, NY
AS, Earth/Space Sciences, Suffolk Community College, NY
ASTM Phase I ESA Practices for Commercial Real Estate: Transaction Screen & Phase I Site Assessment
Licensed Professional Geologist, NYS
OSHA 40-Hour HAZWOPER
OSHA 8-Hour HAZWOPER Supervisor

PROFILE

As a Senior Project Manager, Mr. Melia has assisted property buyers, sellers and developers navigate potential environmental concerns, petroleum spills, the NYS Brownfield Cleanup Program, the NYC E-Designation Program/Voluntary Cleanup Program requirements during property transactions and site development. PWGC's role on these projects has included soil/groundwater investigations, air quality studies, and remedial measures. His clients, ranging from developers to attorneys, and municipal agencies, benefit from his expertise in overseeing Phase I and II ESAs, Remedial Investigation/Feasibility Studies, cost to cure estimates for financial institutions, and Brownfields projects. Mr. Melia coordinates with PWGC clients to prepare plans for approval by federal, state, and local agencies (e.g., Remedial Action Plans, Health and Safety Plans, Investigation Work Plans, Interim Remedial Measures) and monitors each project's day-to-day progress to meet the client's objectives and regulatory requirements on time and within budget.

NOTABLE PROJECTS

Phase I & Phase II Environmental Site Assessment (ESA)

Mr. Melia manages Phase I & II ESA preparation, implementation, and completion. For each project, he provides a customized scope of work and relevant documentation to provide clients with pertinent information. He performs Phase I & Phase II ESAs for private clients, environmental attorneys, municipalities, and lending institutions for use in property transactions according to ASTM Standards.

AvalonBay Communities, Inc. - Former Darby Drug Facility, Rockville Centre, NY

NYSDEC Brownfield Cleanup Program Implementation During Redevelopment – The Former Darby Drugs Distribution Center was a commercial warehouse formerly occupied by a textile company which was a source of PCE contamination to soil and groundwater beneath the site. The site was enrolled in the NYSDEC Brownfield Cleanup Program (BCP). Mr. Melia developed a scope of work for a Supplemental RI at the site, which included a Supplemental RI Work Plan, Health and Safety Plan, and Community Air Monitoring Plan. The Supplemental RI included soil sampling to delineate the suspected PCE source area, soil and groundwater sampling above the clay lens to evaluate general soil and groundwater quality above the clay lens, and vertical profile sampling to evaluate groundwater quality beneath the clay lens, and evaluation of soil vapor/indoor air quality. Following preparation of the Supplemental RI Work Plan, Mr. Melia acted as the Field Team Lead to oversee junior staff implementing the work plan, to ensure that data generated during the Supplemental RI was sufficient to develop a remedial plan for the site. Following completion of Supplemental RI field activities, Mr. Melia prepared a Supplemental RI Report. The report detailed the horizontal and vertical extent of contamination beneath the site in multiple media, and an evaluation of the fate and transport of the contamination. The report was utilized to support the preparation of an Interim Remedial Measure, and the Remedial Action Work Plan.

Suffolk County Department of Health Services – Former Canine Kennel Site, Gabreski Airport, Westhampton Beach, NY

NYSDEC Brownfield Cleanup Program Implementation – The Former Canine Kennel Site is a New York State BCP site which consists of a portion of Francis S. Gabreski Airport in Westhampton, New York, a former US Air Force base that was given to Suffolk County. During US Air Force deactivation prior to transferring the property to Suffolk County, the Former Canine Kennel Area was used for the disposal of PCB containing electrical distribution equipment such as transformers and capacitors. Based on a previously completed RI for the site, Mr. Melia prepared a Remedial Action Work Plan (RAWP) and Alternatives Analysis (AA) for the site to address PCB contamination beneath the site. The AA evaluated several potential remedies for the site. The RAWP selected and detailed the preferred remedy for the site which included the targeted removal of PCB impacted soils from the areas with the highest PCB concentrations to meet site-specific Soil Cleanup Objectives (SCOs), capping of low level surfical PCB impact, and evaluation of PCB impact in groundwater. In addition to the RAWP, a Self-Implementing Cleanup Plan for PCBs was prepared and submitted to USEPA to allow for PCB impacted soils below a certain threshold to be disposed of as non-TSCA waste. Following NYSDEC approval of the RAWP and AA, Mr. Melia was responsible for managing all remedial work performed at the site, which included the removal of over 1,000 tons of PCB impacted soil and debris, collection of over 200 confirmatory endpoint samples, installation of a one-foot cap of clean fill material, and collection of groundwater samples from the site. Following completion of remedial activities, Mr. Melia prepared a draft Final Engineering Report (FER), which documents soil remediation, and evaluates PCB impact and migration in groundwater, and draft Site Management Plan (SMP), which details the operation and maintenance of engineering controls and institutional controls implemented at the site, and specifies a proposed scope of work for long term monitoring and/or remediation of PCB impacted groundwater at the site. The draft FER and SMP are currently awaiting approval by NYSDEC.

PFAS Investigation – Following completion of remedial activities at the Former Canine Kennel Site, per and poly fluoroalkyl substances (PFAS) was detected in groundwater during routine O&M monitoring. Following this discovery, Mr. Melia managed a subsurface investigation at the site to horizontally and vertically delineate the extent of PFAS impact at the site. The investigation consisted of the installation and sampling of groundwater vertical profiles to 100 feet below grade both on and off site. The results of the investigation showed that the source of PFAS impact was upgradient of the Former Canine Kennel Site and that PFAS impact extended to at least 100 feet below grade.

Phipps Houses - Phipps Plaza South, Manhattan, NY

NYCOER Voluntary Cleanup Program Implementation During Redevelopment – PWGC performed investigation and remediation of the subject property under the New York City Voluntary Cleanup Program (VCP). The site was assigned a Restrictive Declaration by NYCDEP due to the potential presence of hazardous materials at the site based on historical usage of the property. PWGC performed a Remedial Investigation that identified historic fill material throughout the site, and based on those findings developed an appropriate Remedial Action Plan (RAP) for the site. Remediation was performed by the redevelopment contractor concurrently with the construction of the building foundation under the oversight of PWGC. It consisted of removal of impacted soils/historic fill for offsite disposal, and the installation of a composite cover system and vapor barrier to prevent potential future exposures to residual impact left onsite. Remediation was completed in August 2015, and redevelopment was completed in Spring 2016. Mr. Melia managed all aspects of the VCP implementation, including coordination with regulatory agencies, preparation of the RI Work Plan and Report, preparation of the RAP, management remedial activities including soil disposal and vapor barrier installation, and preparation of a Remedial Closure Report.

United Properties Corporation - Jay's Lucky Cleaners, Oceanside NY

NYSDEC Brownfield Cleanup Program Implementation – Jay's Lucky Cleaners is a New York State BCP site which consists of a strip mall containing a drycleaner shop in Oceanside, New York. Phase I and II ESAs at the site identified PCE impact in groundwater and soil vapor beneath the site, and the site was entered into the BCP. As part of the BCP process, Mr. Melia developed an investigation scope of work and prepared a RI Work Plan to fully characterize environmental impacts in soil, groundwater and soil vapor beneath the site. Following NYSDEC approval of the RI Work Plan, Mr. Melia was responsible for managing the RI at the site which consisted of a geophysical survey, and soil, groundwater, and air sampling to characterize subsurface conditions throughout the property. Upon completion of RI field activities, Mr. Melia prepared a draft RI Report which included a detailed evaluation of geologic and hydrogeologic conditions beneath the site, and detailed analysis of the extent of impact beneath the site. Following review of the RI Report, NYSDEC requested that an IRM be performed at the site to address soil vapor intrusion within the existing building, and that a Supplemental RI be performed to further delineate the vertical extent of PCE impacted groundwater beneath the site. Based on NYSDEC comments, Mr. Melia prepared an IRM Work Plan which specified the installation of a sub-slab depressurization system (SSDS); NYSDEC has approved the IRM Work Plan, and construction of the SSDS is ongoing. In addition to the IRM Work Plan, Mr. Melia prepared a Supplemental RI Work Plan which included a scope of work to further delineate the vertical extent of groundwater impact beneath the site. The supplemental RI Work Plan is currently under review by NYSDEC.

Metro Management, Inc. - White Plains Courtyard Apartments, Bronx, NY

NYSDEC Brownfield Cleanup Program Implementation During Redevelopment – PWGC provided sub-surface investigation services and analysis of site conditions to get a previously rejected project entered into the NYSDEC Brownfield Cleanup program (BCP). Formerly an abandoned gas station, the current developer was able to obtain funding, upon acceptance into the BCP to remediate the VOC impacted groundwater and transform this abandoned lot into an eight story residential building with retail space on the first floor. Mr. Melia provided field and Health & Safety services and oversight for the Interim Remedial Measure, Remedial Investigation and Remedial Action phases of the project which were implemented during construction of the new mixed-use building. Mr. Melia assisted in preparation of the RI report, RAP and Final Engineering Report which documented the previous investigations, IRMs, remedial actions conducted, engineering controls installed, and the site management plan for the property. Due to the aggressive approach implemented at this site, the developer received his certificate of completion from the BCP program prior to construction activities being finished.

Grovick Properties, LLC - Former Citigas Service Station, Flushing, NY
NYSDEC Brownfield Cleanup Program - Mr. Melia provided Health & Safety and field oversight for the Remedial Investigation phase of the project. The investigation consisted of the installation and sampling of soil borings and groundwater sampling points using direct-push drilling methods and the collection of soil-vapor samples. Following completion of the investigation, Mr. Melia assisted in the preparation of the Remedial Investigation Report.

Former Computer Circuits Superfund Site, Hauppauge, NY
Remedial Investigation and Feasibility Study (RI/FS) – The Former Computer Circuits site is the location of a former manufacturer of printed circuit boards for military and commercial applications listed on the USEPA National Priority List. The site has since been renovated for use as commercial office space. A RI/FS performed at the site in 2000 documented trichloroethene (TCE) impact to groundwater and soil vapor beneath the site. An IRM consisting of a soil-vapor extraction (SVE) system was implemented at the site in 2007. As part of the IRM, Mr. Melia was responsible for overseeing installation of the SVE system to meet project specifications, preparing quarterly status reports for submittal to USEPA which documented TCE contamination to groundwater and soil vapor, and evaluated offsite transport of TCE impact in groundwater. Following the IRM, Mr. Melia prepared a Remedial Action Work Plan (RAWP) for the final remedy selected for the site which consisted of the continued operation of SVE treatment systems at the site, along with long-term groundwater, soil vapor, and indoor air monitoring. As part of implementation of the RAWP, Mr. Melia prepares annual Site Management Reports for the site which document existing TCE contamination to groundwater, soil vapor and indoor air, evaluate whether the SVE systems are effectively removing TCE impacted soil vapor from the subsurface, and evaluate offsite migration of TCE impacted groundwater.

CDM Federal - Lawrence Aviation Industries Superfund Site - Port Jefferson, NY
Remedial Investigation/Feasibility Study - Lawrence Aviation Industries is a former manufacturer of titanium for the aeronautics industry. The site has received numerous SCDHS and NYSDEC citations for improper disposal practices and releases, is listed on the National Priority List, and is the suspected source of trichloroethene (TCE) and tetrachloroethene (PCE) groundwater contamination in the area. Mr. Melia provided field oversight for drilling activities during the EPA RI/FS at the site. This included groundwater vertical profiling, installation and construction of multi-port monitoring wells and installation and sampling of deep soil borings. Roto-sonic drilling technology was utilized for all drilling activities. Mr. Melia's responsibilities included monitoring and documenting drilling activities and well construction, lithologic classification and logging of soils, managing the collection and analysis of soil and groundwater samples and documenting that procedures outlined in the Health & Safety plan were followed.

Baumann Bus, Gabreski Airport - Westhampton, NY
UIC Investigation/Remediation - Mr. Melia completed the investigation/remediation for Gabreski Airport which consists of approximately 58 acres owned by Suffolk County. The property was previously owned by the United States Air Force when the airport operated as a military air base. Following a 2004 site investigation, an on-site manhole was identified as containing elevated levels of semi-volatile organic compounds (SVOCs). A remedial workplan prepared for the site recommended the closure of unused sanitary structures. Mr. Melia was able to rapidly identify and inventory site structures through combination of file review and site inspections. He worked in conjunction with SCHDS to prepare evaluation criteria to assess which structures would require sampling. The revised sampling criteria allowed PWGC to target sampling to structures of concern and to control costs. Mr. Melia prepared an inventory sheet of the UIC structures present for the site, which did not previously exist. He thoroughly addressed site UIC issues so that structures which will not be required following site redevelopment may be properly closed without further need for assessment/ remediation.

Former Dial-Ace Uniform Site – Deer Park, NY
UIC Investigation/Remediation - The former Dial Ace Uniform Site is a former commercial laundry and drycleaner. Mr. Melia performed a Phase II ESA at the site to evaluate potential impact to soil and groundwater beneath the site, as well as the onsite sanitary system and industrial discharge drywells, as part of routine transactional due diligence prior to the sale of the property which documented VOC impact to soil and groundwater beneath the site, as well as within the industrial discharge drywells. Based on evaluation of impact identified, Mr. Melia determined that the impact identified in soil and groundwater was likely related to process water from the facility impacting the industrial discharge drywells, and such impact migrating elsewhere on the site. Based upon the findings of the Phase II ESA, the site was further investigated and remediated under the Suffolk County Department of Health Services (SCDHS) Underground Injection Control (UIC) Program. As part of remedial activities, Mr. Melia prepared Work Plans to further delineate the horizontal (off-site) and vertical extent of groundwater impact at the site, as well as a scope of work to evaluate soil vapor intrusion within the existing building, and managed the investigations, which included groundwater vertical profiles, and indoor air/soil vapor sampling. Following data collection, Mr. Melia prepared reports documenting the findings, evaluating the extent of impact, evaluating potential off site migration of impact, and providing remedial recommendations. Based on the findings of the Phase II ESA, supplemental groundwater sampling, and soil vapor intrusion evaluation, Mr. Melia prepared a Remedial Action Plan (RAP) which included the cleanout of impacted industrial drywells, removal of impacted soils acting as a source area for ground water impact, and installation of a sub-slab depressurization system (SSDS) within the existing building. Following SCDHS approval of the RAP, Mr. Melia was responsible for managing all remedial work performed at the site which included the removal of approx. 1200 tons of VOC impacted soils, installation of an active SSDS, and preparation of a Remediation Report and Operation, Monitoring and Maintenance Plan. The Remediation Report was accepted and SCDHS issued a No Further Action Letter for the site; the SSDS is still operational.

Islip Resource Recovery Agency, Blydenburgh Road Landfill - Islandia, NY
Groundwater/Leachate Monitoring - Mr. Melia conducted the quarterly groundwater sampling required by NY Environmental Conservation Rules and Regulations (NYCRR) Part 360. He monitored groundwater and leachate quality near the clean fill landfill, as well as Leachate Containment Basins to determine if landfills/basins operations are impacting groundwater quality and whether unnoticed failures of the leachate collection/storage systems occurred. As defined by NYCRR 360 regulations, Mr. Melia performed one baseline and three routine parameter-sampling events. He was responsible for

collection and analysis of groundwater and leachate samples from 27 groundwater-monitoring wells, two leachate containment basins, and four leachate storage tanks and recorded groundwater quality parameters in the field using a multi-parameter water quality meter. In addition, he collected water level measurements from the monitoring wells to prepare groundwater contour and potentiometric surface maps. Mr. Melia used monitoring and data analysis results to assist with quarterly report preparation as well as submittal of one annual report to the IRRA and NYSDEC and quarterly well condition and leachate monitoring reports to the Suffolk County Department of Public Works (SCDPW) as part of the IRRA's sewage-discharge certification requirement.

Jackson Plaza, LLC - Former Gloss-flo Chemical Site Brooklyn, NY
Soil and Groundwater Remediation - Mr. Melia provided oversight for the implementation of the Remedial Action Plan at the site. His activities included the excavation of more than 3,000 tons of VOC impacted soil and multiple injections of sodium persulfate solution throughout an area of impacted groundwater. Additionally, a vapor barrier, sub-slab depressurization system and injection/product removal wells were incorporated into the design of the new residential structure constructed at the site. Mr. Melia's responsibilities included monitoring and documenting excavation, drilling and injection activities and providing VOC and particulate air monitoring during the excavation phase of the project.

Allied Aviation Services - Nationwide
LaGuardia Airport Bulk Fueling Facility – Mr. Melia manages routine groundwater monitoring and sampling for the groundwater remediation program at Allied Aviation's LaGuardia Airport Bulk Fueling Facility. Mr. Melia coordinates periodic sampling, as well as removal of product from monitoring wells when necessary. Subsequent to monitoring and sampling, he prepares bi-weekly and quarterly status reports and the annual groundwater sampling report required by the site's MOSF license for submittal to the NYSDEC.
Newark Liberty International Airport – Mr. Melia manages routine groundwater monitoring and sampling at Allied Aviation's refueling station at Newark-Liberty International Airport. He is responsible for the coordination of periodic sampling and preparation of status reports for submission to NJDEP.

Prysmian Cable & Systems - Lexington, SC & Siemens Power Transmission & Distribution
Neptune Regional Transmission System, Wantagh Hwy, NY – To Support Neptune's Certificate of Environmental Compatibility and Public Need (Certificate) with the New York State Public Service Commission, Mr. Melia has provided independent Inspector services for the project. The project consists of two distinct portions, the upland cable route, which spans more than 13 miles along wetlands and parklands to install the power transmission cable, and the converter station constructed on a former NYS Department of Transportation landfill. For both portions, he performs environmental and safety inspections in accordance with the EM&CPs, permits and the Health & Safety Plan. Daily, he conducts inspections, monitors environmentally sensitive operations, and, if problems are noted, facilitates resolution by contacting the appropriate team managers. Subsequently, he documents the proposed or completed corrective actions. He participates in daily meetings summarizing any action items. Mr. Melia's involvement in the project as Inspector along the 13-mile cable route, that had multiple active work sites, eased the burden of the environmental compliance for the Environmental Safety & Health Manager who could not cover all areas. His proactive, one-on-one communication style assured the client that work was in accordance with the EM&CPs and permits, and that the NYSPSC and the overall environmental objectives would be satisfied in accordance to project documents

Multiple Clients (Wittmann Plumbing Associates, F&S Contracting, Atlas Fence Co., T. Moriarty & Sons, AD-Tech)
NYC Transit – Multiple Projects - Environmental Anticipatory Boring Program - Mr. Melia served as Project Manager for the environmental evaluation of in-situ soil and wastes generated on multiple NYC Transit (NYCT) capital improvement projects. Each project involved the preparation of multiple site-specific planning documents, utilizing his regulatory knowledge and available site data to optimize data usefulness and reduce costs while satisfying the NYCT and regulatory requirements. He oversaw the implementation of the plans and coordinated the field efforts. Upon completion of the field effort, he assisted with the preparation of a report that summarized activities, sample data, and provided recommendations for waste handling and disposal of soils that could not be reused.

American Environmental Assessment Corp. - Multiple Funeral Homes throughout Suffolk County, NY
Sanitary System Characterization and Remediation – Mr. Melia managed the characterization/remediation of on-site sanitary systems for facilities in violation of EPA UIC regulations (sites with on-site sanitary systems impacted by embalming fluid discharge). For each site, Mr. Melia prepared characterization and remediation work plans for submittal to USEPA and SCDHS, coordinated characterization and remediation work with and prepared closure reports for submittal to EPA and SCDHS.

New York City Housing Authority – Multiple NYCHA Developments
Investigation Work Plan Preparation – Mr. Melia prepares work plans for subsurface investigations at NYCHA developments with active petroleum releases. He reviews historical reports and sampling data, and develops site specific scope of work appropriate for each site. Each scope of work was designed to lead to development of a remedial action plan or spill closure. In addition, he negotiated/coordinated proposed scope of work with NYSDEC.

Certilman, Balin, Adler & Hyman, LLP
Mr. Melia provided general consulting services in support of potential litigation on behalf of several Funeral Home directors. Mr. Melia prepared a report summarizing applicable regulations and standards pertaining to the discharge of embalming fluids to sanitary and sewer systems as well as potential alternative non-toxic embalming chemicals and waste treatment/disposal methods.

Brookhaven National Laboratory - Upton, NY

HFBR and G-2 Tritium Investigation - Mr. Melia provided field engineering and oversight support to the HFBR and G-2 Tritium Investigations, which included the installation and sampling of temporary vertical profile wells. These investigations also included the installation and development of monitoring wells equipped with either bladder or submersible pumps. His responsibilities included managing the collection and analysis of groundwater samples, health and safety oversight, and coordinating the necessary permits. The work was performed under a Radiological Work Permit**.**

Building 96 PCB Remediation – Mr. Melia provided field and Health & Safety oversight for the Building 96 PCB Remediation project, which included the excavation and disposal of approximately 1,000 tons of poly-chlorinated biphenyl (PCB) impacted surface soil from the former scrap yard. Mr. Melia was responsible for monitoring and documenting excavation activities, as well as documenting that procedures outlined in the project Health & Safety Plan were followed.

Building 96 Silt Zone Remediation – Mr. Melia provided field and Health & Safety oversight for the chemical oxidant injection phase of the Building 96 Silt Zone Remediation project. This phase of the project included the collection of real-time VOC data using a membrane interface probe attached to direct push equipment, installation and sampling of monitoring wells within the project area and the chemical oxidation of a subsurface zone of silty soil suspected of being a source of VOC impact. Chemical oxidation of the silt zone was accomplished through the multiple applications of potassium permanganate ($KMnO_4$) injections throughout the suspected source area. Mr. Melia was responsible for monitoring and documenting drilling activities and chemical mixing and injection procedures, as well as documenting that guidelines outlined in the project Health & Safety Plan and Job Safety Analysis were followed.

OU III Airport Vertical Profiles - Mr. Melia provided field and Health & Safety oversight for the OU III Airport Vertical Profiles. His responsibilities included supervising the installation and sampling of groundwater vertical profiles to provide additional characterization of the carbon tetrachloride plume at the Dowling College Brookhaven Campus. The project was conducted in a residential area south of the BNL property, where residential sensitivity was essential. Mr. Melia was also responsible for sample management, daily reporting and coordinating the management of project generated wastes with the BNL field engineer.

Waste Management Support – Mr. Melia was responsible for the preparation of Maintenance Procedures for multiple systems at the Waste Management Facility including the Overhead Crane, Jib Crane and Shielded Cell in building 865 and the Ventilation Systems, Floor Coating and Grounds throughout the Facility. Mr. Melia also prepared Technical Work Documents and provided oversight for the refurbishment of the Shielded Cell window.

Kaitlyn Crosby • PROJECT HYDRO/ES

PROFESSIONAL EXPERIENCE

PWGC: 5 years

AREAS OF EXPERTISE

Water, Soil, Air Sampling
Field Work (Protocol, Oversight, Documentation)
Site Investigation/Analysis
Health & Safety Monitoring
Soil/Groundwater Investigations, Analysis, Sampling
(Manual; Direct Push Technology Techniques)
UST Remediation Hazardous Waste Site Investigation/Cleanup
Underground Injection Well Monitoring

EDUCATION & TRAINING/CERTIFICATION

BA, Environmental Studies (Sustainability Studies; Public Policy & Human Impact), Stony Brook University
OSHA HAZWOPER 40-hr; OSHA HAZWOPER 8-hr refresher
OSHA 10-Hour Construction

PROFILE

Kaitlyn Crosby earned her Bachelor of Arts degree in Environmental Studies with a Minor in Sustainability Studies concentrating on Public Policy & Human Impact from Stony Brook University. She proved herself in the realm of hydrogeology, soil sampling and field studies and is continuously improving her skills as a field inspector in the areas of civil, structural, and environmental engineering. She has an excellent record in timely completion and maintenance of project coordination, monitoring, and document preparation, while successfully maintaining communication between clients, government agencies, and other parties involved.

NOTABLE PROJECTS

Computer Circuits, Hauppauge, New York

Ms. Crosby performed groundwater and air sampling in accordance with the USEPA-approved work plan for the investigation at this Federal Superfund site. The investigation consisted of soil, groundwater, and air sampling, and the installation and operation of a soil/vapor extraction system. Ms. Crosby performed sampling activities following the QA/QC procedures detailed in the work plan.

GTJ-Group/Green Bus Lines, Inc. - Queens/Brooklyn, NY

Hydrogeology/Environmental Services - Services range from Site Remediation Management & Baseline Environmental Report Preparation (Project Coordination, Oversight and Sample Collection) at large bus facilities. Ms. Crosby conducted site/facility investigations and provided, on an accelerated time schedule, site investigations, remedial action planning and design for dissolved and free phase groundwater contamination treatment systems.

83 Walker Street, Manhattan, New York

New York City Office of Environmental Remediation (NYCOER) Redevelopment Project – Ms. Crosby provided field oversight services to an "E" Designation site at 83 Walker Street. Her responsibilities included, but were not limited to, soil sampling, groundwater sampling, soil vapor samplings, air monitoring for dust and VOCs during earthwork, and inspection of vapor barrier installations. Ms. Crosby documented daily soil removal and noted any soils that may be contaminated. In addition to these services, she completed daily logs, communicated with the NYCOER, clients, government agencies and other parties involved and ensured proper handling and distribution of the soil samples.

Carco Builders Corp., Freeport, NY

Underground Injection Control (UIC) Remediation - Ms. Crosby performs endpoint sampling of storm drains and sanitary systems, coordinates and performs sampling in conjunction with the Suffolk County Department of Health Services (SCDHS) and Nassau County Department of Health (NCDH), and ensures proper soil and sediment removal.

North Eight NY LLC, Brooklyn, NY

NYCOER "E" Designation Services - Ms. Crosby provided field oversight services to an "E" Designation site at 207 North 8th Street. Her responsibilities included, but were not limited to, soil sampling, groundwater sampling, water level measurement and soil vapor samplings. She conducted site inspections to identify AOCs and physical obstructions and provided oversight on the installation of five soil borings. Ms. Crosby documented daily soil removal and noted

any soils and groundwater that may be contaminated. In addition to these services, she completed daily logs, communicated with the NYCOER, clients, government agencies and other parties involved and ensured proper handling and distribution of the soil samples.

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LDC Company Profile

LDC is a small, minority-owned (SBE/MBE) quality assurance and environmental chemistry company focused on data validation, data quality assessment, database implementation, and data usability. Our primary services include data validation, electronic transfer of data, oversight of quality assurance/quality control (QA/QC) programs, laboratory and field audits, technical support for litigation, and database management. Our corporate office located in Carlsbad, California is directed by Mr. Scott Denzer and Ms. Stella Cuenco, principal chemists with over 45 years of experience between them in the environmental laboratory and data validation industries

LDC is recognized as one of the leaders in the data validation industry through participation on major DoD and commercial projects such as:

- Army Corps of Engineers, DuPont Chambers (Baltimore District)
- Army Corps of Engineers, DuPont Chambers (Philadelphia District)
- Army Corps of Engineers, Various projects (New Mexico)
- Army Corps of Engineers, Camp Navajo (Tetra Tech)
- Army Corps of Engineers, Various projects, 8a Contract (Sacramento District)
- Army Corps of Engineers, Fort Ord (Shaw E&I)
- Las Vegas Wash Henderson Site (ERM)
- DOE NPR-1 Elk Hills (DOE direct and Ahtna)
- Nevada Environmental Response Trust (NERT) Henderson Site (Ramboll Environ)
- NOAA MDRA Mississippi Site (Entrix)
- Stringfellow Superfund Site (DTSC)
- BKK Landfill (Ramboll Environ)
- EPA Region IX ESAT QA Program (ICF)
- AFCEE/AFCEC, Andersen AFB (EA/Shaw)
- AFCEE/AFCEC, Loring/Pease AFB (Bechtel/MWH)
- AFCEE/AFCEC, Mather AFB (MWH)
- AFCEE/AFCEC, Army Corps of Engineers, Travis AFB (CH2M Hill)
- AFCEE/AFCEC, McClellan and Castle AFB (Jacobs Engineering Group)
- AFCEE/AFCEC, Beale AFB (Law/Crandall, Inc.)
- AFCEE/AFCEC, Andrews AFB (URS)
- Navy CLEAN Atlantic Division (EA Engineering)
- Navy CLEAN IV Southwest DIV (AECOM)
- Navy RAC Southwest Division (OHM Remediation/IT Group/Shaw)

LDC has successfully performed over 500 data validation projects worth over 10 million dollars for prime contractors servicing Air Force (AFCEE/AFCEC), Army Corps, Navy, and industrial activities.

LDC has developed well-documented procedures which support all facets of the data validation process. This includes critical steps such as:

- Project tracking
- Peer review for all data validation activities
- Internal training programs
- Internal and external audits
- Strict documentation
- Electronic deliverables

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LDC as the "Best Value" Contractor

LDC is a data validation subcontractor with an impeccable track record for timeliness, quality, technical expertise, and the ability to mitigate complex data quality issues. Our clients will confirm our current and past performance under DoD (including USACE), DoE, and commercial programs. We have experience and a proven track record commensurate with the requirements of this RFP as demonstrated by the following:

- **LDC is the software developer and expert in the use of the Automated Data Review (ADR) software**. LDC has been using the ADR.NET version for over 3 years and has the current version in full implementation which meets USACE and current DoD QSM requirements. LDC has performed over 1000 ADR projects in the past 10 years, worth over $2,000,000 in revenue. LDC will provide technical support to the Client as needed for e-QAPP generation or EDD troubleshooting.

- Data validation experience as a subcontractor for more than 100 Army Corps sites, over 140 AFCEE/AFCEC sites, several EPA sites, and under 6 Navy CLEAN and RAC contracts and 150 Navy sites. This experience includes 15 years of data validation work under USACE direction and thorough understanding of the USACE Baltimore, EPA Region 2 and 3 validation guidelines, and the DoD QSM.

- Successful completion of USACE data validation activities since 1992 under subcontracts to various Districts including New England, Baltimore, Philadelphia, Omaha, Albuquerque, Seattle, Sacramento, and Jacksonville.

- Recent project experience in the Eastern region including support to four separate contractors on the Passaic River for varied projects and programs with revenues of 200K, and Gowanus Canal with GEI, revenues of 33K.

- **On-time delivery record of greater than 99%** with the ability to expedite turnaround as needed due to our large experienced staff as noted above.

- Successful completion of five DoD and two DoE audits to approve LDC's internal data validation procedures, QA program and documentation systems. (prior to 2000)

- Thorough secondary QA review program and **the capacity (33 full time chemistry staff) to handle a project of this magnitude and importance.** This significantly reduces additional work the consultant might otherwise need to do upon receipt of LDC reports.

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Data Validation Capacity

LDC is continually evaluating and monitoring its capacity to meet client needs. It is company policy to not accept a project unless the service can be completed on-time with our expected quality of performance. This policy has proved very successful in meeting past project deadlines. Our client references will confirm our performance of on-time delivery.

Due to the versatile capabilities of our staff, personnel can also support multiple areas which are high in backlog. Our training program documents personnel approvals for all data review activities. All of our staff actively participate in the LDC training program.

LDC has met its contractual turnaround time requirement on over 99% of the projects completed. LDC has successfully completed projects which required data review capacity of as many as 2000 samples in one month.

Technical / Management Approach

LDC has established data validation and data management procedures which enable the thorough, consistent, timely, and efficient review of analytical data. Ms. Stella Cuenco, principal chemist, is responsible for all data validation related activities and has final authority for the company. The designated Project Manager will coordinate the day to day data validation activities and interface with the Client project chemist or PM as necessary. For day to day data review activities, data validators report directly to the senior chemist in the section of the review. Senior chemists report to the technical project manager. Data validation will be performed following the Client project specific requirements as stated in the Scope of Work (SOW).

As the Client alerts LDC of in-coming SDGs and associated ADR EDDs, the LDC project manager will log the order into the up-coming project list identified as the "LDC Project Backlog" form. This is now considered a booked order and is reserved a place in the schedule. The project manager will allocate and schedule staff resources for the project. He will generate a project specific summary which will detail the expected receipt date of the order, the due date, special method or QC requirements, and the data quality objectives (DQOs) of the project.

Once the data packages arrive, the packages are logged in according to LDC SOP 6.0.0 "Standard Operating Procedure for Sample Data Log-in". Computer generated worksheets for each SDG along with the "LDC SDG Table" and "LDC Sample Validation" spreadsheet are distributed to all project staff.

The "LDC SDG Table" spreadsheet is specific to each order and provides the project manager with an overview of individual SDGs and their associated analyses. Progress of projects is indicated daily on the spreadsheet. The "LDC Sample Validation" spreadsheet identifies individual analysis requested for all samples and supports the data reviewer in verifying that appropriate samples have been reviewed in each data package. The previously discussed tools and processes have been used to successfully meet deadlines and estimate project completion dates. Meetings are held routinely to assess the status of each project.

Throughout the data review process, the project manager monitors project status as stated above. If any scheduling or technical complications arise such that the quality of the review will be impacted, data review staff notify the project manager immediately for resolution. The project manager will keep the Client chemist current on the progress of all validation activities on a

routine basis via e-mail and telephone. Once the data review worksheets have been completed and approved by a secondary review, the final technical reports are written. All final technical reports are reviewed by at least two senior staff. This may include the Technical Project Manager, QA Director, or Lead Chemist. Upon shipping the final report, the Client project chemist will be contacted by phone.

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Data Review/Validation Process

The data review and validation level of effort required for the Scope of Work outlined for this project will encompass several activities. The steps can be categorized in the following manner:

1) Sample Log-in

All samples submitted for data validation are entered into the LDC Log-in system. The system generates various spreadsheets for sample tracking, listings of laboratory and client identifications, sampling dates, analysis requested, matrix, and project due date. These tracking documents are distributed to all data validation, QA and project management staff.

2) Pre-screening of Data Packages

The pre-screening is performed concurrently with the sample log-in process. This task verifies sample chain-of-custody, data package completeness, and concurrence with the authorized delivery order.

3) Data Validation

The execution of the data review task requires the highest level of effort. The review process will be handled in a stepwise fashion including manual and automated data review. The validator will use manual review to document each finding on a Validation Findings form. Along with the finding, the reviewer will document the date of the occurrence, the lab reference identification, the validation criteria, the associated samples, and the qualification of the data. A Validation Checklist form is marked noting if validation criteria was met or exceeded. A Validation Checklist is enclosed for review (Exhibit A). These checklists are used as an inventory sheet to assure all samples were reviewed for each criteria. The findings documented on the Validation Findings form will be transcribed into the final summary report. Examples of recalculation and findings worksheets used for Level 4 validation are available for review upon request.

All initial validation performed by LDC has a secondary peer review. All final reports will be reviewed by a Senior Chemist or Principal Chemist.

4) First Report Review

The first review of the data validation report verifies that all findings and data qualification has been accurately transferred from the data validation worksheets. All sample identifications, methods, formatting, and general text are reviewed.

5) Senior Report Review

The senior review of the data validation report verifies that all findings, data qualification, and professional judgments previously integrated into the reports reflect the overall quality of the data. Any additional comments required to enhance the usability of the report will be inserted at this time.

6) QA Report Review

A QA check of selected data validation reports within an individual delivery order will be reviewed by the QA department. A formal nonconformance report will be generated for any identified deficiencies. The deficiency will be addressed with the appropriate staff and corrected prior to submittal to senior management for final review and signature.

7) Senior Management Review

The program/technical manager will perform an overall review of the final reports. He will sign the report cover letter and submit the report to the sample custodian for shipment to the client.

8) Electronic Data Deliverables (EDD)

This process will be initiated at step 1 with the receipt of disks from the client or loading EDDs to LDC's secured Internet portal. After automated verification of the EDD format, content, and fields, the EDD will be populated with the manual review for importing of the final data qualifiers. The final approval of qualifiers will occur after step 5.

LDC will self-perform the above tasks to maintain quality and control of the work product.

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Exhibit A

LDC #:____
SDG #:____
Laboratory:___

VALIDATION COMPLETENESS WORKSHEET

EPA Level IV

Date:_____
Page:_of_____
Reviewer:
2nd Reviewer:

METHOD: GC/MS VOA (EPA SW 846 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	/	
II.	GC/MS Instrument performance check		
III.	Initial calibration/ICV	/	
IV.	Continuing calibration		
V.	Laboratory Blanks		
VI.	Field blanks		
VII.	Surrogate spikes		
VIII.	Matrix spike/Matrix spike duplicates		
IX.	Laboratory control samples		
X.	Field duplicates		
XI.	Internal standards		
XII.	Compound quantitation RL/LOQ/LODs		
XIII.	Target compound identification		
XIV.	System performance		
XV.	Overall assessment of data		

Note:
A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank
SB=Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1				
2				
3				
4				
5				

Notes:

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LDC Corporate Resources

LDC personnel have experience and formal training in the areas of data validation, electronic data deliverables and laboratory QA/QC. LDC personnel have performed data validation in all analytical disciplines. These include, but are not limited to, GC/MS volatiles, GC volatiles, GC/MS semivolatiles, GC pesticides, ICP metals, ICP/MS metals, GFAA metals, GC petroleum hydrocarbons, GC/MS dioxins, explosives, radiochemistry, and wet chemistry. This versatility allows our organization to adapt to workload changes and allows for an excellent secondary review system. Our organization is structured to allow direct communication between project managers, data validators, and clerical staff which occurs on a daily basis.

With LDC's 25+ years as a national leader in the data validation industry and extensive experience supporting projects with multiple EPA regions, DoD and DOE facilities, LDC is confident our data validation services will successfully meet all project requirements. The validation group is managed by Ms. Stella Cuenco, principal chemist, who has over 25 years of experience, the software products and services group is managed by Mr. Scott Denzer, who has over 35 years of experience, and the overall operations are directed by Mr. Michael Takaki, president.

The validation group is divided into chemists by discipline, organics (GC/MS, GC and HPLC) and inorganics (wet chemistry, IC, ICP, ICP/MS). All chemists report to senior group leads. A separate group performs data package log-in to the LDC tracking system. Another group performs the EDD population and verification. Shauna McKellar, Chemist and Project Manager, leads this group and has over 6 years of experience in EDD population, preparation, and uploading to various databases.

The majority of the data validation staff at LDC have been employed for over 10 years with some senior staff over 15 years as noted in the attached resumes. This level of stability and experience will ensure project stability and consistency.

In addressing LDC's financial status, LDC has an excellent Dun & Bradstreet report and has been profitable for the past 15 years. LDC has grown at approximately 10% in each of the past 5 years and continues to be a leader in our environmental sector of the data quality business. References are available from our vendors and clients to confirm our business success. Our annual revenue of approximately $6,000,000 per year in data validation work makes LDC one of the largest independent data validation firms in the nation. In 2001, Mr. Richard Amano was the San Diego SBA Small Businessman of the Year through our sponsor Earth Tech.

LDC will commit the resources and materials to successfully complete this project with the required time period and with a high level of quality.

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Project Team Summary

LDC personnel have hands-on experience in the areas of data validation, laboratory QA/QC, CLP SOWs, and environmental laboratory analyses. As documented in the resumes of our staff, the project team has significant experience with USACE and DoD protocols, current technology, SW-846, and all methods stated in the SOW.

LDC is presenting the following staff to perform key roles for this contract. The key staff of the project team and their experience are as follows:

- **Stella Cuenco, Principal Chemist/Operations Manager**
  Project Role: Principal Chemist/Program Manager
  Data Validation Experience: 20 years
  Overall Laboratory and Data Validation Experience: 25 years
  B.S. Chemistry, University of the Philippines, 1991

  Ms. Cuenco has over 25 years of environmental laboratory and data validation experience under DoD and EPA guidelines. Her experience includes performance of data validation in gas chromatography/mass spectrometry for volatile and semivolatile organics and extensive Navy and EPA data review and data verification for all organic and inorganic analyses. Her laboratory experience includes hands-on CLP and SW-846 GC/MS methods.

- **Pei Geng, Senior Chemist/Project Manager**
  Project Role: Senior Organic Data Validator
  Data Validation Experience: 19 years
  Overall Laboratory and Data Validation Experience: 26 years
  M.S. Chemistry, Sam Houston University, 1989

  Ms. Geng will perform the role of organic data validator for this project. She will perform data validation for GC/MS and gas chromatography analyses and serve as a peer reviewer in the initial validation review process.

  Ms. Geng has 26 years of environmental laboratory and data validation experience. Her experience includes performance of data validation in the gas chromatography area for volatile and semivolatile organics and extensive DoD data review and data verification for all organic analyses. Her laboratory experience includes hands-on CLP and SW-846 GC/MS methods.

- **Richard M. Amano, Principal Chemist**
  Project Role: Senior Technical Reviewer/Director
  Data Validation Experience: 25 years
  Overall Laboratory and Data Validation Experience: 37 years
  B.S. Biochemistry, UCLA, 1979

  Mr. Amano has over 37 years of environmental laboratory, QA/QC, and data validation experience. He has managed data validation projects using the DoD QSM data validation guidelines for the past twenty years. Prior to founding LDC in 1991, he directed two major laboratories, Analytical Technologies, Inc. and Brown and Caldwell, from 1983 to 1991. His data validation experience includes oversight and direction of major efforts for Superfund sites, DoE sites, Navy RI/FS projects, Army Corps of

Engineers investigations, and AFCEE/AFCEC projects. He also has overseen several laboratory audits for major analytical testing programs for the Navy, Texaco, and Hewlett-Packard. His laboratory experience includes hands-on CLP and SW-846 GC/MS analysis, direction of GC/MS (including TO-14 air analyses) and radiochemistry groups, dioxins method development, and complex GC data interpretation of Aroclors. He has performed expert witness support for litigation purposes.

- **Erlinda T. Rauto, Principal Chemist**
  Project Role: Technical Reviewer
  Data Validation Experience: 23 years
  Overall Laboratory and Data Validation Experience: 36 years
  B.S Chemical Engineering, Feati University, Manila, 1967

  Ms. Rauto will perform the role of Technical Reviewer for this project. She will monitor schedules, compliance of the validation to the applicable documents, perform routine surveillance activities such as generation of nonconformance reports, validator training, and QA reports to management.

  Ms. Rauto has over 36 years of environmental laboratory and data validation experience. She has worked under the DoD QSM data validation guidelines for the past 10 years. Her experience includes performance of data validation in the GC, trace metals, and wet chemistry areas for major Federal projects. Her laboratory experience includes hands-on CLP and SW-846 ICP/GFAA analysis, pesticide/PCBs and wet chemistry analysis.

- **Christina Rink-Ashdown, Inorganic Chemist**
  Project Role: Inorganic Data Validator/Project Manager
  Data Validation Experience: 7 years
  Overall Laboratory and Data Validation Experience: 9 years
  B.S. Biology, University of California, San Diego 2006

  Ms. Rink-Ashdown will perform the role of day to day Project Manager for this project. She will monitor schedules, compliance of validation to the Required Guidelines, perform routine surveillance activities such as generation of non-conformance reports, validator training and QA reports to management.

  Ms. Rink-Ashdown has over 9 years combined environmental laboratory and data validation experience. Her experience includes performance of data validation in the trace metals, radiochemistry, and wet chemistry areas for major Federal and commercial projects. Her laboratory experience includes hands-on CLP and SW-846 ICP/CVAA analysis and overall technical review of data deliverables.

  Ms. Rink-Ashdown specializes in the data validation of radiochemistry, trace metals, wet chemistry, and methyl mercury and analyses under MARLAP and USEPA functional guidelines or equivalent protocol. Over the past two years, she has worked under various DoD, CERCLA and EPA data validation guidelines for the various CERCLA, Navy, Army Corps, AFCEE/AFCEC and commercial projects. She is also certified as a “Radiometric Data Validation Specialist” through course work and testing by the Radiochemistry Society.

- **Shauna McKellar, Chemist / Project Manager**
  Project Role: Chemist
  Data Validation Experience: 6 years
  Overall Laboratory and Data Validation Experience: 11 years
  B.S. Environmental Toxicology, UC Davis, 2006

  Ms. McKellar has over 11 years of environmental consulting and data validation experience. She has worked under EPA data validation guidelines for the past 6 years and has inorganic and organic data validation experience using USEPA functional guidelines, Navy procedures, project QAPPs, ADEC checklists, and other applicable documents for EPA, DoD and commercial projects.

  Ms. McKellar specializes in the data validation and contract compliance screening using LDC's Automated Data Review (ADR) software, and is familiar with a variety of different Electronic Data Deliverable formats, including SEDD and NEDD. She has supervised large data validation projects under the USACE and Navy Southwest Division RAC contracts

- **Tony Rommelfanger, Data Control Manager**
  Project Role: Data Custodian

  Mr. Rommelfanger will perform the role of data custodian for this project. He will perform the log-in of all data packages into the LDC tracking system. This system will generate spreadsheets for identifying all samples, their collection date, analysis performed, matrix, and report due date. Upon the completion of each delivery order, he will archive and catalog all reports and data in a secured storage area.

  Mr. Rommelfanger has 26 years of experience in laboratory and data management experience. He has experience in organizing, logging in, and tracking data packages for technical staff.

Site: Site Name
Laboratory: Laboratory Name
Report No.: Lab Number
Reviewer: Validator's Name/Laboratory Data Consultants for Client
Date: Date

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
Sample-1	11A000-01	1,4-Dioxane, PCB, and PFAS

Associated QC Samples(s):
Field/Trip Blanks: Equipment Blank, Field Blank
Field Duplicate pair: Sample-1 and DUP

The above-listed water sample was collected on August 9, 2017 and was analyzed for 1,4-dioxane by SW 846 method 8270D in selected ion monitoring (SIM) mode, polychlorinated biphenyls (PCBs) by SW-846 method 8082A, and perfluooralkyl & polyfluoroalkyl substances (PFASs) by SOP 434-PFAAS. The data validation was performed in accordance with the USEPA Region 2 *Standard Operating Procedure for Semivolatile Data Validation*, SOP HW-35A, Revision 0 (June 2015), the USEPA Region 2 *Standard Operating Procedure for Validating PCB Compounds, PCBs by Gas Chromatography SW-846 Method 8082A*, SOP HW-45, Revision 1 (October 2006), USEPA Region 2 *Standard Operating Procedure for Validating Chlorinated Herbicides*, SOP HW-17, Revision 3.1 (December 2010), and the USEPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, EPA 540-R-2017-002 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The organic data were evaluated based on the following parameters:

- Data Completeness
- Holding Times and Sample Preservation
- Gas Chromatography/Mass Spectrometry (GC/MS) Tunes
- GC/Electron Capture Detector (GC/ECD) Instrument Performance Checks
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tunes
- Initial and Continuing Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Control Sample (LCS) Results
- Internal Standards/Labeled Compounds
- Field Duplicate Results
- Quantitation Limits and Data Assessment
- Sample Quantitation and Compound Identification

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times and Sample Preservation

All criteria were met.

GC/MS Tunes

1,4-Dioxane

All criteria were met.

GC Instrument Performance Checks

PCB

All criteria were met.

LC/MS Tunes

PFAS

All criteria were met.

Initial and Continuing Calibrations

1,4-Dioxane and PCB

All criteria were met.

PFAS

Initial Calibration:

All criteria were met.

Continuing Calibration:

Compounds that did not meet criteria are summarized in the following table.

Date	Instrument ID	Compound	CC %D	Associated Samples		Validation Action
08/12/17	CCV1	Perfluorohexanesulfonic acid	33.4	Sample-1	XX	J detects
		Perfluorooctanesulfonic acid	38.5		XX	J detects

X = Initial calibration (IC) relative standard deviation (%RSD) > 20; estimate (J/UJ) positive and nondetect results.
XX = Continuing calibration (CC) percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
SS = Second source verification percent difference (%D) > 30; estimate (J/UJ) positive and nondetect results.
+ = Response factor (RRF) < validation criteria; estimate (J/UJ) positive and nondetect results.

The perfluorohexanesulfonic acid and perfluorooctanesulfonic acid results were estimated due to continuing calibration exceedances. The bias cannot be determined. The results can be used for project objectives as estimated values (J) which may have a minor impact on the data usability.

Blanks

1,4-Dioxane and PCB

Contamination was not detected in the method blanks.

No positive results were found in the equipment blank Equipment Blank and field blank sample Field Blank for 1,4-dioxane and PCB analyses.

PFAS

Contamination was not detected in the method blanks.

Contamination was detected in the equipment blank Equipment Blank and field blank sample Field Blank for the PFAS analysis. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action Levels (ALs) were established at the reporting limit (RL) for contaminants. The following table summarizes the contamination detected.

Field Blank ID	Compound	Level Detected	Action Level	Associated Samples
Equipment Blank	Perfluorohexanesulfonic acid	3.2 ng/L	RL	Sample-1
	Perfluorooctanesulfonic acid	11 ng/L	RL	
Field Blank	6:2FTS	2.7 ng/L	RL	Sample-1
	Perfluorohexanesulfonic acid	3.2 ng/L	RL	
	Perfluorooctanesulfonic acid	11 ng/L	RL	

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.

No samples were qualified since the associated sample results were nondetect or greater than the action level.

Surrogate Recoveries

All criteria were met.

MS/MSD Results

MS/MSD analyses were not associated with this sample set. Validation action was not required on this basis.

LCS Results

All criteria were met.

Internal Standards/Labeled Compounds

1,4-Dioxane and PCB

All criteria were met.

PFAS

The following table lists the labeled compounds recovered outside of control limits and the resulting actions.

Sample	Labeled Compound	%R (Limits)	Affected Compounds	Validation actions
Sample -1	13C7-Perfluorooctanesulfonic acid	43 (50-150)	Perfluorobutanesulfonic acid Perfluorodecanesulfonic acid Perfluoroheptanesuofonic acid 6:2FTS	J detects/UJ nondetects J detects/UJ nondetects J detects/UJ nondetects J detects/UJ nondetects

The perfluorobutanesulfonic acid, perfluorodecanesulfonic acid, perfluoroheptanesuofonic acid, and 6:2FTS results were estimated due to labeled compound exceedance. The bias cannot be determined. The results can be used for project objectives as estimated values (J) or nondetects with estimated quantitation limits (UJ) which may have a minor impact on the data usability.

Field Duplicate Results

1,4-Dioxane and PCB

Samples Sample-1 and DUP were submitted as the field duplicate pair with this sample group. There were no detected compounds in the field duplicate pair for 1,4-Dioxane and PCB.

PFAS

Samples Sample-1 and DUP were submitted as the field duplicate pair with this sample group. The following table summarizes the concentrations and validation actions taken.

Compound	Concentration (mg/L)		RPD
	Sample-1	DUP	
Perfluorobutanesulfonic acid	44	48	9
Perfluorohexanoic acid	910	890	2
Perfluoroheptanoic acid	63	73	15
Perfluorobutanoic acid	21	23	9
Perfluoroheptanesulfonic acid	160	170	6
Perfluoropentanoic acid	210	220	5
Perfluorohexanesulfonic acid	4300	4300	0
Perfluorooctanoic acid	150	170	13
Perfluorooctanesulfonic acid	17000	18000	6
Perfluorononanoic acid	4.1	4.9	18

Quantitation Limits and Data Assessment

No results were reported below the reporting limit (RL) and above the method detection limit (MDL) and above the MDL in the 1,4-dioxane, PCB, and PFAS analyses.

Due to high target compound levels or difficult sample matrix, select samples were analyzed at dilutions. The following table lists the sample dilutions which were performed and the results reported. RLs were elevated accordingly.

Sample	PFAS Analysis Reported
Sample-1	10-fold dilution due to high target compound levels for perfluorohexanoic acid and perfluoropentanoic acid
Sample-1	100-fold dilution due to high target compound levels for perfluorohexanesulfonic acid and perfluorooctanesulfonic acid.

Dilutions were not required for 1,4-dioxane and PCB analyses.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.

J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified "J" data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The 'J' data may be biased high or low or the direction of the bias may be indeterminable.

UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified "UJ" data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The 'UJ' data may be biased low.

JN - The analysis indicates the presence of a compound that has been "tentatively identified" (N) and the associated numerical value represents its approximate (J) concentration.

R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

APPENDIX F
LABORATORY SOPs FOR PFAS ANALYSIS

Determination of Selected Perfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)

Reference: EPA Method 537, Version 1.1, September 2009, EPA Document #: EPA/600/R-08/092

EPA Method 537.1, Version 1, November 2018, EPA Document #: EPA/600/R-18/352

Department of Defense, Quality Systems Manual for Environmental Laboratories, Version 5.1, 2017

1. Scope and Application

Matrices: Drinking Water, Non-potable water

Definitions: Refer to Alpha Analytical Quality Manual.

1.1 This is a liquid chromatography/tandem mass spectrometry (LC/MS/MS) method for the determination of selected perfluorinated alkyl substances (PFASs) in drinking water. Accuracy and precision data have been generated in reagent water, and finished ground and surface waters for the compounds listed in Table 1.

1.2 The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

1.3 This method is restricted to use by or under the supervision of analysts experienced in the operation of the LC/MS/MS and in the interpretation of LC/MS/MS data. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability.

Table 1

Parameter	Acronym	CAS
Hexafluoropropylene oxide dimer acid [1]	HFPO-DA	13252-13-6
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4

Table 1 (cont.)

Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorotetradecanoic acid	PFTA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnA	2058-94-8
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid [1]	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid [1]	9Cl-PF3ONS	756426-58-1
4,8-dioxa-3H-perfluorononanoic acid [1]	ADONA	919005-14-4

[1] Compounds included as part of EPA 537.1 only.

2. Summary of Method

2.1 A 250-mL water sample is fortified with surrogates and passed through a solid phase extraction (SPE) cartridge containing polystyrenedivinylbenzene (SDVB) to extract the method analytes and surrogates. The compounds are eluted from the solid phase with a small amount of methanol. The extract is concentrated to dryness with nitrogen in a heated water bath, and then adjusted to a 1-mL volume with 96:4% (vol/vol) methanol: water after adding the IS(s). A 3µL injection is made into an LC equipped with a C18 column that is interfaced to an MS/MS. The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical LC/MS/MS conditions. The concentration of each analyte is determined by using the internal standard technique. Surrogate analytes are added to all Field and QC Samples to monitor the extraction efficiency of the method analytes.

2.2 Method Modifications from Reference

2.2.1 None.

3. Reporting Limits

3.1 The reporting limit for PFAS's is 2 ng/L (4ng/L for HFPO-DA).

4. Interferences

4.1 PFAS standards, extracts and samples should not come in contact with any glass containers or pipettes as these analytes can potentially adsorb to glass surfaces. PFAS analyte, IS and SUR standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers.

4.2 Method interferences may be caused by contaminants in solvents, reagents (including reagent water), sample bottles and caps, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. The method analytes

in this method can also be found in many common laboratory supplies and equipment, such as PTFE (polytetrafluoroethylene) products, LC solvent lines, methanol, aluminum foil, SPE sample transfer lines, etc. All items such as these must be routinely demonstrated to be free from interferences (less than 1/3 the RL for each method analyte) under the conditions of the analysis by analyzing laboratory reagent blanks as described in Section 9.2. **Subtracting blank values from sample results is not permitted.**

4.3 Matrix interferences may be caused by contaminants that are co-extracted from the sample. The extent of matrix interferences will vary considerably from source to source, depending upon the nature of the water. Humic and/or fulvic material can be co-extracted during SPE and high levels can cause enhancement and/or suppression in the electrospray ionization source or low recoveries on the SPE sorbent. Total organic carbon (TOC) is a good indicator of humic content of the sample. Under the LC conditions used during method development, matrix effects due to total organic carbon (TOC) were not observed.

4.4 Relatively large quantities of the preservative (Sect. 6.2.1) are added to sample bottles. The potential exists for trace-level organic contaminants in these reagents. Interferences from these sources should be monitored by analysis of laboratory reagent blanks (Sect. 9.2.1), particularly when new lots of reagents are acquired.

4.5 SPE cartridges can be a source of interferences. The analysis of field and laboratory reagent blanks can provide important information regarding the presence or absence of such interferences. Brands and lots of SPE devices should be tested to ensure that contamination does not preclude analyte identification and quantitation.

5. Health and Safety

5.1 The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

5.2 All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.3 PFOA has been described as “likely to be carcinogenic to humans.” Pure standard materials and stock standard solutions of these method analytes should be handled with suitable protection to skin and eyes, and care should be taken not to breathe the vapors or ingest the materials.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection

6.1.1 Samples must be collected in three (3) 250-mL high density polyethylene (HDPE) container with an unlined plastic screw cap.

6.1.2 The sample handler must wash their hands before sampling and wear nitrile gloves while filling and sealing the sample bottles. PFAS contamination during sampling can occur from a number of common sources, such as food packaging

and certain foods and beverages. Proper hand washing and wearing nitrile gloves will aid in minimizing this type of accidental contamination of the samples.

6.1.3 Open the tap and allow the system to flush until the water temperature has stabilized (approximately 3 to 5 min). Collect samples from the flowing system.

6.1.4 Fill sample bottles, taking care not to flush out the sample preservation reagent. Samples do not need to be collected headspace free.

6.1.5 After collecting the sample, cap the bottle and agitate by hand until preservative is dissolved. Keep the sample sealed from time of collection until extraction.

6.1.6 Field Reagent Blank (FRB)

6.1.6.1 A FRB must be handled along with each sample set. The sample set is composed of samples collected from the same sample site and at the same time. At the laboratory, fill the field blank sample bottle with reagent water and preservatives, seal, and ship to the sampling site along with the sample bottles. For each FRB shipped, an empty sample bottle (no preservatives) must also be shipped. At the sampling site, the sampler must open the shipped FRB and pour the preserved reagent water into the empty shipped sample bottle, seal and label this bottle as the FRB. The FRB is shipped back to the laboratory along with the samples and analyzed to ensure that PFASs were not introduced into the sample during sample collection/handling.

6.1.6.2 The same batch of preservative must be used for the FRBs as for the field samples.

6.1.6.3 The reagent water used for the FRBs must be initially analyzed for method analytes as a MB and must meet the MB criteria in Section 9.2.1 prior to use. This requirement will ensure samples are not being discarded due to contaminated reagent water rather than contamination during sampling.

6.2 Sample Preservation

6.2.1 The preservation reagent, listed in the table below, is added to each sample bottle as a solid prior to shipment to the field (or prior to sample collection).

Table 2

Compound	Amount	Purpose
Trizma	5.0 g/l	Buffering reagent and removes free chlorine

6.3 Sample Shipping

6.3.1 Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.

NOTE: Samples that are significantly above 10° C, at the time of collection, may need to be iced or refrigerated for a period of time, in order to chill them prior to shipping. This will allow them to be shipped with sufficient ice to meet the above requirements.

6.4 Sample Handling

6.4.1 Holding Times

6.4.1.1 Water samples should be extracted as soon as possible but must be extracted within 14 days. Extracts must be stored at room temperature and analyzed within 28 days after extraction.

7. Equipment and Supplies

7.1 SAMPLE CONTAINERS – 250-mL high density polyethylene (HDPE) bottles fitted with unlined screw caps. Sample bottles must be discarded after use.

7.2 POLYPROPYLENE BOTTLES – 4-mL narrow-mouth polypropylene bottles.

7.3 CENTRIFUGE TUBES – 15-mL conical polypropylene tubes with polypropylene screw caps for storing standard solutions and for collection of the extracts.

7.4 AUTOSAMPLER VIALS – Polypropylene 0.7-mL autosampler vials with polypropylene caps.

7.4.1 NOTE: Polypropylene vials and caps are necessary to prevent contamination of the sample from PTFE coated septa. However, polypropylene caps do not reseal, so evaporation occurs after injection. Thus, multiple injections from the same vial are not possible.

7.5 POLYPROPYLENE GRADUATED CYLINDERS – Suggested sizes include 25, 50, 100 and 1000-mL cylinders.

7.6 MICRO SYRINGES – Suggested sizes include 5, 10, 25, 50, 100, 250, 500 and 1000-µL syringes.

7.7 PLASTIC PIPETS – Polypropylene or polyethylene disposable pipets.

7.8 ANALYTICAL BALANCE – Capable of weighing to the nearest 0.0001 g.

7.9 SOLID PHASE EXTRACTION (SPE) APPARATUS FOR USING CARTRIDGES

7.9.1 SPE CARTRIDGES – 0.5 g, 6-mL SPE cartridges containing styrenedivinylbenzene (SDVB) sorbent phase.

7.9.2 VACUUM EXTRACTION MANIFOLD – A manual vacuum manifold with large volume sampler for cartridge extractions, or an automatic/robotic sample preparation system designed for use with SPE cartridges, may be used if all QC requirements discussed in Section 9 are met. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. Care must be taken with automated SPE systems to ensure the PTFE commonly used in these systems does not contribute to unacceptable analyte concentrations in the MB (Sect. 9.2.1).

7.9.3 SAMPLE DELIVERY SYSTEM – Use of a polypropylene transfer tube system, which transfers the sample directly from the sample container to the SPE cartridge, is recommended, but not mandatory. Standard extraction manifolds come equipped with PTFE transfer tube systems. These can be replaced with 1/8” O.D. x 1/16” I.D. polypropylene or polyethylene tubing cut to an appropriate length to ensure no sample contamination from the sample transfer lines. Other types of non-PTFE tubing may be used provided it meets the MB (Sect. 9.2.1)

and LCS (Sect. 9.3) QC requirements. The PTFE transfer tubes may be used, but an MB must be run on each PFTE transfer tube and the QC requirements in Section 13.2.2 must be met. In the case of automated SPE, the removal of PTFE lines may not be feasible; therefore, MBs will need to be rotated among the ports and must meet the QC requirements of Sections 13.2.2 and 9.2.1.

7.10 EXTRACT CONCENTRATION SYSTEM – Extracts are concentrated by evaporation with nitrogen using a water bath set no higher than 65 °C.

7.11 LABORATORY OR ASPIRATOR VACUUM SYSTEM – Sufficient capacity to maintain a vacuum of approximately 10 to 15 inches of mercury for extraction cartridges.

7.12 LIQUID CHROMATOGRAPHY (LC)/TANDEM MASS SPECTROMETER (MS/MS) WITH DATA SYSTEM

7.12.1 LC SYSTEM – Instrument capable of reproducibly injecting up to 10-µL aliquots, and performing binary linear gradients at a constant flow rate near the flow rate used for development of this method (0.3 mL/min). The LC must be capable of pumping the water/methanol mobile phase without the use of a degasser which pulls vacuum on the mobile phase bottle (other types of degassers are acceptable). Degassers which pull vacuum on the mobile phase bottle will volatilize the ammonium acetate mobile phase causing the analyte peaks to shift to earlier retention times over the course of the analysis batch. The usage of a column heater is optional.

NOTE: During the course of method development, it was discovered that while idle for more than one day, PFASs built up in the PTFE solvent transfer lines. To prevent long delays in purging high levels of PFASs from the LC solvent lines, they were replaced with PEEK tubing and the PTFE solvent frits were replaced with stainless steel frits. It is not possible to remove all PFAS background contamination, but these measures help to minimize their background levels.

7.12.2 LC/TANDEM MASS SPECTROMETER – The LC/MS/MS must be capable of negative ion electrospray ionization (ESI) near the suggested LC flow rate of 0.3 mL/min. The system must be capable of performing MS/MS to produce unique product ions for the method analytes within specified retention time segments. A minimum of 10 scans across the chromatographic peak is required to ensure adequate precision.

7.12.3 DATA SYSTEM – An interfaced data system is required to acquire, store, reduce, and output mass spectral data. The computer software should have the capability of processing stored LC/MS/MS data by recognizing an LC peak within any given retention time window. The software must allow integration of the ion abundance of any specific ion within specified time or scan number limits. The software must be able to calculate relative response factors, construct linear regressions or quadratic calibration curves, and calculate analyte concentrations.

7.12.4 ANALYTICAL COLUMN – An LC C_{18} column (2.1 x 150 mm) packed with 5 µm d_p C_{18} solid phase particles was used. Any column that provides adequate resolution, peak shape, capacity, accuracy, and precision (Sect. 9) may be used.

8. Reagents and Standards

8.1 GASES, REAGENTS, AND SOLVENTS – Reagent grade or better chemicals should be used.

8.1.1 REAGENT WATER – Purified water which does not contain any measurable quantities of any method analytes or interfering compounds greater than 1/3 the RL for each method analyte of interest. Prior to daily use, at least 3 L of reagent water should be flushed from the purification system to rinse out any build-up of analytes in the system's tubing.

8.1.2 METHANOL (CH_3OH, CAS#: 67-56-1) – High purity, demonstrated to be free of analytes and interferences.

8.1.3 AMMONIUM ACETATE ($NH_4C_2H_3O_2$, CAS#: 631-61-8) – High purity, demonstrated to be free of analytes and interferences.

8.1.4 2 mM AMMONIUM ACETATE/REAGENT WATER – To prepare 1 L, add .154 g ammonium acetate to 1 L of reagent water. This solution is prone to volatility losses and should be replaced at least every 48 hours.

8.1.5 TRIZMA PRESET CRYSTALS, pH 7.0 – Reagent grade. A premixed blend of Tris [Tris(hydroxymethyl)aminomethane] and Tris HCL [Tris(hydroxymethyl)aminomethane hydrochloride]. Alternatively, a mix of the two components with a weight ratio of 15.5/1 Tris HCL/Tris may be used. These blends are targeted to produce a pH near 7.0 at 25 °C in reagent water. Trizma functions as a buffer, and removes free chlorine in chlorinated finished waters (Sect. 6.2.1).

8.1.6 NITROGEN – Used for the following purposes: Nitrogen aids in aerosol generation of the ESI liquid spray and is used as collision gas in some MS/MS instruments. The nitrogen used should meet or exceed instrument manufacturer's specifications. In addition, Nitrogen is used to concentrate sample extracts (Ultra High Purity or equivalent).

8.1.7 ARGON – Used as collision gas in MS/MS instruments. Argon should meet or exceed instrument manufacturer's specifications. Nitrogen gas may be used as the collision gas provided sufficient sensitivity (product ion formation) is achieved.

8.2 STANDARD SOLUTIONS – When a compound purity is assayed to be 96% or greater, the weight can be used without correction to calculate the concentration of the stock standard. PFAS analyte, IS and SUR standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers. Standards for sample fortification generally should be prepared in the smallest volume that can be accurately measured to minimize the addition of excess organic solvent to aqueous samples.

NOTE: Stock standards (Sect. 8.2.1, 8.2.3 and 8.2.5) are stored at ≤4 °C. Primary dilution standards (Sect. 8.2.2 and 8.2.4) are stored at room temperature to prevent adsorption of the method analytes onto the container surfaces that may occur when refrigerated. Storing the standards at room temperature will also minimize daily imprecision due to the potential of inadequate room temperature stabilization.

8.2.1 IS STOCK STANDARD SOLUTIONS - IS stock standard solutions are stable for at least 6 months when stored at 4 °C. The stock solution is purchased at a concentration range of 1-4 ng/µl.

8.2.2 INTERNAL STANDARD PRIMARY DILUTION (IS PDS) STANDARD (0.5-2 ng/µL) – Prepare the IS PDS at a concentration of 0.5-2 ng/µL. The IS PDS is prepared in 96:4% (vol/vol) methanol:water. The IS PDS is stable for at least two months when stored in polypropylene centrifuge tubes at room temperature.

Table 3

Internal Standard	Conc. of IS Stock (ng/uL)	Vol. of IS Stock (mL)	Final Vol. of IS PDS (mL)	Final Conc. of IS PDS (ng/µL)
^{13}C-PFOA	1	1.0	2.0	0.5
^{13}C-PFOS	3	1.0	2.0	1.5
d_3-NMeFOSAA	4	1.0	2.0	2.0

8.2.3 SUR STOCK STANDARD SOLUTIONS – SUR stock standard solutions are stable for at least 6 months when stored at 4 °C.

8.2.4 SURROGATE PRIMARY DILUTION STANDARD (SUR PDS) (0.5-2 ng/µL) – Prepare the SUR PDS at a concentration of 0.5-2 ng/µL. The SUR PDS is prepared in 96:4% (vol/vol) methanol:water. This solution is used to fortify all QC and Field Samples. The PDS is stable for one year when stored in polypropylene centrifuge tubes at room temperature.

Table 4

Surrogate	Conc. of SUR Stock (ng/µL)	Vol. of SUR Stock (mL)	Final Vol. of SUR PDS (,L)	Final Conc. of SUR PDS (ng/µL)
^{13}C-PFHxA	1.0	1.0	2.0	0.5
^{13}C-PFDA	1.0	1.0	2.0	0.5
d_5-NEtFOSAA	4.0	1.0	2.0	2.0
Tetrafluoro-2-heptafluoropropoxy-$^{13}C_3$-propanoic acid[1]	50	1.0	2.0	0.5

[1] EPA 537.1 Surrogate only

8.2.5 ANALYTE STOCK STANDARD SOLUTION – Analyte stock standards are stable for at least 6 months when stored at -15 °C. When using these stock standards to prepare a PDS, care must be taken to ensure that these standards are at room temperature and adequately vortexed.

Table 5

Analyte	Analyte Stock Solvent	Concentration (ug/mL)
PFHxA	100% methanol	1.0
PFHpA	100% methanol	1.0
PFOA	100% methanol	1.0
PFNA	100% methanol	1.0
PFDA	100% methanol	1.0
PFUnA	100% methanol	1.0
PFDoA	100% methanol	1.0

PFTrDA	100% methanol	1.0
PFTA	100% methanol	1.0
PFBS	100% methanol	1.0

Table 5 (cont.)

Analyte	Analyte Stock Solvent	Concentration (ug/mL)
PFHxS	100% methanol	1.0
PFOS	100% methanol	1.0
NEtFOSAA	100% methanol	1.0
NMeFOSAA	100% methanol	1.0
HFPO-DA	100% methanol	50.0
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	100% methanol	50.0
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	100% methanol	50.0
4,8-dioxa-3H-perfluorononanoic acid	100% methanol	50.0

8.2.6 LOW, MEDIUM AND HIGH LEVEL LCS – The LCS's will be prepared at the following concentrations and rotated per batch; 2 ng/L, 40 ng/L, 500 ng/l. The analyte PDS contains all the method analytes of interest at various concentrations in methanol containing 4% water. The analyte PDS has been shown to be stable for 6 months when stored at room temperature.

8.2.7 CALIBRATION STANDARDS (CAL) –

Current Concentrations (ng/mL): 0.5, 1.0, 5.0, 10.0, 50.0, 125 and 150 (optional)

Prepare the CAL standards over the concentration range of interest from dilutions of the analyte PDS in methanol containing 4% reagent water. The IS and SUR are added to the CAL standards at a constant concentration (10-40 ng/L). The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity. The CAL standards may also be used as CCVs (Sect. 9.9). The CAL standards are stable for at least two weeks when stored at room temperature. Longer storage times are acceptable provided appropriate QC measures are documented demonstrating the CAL standard stability.

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 REPORTING LIMIT (RL) CONFIRMATION

9.1.1 Fortify, extract, and analyze seven replicate LCSs at 2 ng/l. These LCSs must contain all method preservatives described in Section 6.2.1. Calculate the mean measured concentration (*Mean*) and standard deviation for these replicates. Determine the Half Range for the prediction interval of results (HR_{PIR}) using the equation below

$$HR_{PIR} = 3.963s$$

Where:

s = the standard deviation

3.963 = a constant value for seven replicates.

9.1.2 Confirm that the upper and lower limits for the Prediction Interval of Result (*PIR* = *Mean* ± HR_{PIR}) meet the upper and lower recovery limits as shown below

The Upper PIR Limit must be ≤150% recovery.

$$\frac{Mean + HR_{PIR}}{Fortified\ Concentration} \times 100\% \leq 150\%$$

The Lower PIR Limit must be ≥ 50% recovery.

$$\frac{Mean - HR_{PIR}}{Fortified\ Concentration} \times 100\% \geq 50\%$$

9.1.3 The RL is validated if both the Upper and Lower PIR Limits meet the criteria described above. If these criteria are not met, the RL has been set too low and must be determined again at a higher concentration.

9.2 Blank(s)

9.2.1 **METHOD BLANK (MB) -** A Method Blank (MB) is required with each extraction batch to confirm that potential background contaminants are not interfering with the identification or quantitation of method analytes. If more than 20 Field Samples are included in a batch, analyze an MB for every 20 samples. If the MB produces a peak within the retention time window of any analyte that would prevent the determination of that analyte, determine the source of contamination and eliminate the interference before processing samples. Background contamination must be reduced to an acceptable level before proceeding. Background from method analytes or other contaminants that interfere with the measurement of method analytes must be below 1/3 of the RL. Blank contamination is estimated by extrapolation, if the concentration is below the lowest CAL standard. This extrapolation procedure is not allowed for sample results as it may not meet data quality objectives. If the method analytes are detected in the MB at concentrations equal to or greater than this level, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch. Because background contamination is a significant problem for several method analytes, it is highly recommended that the analyst maintain a historical record of MB data.

9.2.2 **FIELD REAGENT BLANK (FRB)** - The purpose of the FRB is to ensure that PFASs measured in the Field Samples were not inadvertently introduced into the sample during sample collection/handling. Analysis of the FRB is required only if a Field Sample contains a method analyte or analytes at or above the RL. The FRB is processed, extracted and analyzed in exactly the same manner as a Field Sample. If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the RL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed.

9.3 Laboratory Control Sample (LCS)

9.3.1 An LCS is required with each extraction batch. The fortified concentration of the LCS must be rotated between low, medium, and high concentrations from batch to batch.

9.3.2 The low concentration LCS must be as near as practical to, but no more than two times, the RL. Similarly, the high concentration LCS should be near the high end of the calibration range established during the initial calibration (Sect. 10.6).

9.3.3 Results of the low-level LCS analyses must be 50-150% of the true value. Results of the medium and high-level LCS analyses must be 70-130% of the true value. If the LCS results do not meet these criteria for method analytes, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch.

9.3.4 It is the responsibility of the extraction chemist to view the previous extraction batch to determine the next spiking concentration. (Low → Medium → High)

9.4 Internal Standards (IS)

The analyst must monitor the peak areas of the IS(s) in all injections during each analysis day. The IS responses (peak areas) in any chromatographic run must be within 70-140% of the response in the most recent CCV and must not deviate by more than 50% from the average area measured during initial analyte calibration. If the IS areas in a chromatographic run do not meet these criteria, inject a second aliquot of that extract aliquoted into a new capped autosampler vial. Random evaporation losses have been observed with the polypropylene caps causing high IS(s) areas.

9.4.1 If the reinjected aliquot produces an acceptable IS response, report results for that aliquot.

9.4.2 If the reinjected extract fails again, the analyst should check the calibration by reanalyzing the most recently acceptable CAL standard. If the CAL standard fails the criteria of Section 9.9, recalibration is in order per Section 10.6. If the CAL standard is acceptable, extraction of the sample may need to be repeated provided the sample is still within the holding time. Otherwise, report results obtained from the reinjected extract, but annotate as suspect. Alternatively, collect a new sample and re-analyze.

9.5 Surrogate Recovery

The SUR standard is fortified into all samples, CCVs, MBs, LCSs, MSs, MSDs, FD, and FRB prior to extraction. It is also added to the CAL standards. The SUR is a means of assessing method performance from extraction to final chromatographic measurement. Calculate the recovery (%R) for the SUR using the following equation

$$\%R = (A / B) \times 100$$

Where:

A = calculated SUR concentration for the QC or Field Sample
B = fortified concentration of the SUR.

9.5.1.1 SUR recovery must be in the range of 70-130%. When SUR recovery from a sample, blank, or CCV is less than 70% or greater than 130%, check 1) calculations to locate possible errors, 2) standard solutions for degradation, 3) contamination, and 4) instrument performance. Correct the problem and reanalyze the extract.

9.5.1.2 If the extract reanalysis meets the SUR recovery criterion, report only data for the reanalyzed extract.

9.5.1.3 If the extract reanalysis fails the 70-130% recovery criterion, the analyst should check the calibration by injecting the last CAL standard that passed. If the CAL standard fails the criteria of Section 10.7, recalibration is in order per Section 10.6. If the CAL standard is acceptable, extraction of the sample should be repeated provided the sample is still within the holding time. If the re-extracted sample also fails the recovery criterion, report all data for that sample as suspect/SUR recovery to inform the data user that the results are suspect due to SUR recovery. Alternatively, collect a new sample and re-analyze.

9.6 Matrix Spike (MS)

9.6.1 Analysis of an MS is required in each extraction batch and is used to determine that the sample matrix does not adversely affect method accuracy. Assessment of method precision is accomplished by analysis of a Field Duplicate (FD) (Sect. 9.7); however, infrequent occurrence of method analytes would hinder this assessment. If the occurrence of method analytes in the samples is infrequent, or if historical trends are unavailable, a second MS, or MSD, must be prepared, extracted, and analyzed from a duplicate of the Field Sample. Extraction batches that contain MSDs will not require the extraction of a field sample duplicate. If a variety of different sample matrices are analyzed regularly, for example, drinking water from groundwater and surface water sources, method performance should be established for each. Over time, MS data should be documented by the laboratory for all routine sample sources.

9.6.2 Within each extraction batch, a minimum of one Field Sample is fortified as an MS for every 20 Field Samples analyzed. The MS is prepared by spiking a sample with an appropriate amount of the Analyte Stock Standard (Sect. 8.2.5). Use historical data and rotate through the low, mid and high concentrations when selecting a fortifying concentration. Calculate the percent recovery (%*R*) for each analyte using the equation

$$\%R = \frac{(A - B)}{C} \times 100$$

Where:

A = measured concentration in the fortified sample
B = measured concentration in the unfortified sample
C = fortification concentration.

9.6.3 Analyte recoveries may exhibit matrix bias. For samples fortified at or above their native concentration, recoveries should range between 70-130%, except for low-level fortification near or at the RL (within a factor of 2-times the RL concentration) where 50-150% recoveries are acceptable. If the accuracy of any analyte falls outside the designated range, and the laboratory performance for

that analyte is shown to be in control in the CCVs, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7 Laboratory Duplicate

9.7.1 FIELD DUPLICATE OR LABORATORY FORTIFIED SAMPLE MATRIX DUPLICATE (FD or MSD) – Within each extraction batch (not to exceed 20 Field Samples), a minimum of one FD or MSD must be analyzed. Duplicates check the precision associated with sample collection, preservation, storage, and laboratory procedures. If method analytes are not routinely observed in Field Samples, an MSD should be analyzed rather than an FD.

9.7.2 Calculate the relative percent difference (*RPD*) for duplicate measurements (*FD1* and *FD2*) using the equation

$$RPD = \frac{|FD1 - FD2|}{(FD1 + FD2) / 2} \times 100$$

9.7.3 RPDs for FDs should be ≤30%. Greater variability may be observed when FDs have analyte concentrations that are within a factor of 2 of the RL. At these concentrations, FDs should have RPDs that are ≤50%. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the CCV, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7.4 If an MSD is analyzed instead of a FD, calculate the relative percent difference (RPD) for duplicate MSs (MS and MSD) using the equation

$$RPD = \frac{|MS - MSD|}{(MS + MSD) / 2} \times 100$$

9.7.5 RPDs for duplicate MSs should be ≤30% for samples fortified at or above their native concentration. Greater variability may be observed when MSs are fortified at analyte concentrations that are within a factor of 2 of the RL. MSs fortified at these concentrations should have RPDs that are ≤50% for samples fortified at or above their native concentration. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the CCV, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.8 Initial Calibration Verification (ICV)

9.8.1 As part of the IDC (Sect. 13.2), each time a new Analyte Stock Standard solution (Sect. 8.2.5) is used, and at least quarterly, analyze a QCS sample from a source different from the source of the CAL standards. If a second vendor is not available, then a different lot of the standard should be used. The QCS should be prepared and analyzed just like a CCV. Acceptance criteria for the QCS are identical to the CCVs; the calculated amount for each analyte must be ± 30% of the expected value. If measured analyte concentrations are not of acceptable

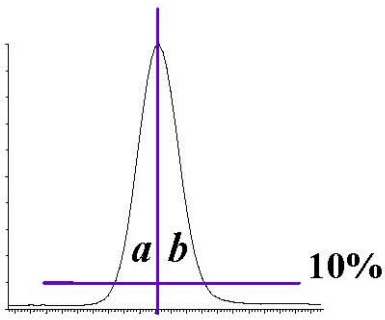
accuracy, check the entire analytical procedure to locate and correct the problem.

9.9 Continuing Calibration Verification (CCV)

9.9.1 CCV Standards are analyzed at the beginning of each analysis batch, after every 10 Field Samples, and at the end of the analysis batch. See Section 10.7 for concentration requirements and acceptance criteria.

9.10 Method-specific Quality Control Samples

9.10.1 PEAK ASYMMETRY FACTOR – A peak asymmetry factor must be calculated using the equation below during the IDL and every time a calibration curve is generated. The peak asymmetry factor for the first two eluting peaks in a midlevel CAL standard (if only two analytes are being analyzed, both must be evaluated) must fall in the range of 0.8 to 1.5. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.



$$A_s = b / a$$

Where:

A_s = peak asymmetry factor
b = width of the back half of the peak measured (at 10% peak height) from the trailing edge of the peak to a line dropped perpendicularly from the peak apex
a = the width of the front half of the peak measured (at 10% peak height) from the leading edge of the peak to a line dropped perpendicularly from the apex.

9.11 Method Sequence

ICV

CCV-LOW

MB

LCS

LCSD

MS

Duplicate or MSD

Field Samples (1-10)

CCV-MID

Field Samples (11-20)

CCV-HIGH

10. Procedure

10.1 Equipment Set-up

10.1.1 This procedure may be performed manually or in an automated mode using a robotic or automatic sample preparation device. If an automated system is used to prepare samples, follow the manufacturer's operating instructions, but all extraction and elution steps must be the same as in the manual procedure. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. If an automated system is used, the MBs should be rotated among the ports to ensure that all the valves and tubing meet the MB requirements (Sect. 9.2).

10.1.2 Some of the PFASs adsorb to surfaces, including polypropylene. Therefore, the aqueous sample bottles must be rinsed with the elution solvent (Sect 10.3.4) whether extractions are performed manually or by automation. The bottle rinse is passed through the cartridge to elute the method analytes and is then collected (Sect. 10.3.4).

10.1.3 **NOTE:** The SPE cartridges and sample bottles described in this section are designed as single use items and should be discarded after use. They may not be refurbished for reuse in subsequent analyses.

10.2 Sample Preparation

10.2.1 Samples are preserved, collected and stored as presented in Section 6. All Field and QC Samples, including the MB, LCS and FRB, must contain the dechlorinating agent listed in Section 6.2.1. Determine sample volume. An indirect measurement may be done in one of two ways: by marking the level of the sample on the bottle or by weighing the sample and bottle to the nearest 10 g. After extraction, proceed to Section 10.5 for final volume determination. Some of the PFASs adsorb to surfaces, thus the sample volume may **NOT** be transferred to a graduated cylinder for volume measurement. The MB, LCS and FRB may be prepared by measuring 250 mL of reagent water with a polypropylene graduated cylinder or filling a 250-mL sample bottle to near the top.

The entire sample that is received must be sent through the SPE cartridge. In addition, the bottle must be solvent rinsed and this rinse must be sent through the SPE cartridge as well. The method blank (MB) and laboratory control sample (LCS) must be extracted in exactly the same manner (i.e., must include the bottle solvent rinse). It should be noted that a water rinse alone is not sufficient. This does not apply to samples with high concentrations of PFAS that are prepared using serial dilution and not SPE.

10.2.2 Add 20 µL of the SUR PDS (Sect. 8.2.4) to each sample, cap and invert to mix for a final concentration of 10 ng/L for ^{13}C-PFHxA and ^{13}C-PFDA and 40 ng/L for d_5-NEtFOSAA.

10.2.3 In addition to the SUR(s) and dechlorination agent, if the sample is an LCS, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.5). Cap and invert each sample to mix.

10.3 Cartridge SPE Procedure

10.3.1 CARTRIDGE CLEAN-UP AND CONDITIONING – DO NOT allow cartridge packing material to go dry during any of the conditioning steps. Rinse each cartridge with 15 mL of methanol. Next, rinse each cartridge with 18 mL of reagent water, without allowing the water to drop below the top edge of the packing. If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Add 4-5 mL of reagent water to each cartridge, attach the sample transfer tubes (Sect. 7.2.3), turn on the vacuum, and begin adding sample to the cartridge.

10.3.2 SAMPLE EXTRACTON – Adjust the vacuum so that the approximate flow rate is 10-15 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.3.3 SAMPLE BOTTLE AND CARTRIDGE RINSE – After the entire sample has passed through the cartridge, rinse the sample bottles with two 7.5-mL aliquots of reagent water and draw each aliquot through the sample transfer tubes and the cartridges. Draw air or nitrogen through the cartridge for 5 min at high vacuum (10-15 in. Hg).

NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the entire sample has passed through the cartridge, the reservoirs must be rinsed to waste with reagent water.

10.3.4 SAMPLE BOTTLE AND CARTRIDGE ELUTION – Turn off and release the vacuum. Lift the extraction manifold top and insert a rack with collection tubes into the extraction tank to collect the extracts as they are eluted from the cartridges. Rinse the sample bottles with 4 mL of methanol and elute the analytes from the cartridges by pulling the 4 mL of methanol through the sample transfer tubes and the cartridges. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion. Repeat sample bottle rinse and cartridge elution with a second 4-mL aliquot of methanol.

NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the reservoirs have been rinsed in Section 10.3.3, the elution solvent used to rinse the sample bottles must be swirled down the sides of the reservoirs while eluting the cartridge to ensure that any method analytes on the surface of the reservoirs are transferred to the extract.

10.4 Extract Concentration

10.4.1 Concentrate the extract to dryness under a gentle stream of nitrogen in a heated water bath (60-65 °C) to remove all the water/methanol mix. Add the appropriate amount of 96:4% (vol/vol) methanol:water solution and the IS PDS (Sect. 8.2.2) to the collection vial to bring the volume to 1 mL and vortex. Transfer a small aliquot with a plastic pipet (Sect. 7.6) to a polypropylene autosampler vial.

NOTE: It is recommend that the entire 1-mL aliquot not be transferred to the autosampler vial because the polypropylene autosampler caps do not reseal after injection. Therefore, do not store the extracts in the

autosampler vials as evaporation losses can occur occasionally in these autosampler vials. Extracts can be stored in 15-mL centrifuge tubes (Sect. 7.3).

10.5 Sample Volume Determination

10.5.1 If the level of the sample was marked on the sample bottle, use a graduated cylinder to measure the volume of water required to fill the original sample bottle to the mark made prior to extraction. Determine to the nearest 10 mL. If using weight to determine volume, weigh the empty bottle to the nearest 10 g and determine the sample weight by subtraction of the empty bottle weight from the original sample weight (Sect. 10.2.1). Assume a sample density of 1.0 g/mL. In either case, the sample volume will be used in the final calculations of the analyte concentration (Sect. 11.2).

10.6 Initial Calibration - Demonstration and documentation of acceptable initial calibration is required before any samples are analyzed. After the initial calibration is successful, a CCV is required at the beginning and end of each period in which analyses are performed, and after every tenth Field Sample.

10.6.1 ESI-MS/MS TUNE

10.6.1.1 Calibrate the mass scale of the MS with the calibration compounds and procedures prescribed by the manufacturer.

10.6.1.2 Optimize the [M-H]- for each method analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.3 mL/min). This tune can be done on a mix of the method analytes. The MS parameters (voltages, temperatures, gas flows, etc.) are varied until optimal analyte responses are determined. The method analytes may have different optima requiring some compromise between the optima.

10.6.1.3 Optimize the product ion for each analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.4 mL/min). This tune can be done on a mix of the method analytes. The MS/MS parameters (collision gas pressure, collision energy, etc.) are varied until optimal analyte responses are determined. Typically, the carboxylic acids have very similar MS/MS conditions and the sulfonic acids have similar MS/MS conditions.

10.6.2 Establish LC operating parameters that optimize resolution and peak shape. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

Cautions: LC system components, as well as the mobile phase constituents, contain many of the method analytes in this method. Thus, these PFASs will build up on the head of the LC column during mobile phase equilibration. To minimize the background PFAS peaks and to keep background levels constant, the time the LC column sits at initial conditions must be kept constant and as short as possible (while ensuring reproducible retention times). In addition, prior to daily use, flush the column with 100% methanol for at least 20 min before initiating a sequence. It may be necessary on some systems to flush other LC components such as wash

syringes, sample needles or any other system components before daily use.

Mobile phase modifiers other than 20 mM ammonium acetate may be used at the discretion of the analyst, provided that the retention time stability criteria in Sect. 10.9.2 can be met over a period of two weeks. During method development, retention times shifted to shorter and shorter times as days progressed when mobile phases with less than 20 mM ammonium acetate were used.

10.6.3 Inject a mid-level CAL standard under LC/MS conditions to obtain the retention times of each method analyte. If analyzing for PFTA, ensure that the LC conditions are adequate to prevent co-elution of PFTA and the mobile phase interferants. These interferants have the same precursor and products ions as PFTA, and under faster LC conditions may co-elute with PFTA. Divide the chromatogram into retention time windows each of which contains one or more chromatographic peaks. During MS/MS analysis, fragment a small number of selected precursor ions ([M-H]-) for the analytes in each window and choose the most abundant product ion. For maximum sensitivity, small mass windows of ±0.5 daltons around the product ion mass were used for quantitation. If sufficient sensitivity exists to meet the RL, wider mass ranges may be used to obtain more confirmation ions.

10.6.3.1 As recommended by the EPA Advisory on September 2016, both linear and branched isomers should be included in the quantitation. NOTE: As the NOTE in Section 10.6.4.1 indicates, PFOS has linear and branched isomers. There have been reports that not all the products ions in the linear PFOS are produced in all the branched PFOS isomers. (This phenomenon probably exists for PFHxS and PFBS also, although it has not been studied to date.) Thus, in an attempt to reduce PFOS bias, it is required that the *m/z* 499 → *m/z* 80 transition be used as the quantitation transition. Some MS/MS instruments, such as conventional ion traps, may not be able to scan a product ion with such a wide mass difference from the precursor ion; therefore, they may not be used for this method if PFOS, PFBS, or PFHxS analysis is to be conducted. Literature reports indicate for the most abundant PFOS isomer, which is the linear isomer, that all the products ions obtained on an ion trap have less than 10% relative abundance. In addition, there is not a single ion trap MS/MS transition that encompasses the linear isomer and the majority of the branch isomers; thus, the bias would be unacceptably high.

10.6.4 Inject a mid-level CAL standard under optimized LC/MS/MS conditions to ensure that each method analyte is observed in its MS/MS window and that there are at least 10 scans across the peak for optimum precision.

10.6.4.1 If broad, split or fronting peaks are observed for the first two eluting chromatographic peaks (if only two analytes are being analyzed, both must be evaluated), change the initial mobile phase conditions to higher aqueous content until the peak asymmetry ratio for each peak is 0.8 – 1.5. The peak asymmetry factor is calculated as described in Section 9.10.1 on a mid-level CAL standard. The peak asymmetry factor must meet the above criteria for the first two eluting peaks during the IDL and every time a new calibration curve is generated. Modifying the standard

or extract composition to more aqueous content to prevent poor shape is not permitted.

NOTE: PFHxS, PFOS, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to chromatographic resolution of the linear and branched isomers of these compounds. According to the EPA Advisory, September 2016, the branched isomers are identified by analyzing a qualitative/semi-qualitative mixed PFOA standard and the quantitation of PFOA is accomplished by integration the total response which includes peaks identified as linear and branched isomers. Most PFASs are produced by two different processes. One process gives rise to linear PFASs only while the other process produces both linear and branched isomers. Thus, both branched and linear PFASs can potentially be found in the environment. For the aforementioned compounds that give rise to more than one peak, all the chromatographic peaks observed in the standard must be integrated and the areas totaled. Chromatographic peaks in a sample must be integrated in the same way as the CAL standard.

10.6.5 Prepare a set of CAL standards as described in Section 8.2.7. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity. It is recommended that at least four of the CAL standards are at a concentration greater than or equal to the RL.

10.6.6 The LC/MS/MS system is calibrated using the IS technique. Use the LC/MS/MS data system software to generate a linear regression or quadratic calibration curve for each of the analytes. This curve **must always** be forced through zero and may be concentration weighted, if necessary. Forcing zero allows for a better estimate of the background levels of method analytes.

10.6.6.1 The isotopically labeled IS(s) in this method may undergo suppression in the ESI source if the concentration of the co-eluting unlabeled method analyte(s) is too high. The analyte concentration at which suppression may occur can vary depending on the instrument, LC conditions, ESI conditions, IS concentration, etc. To evaluate whether suppression is occurring during calibration, calculate the relative percent difference (*RPD*) between the high (H) and low (L) areas for each IS using the equation

$$RPD = \frac{(H - L)}{(H + L) / 2} \times 100$$

10.6.6.2 The RPD calculated above must be <20% for each IS during calibration. If the calculated RPD is >20% for any IS, the analyst must recalibrate at lower analyte concentrations until the IS RPDs are <20%.

10.6.7 CALIBRATION ACCEPTANCE CRITERIA – When quantitated using the initial calibration curve, each calibration point, except the lowest point, for each analyte should calculate to be within 70-130% of its true value. The lowest CAL point should calculate to be within 50-150% of its true value. If these criteria cannot be met, the analyst will have difficulty meeting ongoing QC criteria. It is recommended that corrective action is taken to reanalyze the CAL standards, restrict the range of calibration, or select an alternate method of calibration (forcing the curve through zero is still required).

10.6.7.1 CAUTION: When acquiring MS/MS data, LC operating conditions must be carefully reproduced for each analysis to provide reproducible retention times. If this is not done, the correct ions will not be monitored at the appropriate times. As a precautionary measure, the chromatographic peaks in each window must not elute too close to the edge of the segment time window.

10.7 CONTINUING CALIBRATION CHECK (CCV) – Minimum daily calibration verification is as follows. Verify the initial calibration at the beginning and end of each group of analyses, and after every tenth sample during analyses. In this context, a "sample" is considered to be a Field Sample. MBs, CCVs, LCSs, MSs, FDs FRBs and MSDs are not counted as samples. The beginning CCV of each analysis batch must be at or below the RL in order to verify instrument sensitivity prior to any analyses. If standards have been prepared such that all low CAL points are not in the same CAL solution, it may be necessary to analyze two CAL standards to meet this requirement. Alternatively, the analyte concentrations in the analyte PDS may be customized to meet this criterion. Subsequent CCVs should alternate between a medium and high concentration CAL standard.

10.7.1 Inject an aliquot of the appropriate concentration CAL standard and analyze with the same conditions used during the initial calibration.

10.7.2 Determine that the absolute areas of the quantitation ions of the IS(s) are within 70-140% of the areas measured in the most recent continuing calibration check, and within 50-150% from the average areas measured during initial calibration. If any of the IS areas has changed by more than these amounts, adjustments must be made to restore system sensitivity. These adjustments may include cleaning of the MS ion source, or other maintenance as indicated in Section 10.7.4. Major instrument maintenance requires recalibration (Sect 10.6) and verification of sensitivity by analyzing a CCV at or below the RL (Sect 10.7). Control charts are useful aids in documenting system sensitivity changes.

10.7.3 Calculate the concentration of each analyte and SUR in the CCV. The calculated amount for each analyte and SUR for medium and high level CCVs must be within ± 30% of the true value. The calculated amount for the lowest calibration point for each analyte must be within ± 50% and the SUR must be within ± 30% of the true value. If these conditions do not exist, then all data for the problem analyte must be considered invalid, and remedial action should be taken (Sect. 10.7.4) which may require recalibration. Any Field or QC Samples that have been analyzed since the last acceptable calibration verification should be reanalyzed after adequate calibration has been restored, with the following exception. **If the CCV fails because the calculated concentration is greater than 130% (150% for the low-level CCV) for a particular method analyte, and Field Sample extracts show no detection for that method analyte, non-detects may be reported without re-analysis.**

10.7.4 REMEDIAL ACTION – Failure to meet CCV QC performance criteria may require remedial action. Major maintenance, such as cleaning the electrospray probe, atmospheric pressure ionization source, cleaning the mass analyzer, replacing the LC column, etc., requires recalibration (Sect 10.6) and verification of sensitivity by analyzing a CCV at or below the RL (Sect 10.7).

10.8 EXTRACT ANALYSIS

10.8.1 Establish operating conditions equivalent to those summarized in Tables 5-8 of Section 16. Instrument conditions and columns should be optimized prior to the initiation of the IDC.

10.8.2 Establish an appropriate retention time window for each analyte. This should be based on measurements of actual retention time variation for each method analyte in CAL standard solutions analyzed on the LC over the course of time. A value of plus or minus three times the standard deviation of the retention time obtained for each method analyte while establishing the initial calibration and completing the IDC can be used to calculate a suggested window size. However, the experience of the analyst should weigh heavily on the determination of the appropriate retention window size.

10.8.3 Calibrate the system by either the analysis of a calibration curve (Sect. 10.6) or by confirming the initial calibration is still valid by analyzing a CCV as described in Section 10.7. If establishing an initial calibration, complete the IDC as described in Section 13.2.

10.8.4 Begin analyzing Field Samples, including QC samples, at their appropriate frequency by injecting the same size aliquots, under the same conditions used to analyze the CAL standards.

10.8.5 At the conclusion of data acquisition, use the same software that was used in the calibration procedure to identify peaks of interest in predetermined retention time windows. Use the data system software to examine the ion abundances of the peaks in the chromatogram. Identify an analyte by comparison of its retention time with that of the corresponding method analyte peak in a reference standard.

10.8.6 Comparison of the MS/MS mass spectra is not particularly useful given the limited ±0.5 dalton mass range around a single product ion for each method analyte.

10.8.7 The analyst must not extrapolate beyond the established calibration range. If an analyte peak area exceeds the range of the initial calibration curve, the extract may be diluted with 96%:4% vol/vol) methanol:water solution and the appropriate amount of IS added to match the original concentration. Re-inject the diluted extract. Incorporate the dilution factor into the final concentration calculations. Acceptable SUR performance (Sect. 9.5.1.1) should be determined from the undiluted sample extract. The resulting data should be documented as a dilution, with an increased RL.

11. Data Evaluation, Calculations and Reporting

11.1 Complete chromatographic resolution is not necessary for accurate and precise measurements of analyte concentrations using MS/MS. In validating this method, concentrations were calculated by measuring the product ions listed in Table 8. Other ions may be selected at the discretion of the analyst.

11.2 Calculate analyte and SUR concentrations using the multipoint calibration established in Section 10.6. Do not use daily calibration verification data to quantitate analytes in samples. Adjust final analyte concentrations to reflect the actual sample volume determined in Section 10.5.

11.3 Prior to reporting the data, the chromatogram should be reviewed for any incorrect peak identification or poor integration.

11.4 PFHxS, PFOS, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to the linear and branch isomers of these compounds (Sect. 10.6.4.1). The areas of all the linear and branched isomer peaks observed in the CAL standards for each of these analytes must be summed and the concentrations reported as a total for each of these analytes.

11.5 Calculations must utilize all available digits of precision, but final reported concentrations should be rounded to an appropriate number of significant figures (one digit of uncertainty), typically two, and not more than three significant figures.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

12.1 Section 9.0 outlines sample batch QC acceptance criteria. If non-compliant organic compound results are to be reported, the Organic Section Head and/or the Laboratory Director, and the Operations Manager must approve the reporting of these results. The laboratory Project Manager shall be notified, and may choose to relay the non-compliance to the client, for approval, or other corrective action, such as re-sampling and re-analysis. The analyst, Data Reviewer, or Department Supervisor performing the secondary review initiates the project narrative, and the narrative must clearly document the non-compliance and provide a reason for acceptance of these results.

12.2 All results for the organic compounds of interest are reportable without qualification if extraction and analytical holding times are met, preservation requirements (including cooler temperatures) are met, all QC criteria defined in the table below are met, and matrix interference is not suspected during extraction or analysis of the samples. If any of the below QC parameters are not met, all associated samples must be evaluated for re-extraction and/or re-analysis.

13. Method Performance

13.1 Detection Limit Study (DL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

13.1.1 The laboratory follows the procedure to determine the DL, LOD, and/or LOQ as outlined in Alpha SOP ID 1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

13.2.1 The IDC must be successfully performed prior to analyzing any Field Samples. Prior to conducting the IDC, the analyst must first generate an acceptable Initial Calibration following the procedure outlined in Section 10.6.

13.2.2 INITIAL DEMONSTRATION OF LOW SYSTEM BACKGROUND – Any time a new lot of SPE cartridges, solvents, centrifuge tubes, disposable pipets, and autosampler vials are used, it must be demonstrated that an MB is reasonably free of contamination and that the criteria in Section 9.2.1 are met. If an automated extraction system is used, an MB should be extracted on each port to ensure that all the valves and tubing are free from potential PFAS contamination.

13.2.3 INITIAL DEMONSTRATION OF PRECISION (IDP) – Prepare, extract, and analyze four to seven replicate LCSs fortified near the midrange of the initial calibration curve according to the procedure described in Section 10. Sample preservatives as described in Section 6.2.1 must be added to these samples. The relative standard deviation (RSD) of the results of the replicate analyses must be less than 20%.

13.2.4 INITIAL DEMONSTRATION OF ACCURACY (IDA) – Using the same set of replicate data generated for Section 13.2.3, calculate average recovery. The average recovery of the replicate values must be within ± 30% of the true value.

13.2.5 INITIAL DEMONSTRATION OF PEAK ASYMMETRY FACTOR – Peak asymmetry factors must be calculated using the equation in Section 9.10.1 for the first two eluting peaks (if only two analytes are being analyzed, both must be evaluated) in a mid-level CAL standard. The peak asymmetry factors must fall in the range of 0.8 to 1.5. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.

13.2.6 Refer to Alpha SOP ID 1739 for further information regarding IDC/DOC Generation.

13.2.7 The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

14.1 Refer to Alpha's Chemical Hygiene Plan and Hazardous Waste Management and Disposal SOP for further pollution prevention and waste management information.

14.2 This method utilizes SPE to extract analytes from water. It requires the use of very small volumes of organic solvent and very small quantities of pure analytes, thereby minimizing the potential hazards to both the analyst and the environment as compared to the use of large volumes of organic solvents in conventional liquid-liquid extractions.

14.3 The analytical procedures described in this method generate relatively small amounts of waste since only small amounts of reagents and solvents are used. The matrices of concern are finished drinking water or source water. However, laboratory waste management practices must be conducted consistent with all applicable rules and regulations, and that laboratories protect the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Also, compliance is required with any sewage discharge permits and regulations, particularly the hazardous waste identification rules and land disposal restrictions.

15. Referenced Documents

15.1 Chemical Hygiene Plan – ID 2124

15.2 SOP ID 1732 Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) SOP

15.3 SOP ID 1739 Demonstration of Capability (DOC) Generation SOP

15.4 SOP ID 1728 Hazardous Waste Management and Disposal SOP

16. Attachments

Table 6: LC Method Conditions

Time (min)	2 mM Ammonium Acetate (5:95 MeOH/H_2O)	2 mM Ammonium Acetate (100% Methanol)
Initial	100.0	0.0
1.0	100.0	0.0
2.2	85.0	15.0
11	20.0	80.0
11.4	0.0	100.0
12.4	100.0	0.0
14.0	100.0	0.0
Waters Aquity UPLC ® BEHC_{18} 2.1 x 50 mm packed with 1.7 µm BEH C_{18} stationary phase Flow rate of 0.4 mL/min 2-5 µL injection		

Table 7: ESI-MS Method Conditions

ESI Conditions	
Polarity	Negative ion
Capillary needle voltage	.5 kV
Cone Gas Flow	20 L/hr
Nitrogen desolvation gas	1100 L/hr
Desolvation gas temp.	500 ºC

Table 8: Method Analyte Source, Retention Times (RTs), and IS References

Analyte	Peak #	IS# Ref
PFBS	1	2
PFHxA	3	1
HFPO-DA	5	1
PFHpA	6	1
PFHxS	7	2
ADONA	8	1
PFOA	10	1
PFNA	11	1
PFOS	12	2
PFDA	14	1
9CL-PF3ONS	15	1
NMeFOSAA	17	3
PFUnA	18	3
NEtFOSAA	20	1
PFDoA	21	1
11CL-PFOUdS	22	1
PFTrDA	23	1
PFTA	24	1
^{13}C-PFHxA	2	1
^{13}C-HFPO-DA	4	1
^{13}C-PFDA	13	1
d_5-NEtFOSAA	19	3
^{13}C-PFOA-IS#1	9	-
^{13}C-PFOS-IS#2	10	-
d_3-NMeFOSAA-IS#3	16	-

Table 9: MS/MS Method Conditions

Segment[a]	Analyte	Precursor Ion [b] (m/z)	Product Ion [b,c] (m/z)
1	PFBS	299	80
2	PFHxA	313	269
4	HFPO-DA	285	169
5	PFHpA	363	319
6	PFHxS [e]	399	80
7	ADONA	377	251
9	PFOA	413	369
10	PFNA	463	419
11	9CL-PF3ONS	531	351
13	PFOS [e]	499	80
15	PFDA	513	469
17	NMeFOSAA [e]	570	419
19	NEtFOSAA [e]	584	419
20	11CL-PFOUdS	631	451
21	PFUnA	563	519
22	PFDoA	613	569
23	PFTrDA	663	619
24	PFTA	713	669
2	^{13}C-PFHxA	315	270
3	^{13}C-HFPO-DA	287	169
14	^{13}C-PFDA	515	470
16	d_5-NEtFOSAA	589	419
8	^{13}C-PFOA	415	370
12	^{13}C-PFOS	503	80
18	d_3-NMeFOSAA	573	419

[a] Segments are time durations in which single scan events occur; segments overlap where R.T. dictate.
[b] Precursor and product ions listed in this table are nominal masses. During MS and MS/MS optimization, the analyst should determine the precursor and product ion masses to one decimal place by locating the apex of the mass spectral peak place. These precursor and product ion masses (with one decimal place) should be used in the MS/MS method for all analyses.
[c] Ions used for quantitation purposes.
[d] Argon used as collision gas at a flow rate of 0.4 mL/min
[e] Analyte has multiple resolved chromatographic peaks due to linear and branched isomers. All peaks summed for quantitation purposes.

Determination of Selected Perfluorinated Alkyl Substances by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry Isotope Dilution (LC/MS/MS)

Reference: EPA Method 537, Version 1.1, September 2009, EPA Document #: EPA/600/R-08/09

EPA Method 537.1, Version 1, November 2018, EPA Document #: EPA/600/R-18/352

Department of Defense, Quality Systems Manual for Environmental Laboratories, Version 5.2, .2019

1. Scope and Application

Matrices: Drinking water, Non-potable Water, and Soil Matrices

Definitions: Refer to Alpha Analytical Quality Manual.

1.1 This is a liquid chromatography/tandem mass spectrometry (LC/MS/MS) method for the determination of selected perfluorinated alkyl substances (PFAS) in Non-Drinking Water and soil Matrices. Accuracy and precision data have been generated in reagent water, and finished ground and surface waters for the compounds listed in Table 1.

1.2 The data report packages present the documentation of any method modification related to the samples tested. Depending upon the nature of the modification and the extent of intended use, the laboratory may be required to demonstrate that the modifications will produce equivalent results for the matrix. Approval of all method modifications is by one or more of the following laboratory personnel before performing the modification: Area Supervisor, Department Supervisor, Laboratory Director, or Quality Assurance Officer.

1.3 This method is restricted to use by or under the supervision of analysts experienced in the operation of the LC/MS/MS and in the interpretation of LC/MS/MS data. Each analyst must demonstrate the ability to generate acceptable results with this method by performing an initial demonstration of capability.

2. Summary of Method

2.1 A 250-mL water sample is fortified with extracted internal standards (EIS) and passed through a solid phase extraction (WAX) cartridge containing a mixed mode, Weak Anion Exchange, reversed phase, water-wettable polymer to extract the method analytes and isotopically-labeled compounds. The compounds are eluted from the solid phase in two fractions with methanol followed by a small amount of 2% ammonium hydroxide in methanol solution. The extract is concentrated with nitrogen in a heated water bath, and then adjusted to a 1-mL volume with 80:20% (vol/vol) methanol:water. A 3 µl injection is made into an LC equipped with a C18 column that is interfaced to an MS/MS. The analytes are separated and identified by comparing the acquired mass spectra and retention times to reference spectra and retention times for calibration standards acquired under identical LC/MS/MS conditions. The concentration of each analyte is determined by using the isotope dilution technique. Extracted Internal Standards (EIS) analytes are used to monitor the extraction efficiency of the method analytes.

2.2 Method Modifications from Reference

None.

Table 1

Parameter	Acronym	CAS
PERFLUOROALKYL ETHER CARBOXYLIC ACIDS (PFECAs)		
Tetrafluoro-2-(heptafluoropropoxy)propanoic acid	HFPO-DA	62037-80-3
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
PERFLUOROALKYLCARBOXILIC ACIDS (PFCAs)		
Perfluorobutanoic acid	PFBA	375-22-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorohexanoic acid	PFHxA *	307-24-4
Perfluoroheptanoic acid	PFHpA *	375-85-9
Perfluorooctanoic acid	PFOA *	335-67-1
Perfluorononanoic acid	PFNA *	375-95-1
Perfluorodecanoic acid	PFDA *	335-76-2
Perfluoroundecanoic acid	PFUnA *	2058-94-8
Perfluorododecanoic acid	PFDoA *	307-55-1
Perfluorotridecanoic acid	PFTrDA *	72629-94-8
Perfluorotetradecanoic acid	PFTA *	376-06-7
Perfluorohexadecanoic acid	PFHxDA	67905-19-5
Perfluorooctadecanoic acid	PFODA	16517-11-6
PERFLUOROALKYLSULFONATES (PFASs)		
Perfluorobutanesulfonic acid	PFBS *	375-73-5
Perfluoropentanesulfonic acid	PFPeS	2706-91-4
Perfluorohexanesulfonic acid	PFHxS *	355-46-4
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorooctanesulfonic acid	PFOS *	1763-23-1
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorododecanesulfonic acid	PFDoS	79780-39-5

*** also reportable via the standard 537 method**

Table 1 Cont.

Parameter	Acronym	CAS
CHLORO-PERFLUOROALKYLSULFONATE		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1
PERFLUOROOCTANESULFONAMIDES (FOSAs)		
Perfluorooctanesulfonamide	PFOSA	754-91-6
N-methylperfluoro-1-octanesulfonamide	NMeFOSA	31506-32-8
N-ethylperfluoro-1-octanesulfonamide	NEtFOSA	4151-50-2
TELOMER SULFONATES		
1H,1H,2H,2H-perfluorohexane sulfonate (4:2)	4:2FTS	27619-93-8
1H,1H,2H,2H-perfluorooctane sulfonate (6:2)	6:2FTS	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2)	8:2FTS	39108-34-4
1H,1H,2H,2H-perfluorododecane sulfonate (10:2)	10:2FTS	120226-60-0
PERFLUOROOCTANESULFONAMIDOACETIC ACIDS		
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA *	2355-31-9
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA *	2991-50-6
NATIVE PERFLUOROOCTANESULFONAMIDOETHANOLS (FOSEs)		
2-(N-methylperfluoro-1-octanesulfonamido)-ethanol	NMeFOSE	24448-09-7
2-(N-ethylperfluoro-1-octanesulfonamido)-ethanol	NEtFOSE	1691-99-2

*** also reportable via the standard 537 method**

3. Reporting Limits

The reporting limit for PFAS's is 2 ng/L for aqueous samples (20 ng/L for HFPO-DA) and 1 ng/g (10 ng/g for HFPO-DA) for soil samples.

4. Interferences

4.1 PFAS standards, extracts and samples should not come in contact with any glass containers or pipettes as these analytes can potentially adsorb to glass surfaces. PFAS analyte and EIS standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers.

4.2 Method interferences may be caused by contaminants in solvents, reagents (including reagent water), sample bottles and caps, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. The method analytes in this method can also be found in many common laboratory supplies and equipment, such

as PTFE (polytetrafluoroethylene) products, LC solvent lines, methanol, aluminum foil, SPE sample transfer lines, etc. All items such as these must be routinely demonstrated to be free from interferences (less than 1/3 the RL for each method analyte) under the conditions of the analysis by analyzing laboratory reagent blanks as described in Section 9.2. **Subtracting blank values from sample results is not permitted.**

4.3 Matrix interferences may be caused by contaminants that are co-extracted from the sample. The extent of matrix interferences will vary considerably from source to source, depending upon the nature of the water. Humic and/or fulvic material can be co-extracted during SPE and high levels can cause enhancement and/or suppression in the electrospray ionization source or low recoveries on the SPE sorbent. Total organic carbon (TOC) is a good indicator of humic content of the sample.

4.4 SPE cartridges can be a source of interferences. The analysis of field and laboratory reagent blanks can provide important information regarding the presence or absence of such interferences. Brands and lots of SPE devices should be tested to ensure that contamination does not preclude analyte identification and quantitation.

5. Health and Safety

5.1 The toxicity or carcinogenicity of each reagent and standard used in this method is not fully established; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. A reference file of material safety data sheets is available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available in the Chemical Hygiene Plan.

5.2 All personnel handling environmental samples known to contain or to have been in contact with municipal waste must follow safety practices for handling known disease causative agents.

5.3 PFOA has been described as “likely to be carcinogenic to humans.” Pure standard materials and stock standard solutions of these method analytes should be handled with suitable protection to skin and eyes, and care should be taken not to breathe the vapors or ingest the materials.

6. Sample Collection, Preservation, Shipping and Handling

6.1 Sample Collection for Aqueous Samples

6.1.1 Samples must be collected in two (2) 250-mL high density polyethylene (HDPE) container with an unlined plastic screw cap.

6.1.2 The sample handler must wash their hands before sampling and wear nitrile gloves while filling and sealing the sample bottles. PFAS contamination during sampling can occur from a number of common sources, such as food packaging and certain foods and beverages. Proper hand washing and wearing nitrile gloves will aid in minimizing this type of accidental contamination of the samples.

6.1.3 Open the tap and allow the system to flush until the water temperature has stabilized (approximately 3 to 5 min). Collect samples from the flowing system.

6.1.4 Fill sample bottles. Samples do not need to be collected headspace free.

6.1.5 After collecting the sample and cap the bottle. Keep the sample sealed from time of collection until extraction.

6.1.6 Field Reagent Blank (FRB)

6.1.6.1 A FRB must be handled along with each sample set. The sample set is composed of samples collected from the same sample site and at the same time. At the laboratory, fill the field blank sample bottle with reagent water and preservatives, seal, and ship to the sampling site along with the sample bottles. For each FRB shipped, an empty sample bottle (no preservatives) must also be shipped. At the sampling site, the sampler must open the shipped FRB and pour the reagent water into the empty shipped sample bottle, seal and label this bottle as the FRB. The FRB is shipped back to the laboratory along with the samples and analyzed to ensure that PFAS's were not introduced into the sample during sample collection/handling.

The reagent water used for the FRBs must be initially analyzed for method analytes as a MB and must meet the MB criteria in Section 9.2.1 prior to use. This requirement will ensure samples are not being discarded due to contaminated reagent water rather than contamination during sampling.

6.2 Sample Collection for Soil and Sediment samples.

Grab samples are collected in polypropylene containers. Sample containers and contact surfaces containing PTFE shall be avoided.

6.3 Sample Preservation

Not applicable.

6.4 Sample Shipping

Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. Sample temperature must be confirmed to be at or below 10 °C when the samples are received at the laboratory. Samples stored in the lab must be held at or below 6 °C until extraction, but should not be frozen.

NOTE: Samples that are significantly above 10° C, at the time of collection, may need to be iced or refrigerated for a period of time, in order to chill them prior to shipping. This will allow them to be shipped with sufficient ice to meet the above requirements.

6.5 Sample Handling

6.5.1 Holding Times

6.5.1.1 Water samples should be extracted as soon as possible but must be extracted within 14 days. Soil samples should be extracted within 28 days. Extracts are stored at < 10 ° C and analyzed within 28 days after extraction.

7. Equipment and Supplies

7.1 SAMPLE CONTAINERS – 250-mL high density polyethylene (HDPE) bottles fitted with unlined screw caps. Sample bottles must be discarded after use.

7.2 POLYPROPYLENE BOTTLES – 4-mL narrow-mouth polypropylene bottles.

7.3 CENTRIFUGE TUBES – 50-mL conical polypropylene tubes with polypropylene screw caps for storing standard solutions and for collection of the extracts.

7.4 AUTOSAMPLER VIALS – Polypropylene 0.7-mL autosampler vials with polypropylene caps.

7.4.1 NOTE: Polypropylene vials and caps are necessary to prevent contamination of the sample from PTFE coated septa. However, polypropylene caps do not reseal, so evaporation occurs after injection. Thus, multiple injections from the same vial are not possible.

7.5 POLYPROPYLENE GRADUATED CYLINDERS – Suggested sizes include 25, 50, 100 and 1000-mL cylinders.

7.6 Auto Pipets – Suggested sizes include 5, 10, 25, 50, 100, 250, 500, 1000, 5000 and 10,000-µls.

7.7 PLASTIC PIPETS – Polypropylene or polyethylene disposable pipets.

7.8 ANALYTICAL BALANCE – Capable of weighing to the nearest 0.0001 g.

7.9 SOLID PHASE EXTRACTION (SPE) APPARATUS FOR USING CARTRIDGES

7.9.1 SPE CARTRIDGES – 0.5 g SPE cartridges containing a reverse phase copolymer characterized by a weak anion exchanger (WAX) sorbent phase.

7.9.2 VACUUM EXTRACTION MANIFOLD – A manual vacuum manifold with large volume sampler for cartridge extractions, or an automatic/robotic sample preparation system designed for use with SPE cartridges, may be used if all QC requirements discussed in Section 9 are met. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. Care must be taken with automated SPE systems to ensure the PTFE commonly used in these systems does not contribute to unacceptable analyte concentrations in the MB (Sect. 9.2.1).

7.9.3 SAMPLE DELIVERY SYSTEM – Use of a polypropylene transfer tube system, which transfers the sample directly from the sample container to the SPE cartridge, is recommended, but not mandatory. Standard extraction manifolds come equipped with PTFE transfer tube systems. These can be replaced with 1/8” O.D. x 1/16” I.D. polypropylene or polyethylene tubing cut to an appropriate length to ensure no sample contamination from the sample transfer lines. Other types of non-PTFE tubing may be used provided it meets the MB (Sect. 9.2.1) and LCS (Sect. 9.3) QC requirements. The PTFE transfer tubes may be used, but an MB must be run on each PFTE transfer tube and the QC requirements in Section 13.2.2 must be met. In the case of automated SPE, the removal of PTFE lines may not be feasible; therefore, MBs will need to be rotated among the ports and must meet the QC requirements of Sections 13.2.2 and 9.2.1.

7.10 Extract Clean-up Cartridge – 250 mg 6ml SPE Cartridge containing graphitized polymer carbon

7.11 EXTRACT CONCENTRATION SYSTEM – Extracts are concentrated by evaporation with nitrogen using a water bath set no higher than 65 °C.

7.12 LABORATORY OR ASPIRATOR VACUUM SYSTEM – Sufficient capacity to maintain a vacuum of approximately 10 to 15 inches of mercury for extraction cartridges.

7.13 LIQUID CHROMATOGRAPHY (LC)/TANDEM MASS SPECTROMETER (MS/MS) WITH DATA SYSTEM

7.13.1 LC SYSTEM – Instrument capable of reproducibly injecting up to 10-µL aliquots, and performing binary linear gradients at a constant flow rate near the flow rate used for development of this method (0.4 mL/min). The LC must be capable of pumping the water/methanol mobile phase without the use of a degasser which pulls vacuum on the mobile phase bottle (other types of degassers are acceptable). Degassers which pull vacuum on the mobile phase bottle will volatilize the ammonium acetate mobile phase causing the analyte peaks to shift to earlier retention times over the course of the analysis batch. The usage of a column heater is optional.

NOTE: During the course of method development, it was discovered that while idle for more than one day, PFAS's built up in the PTFE solvent transfer lines. To prevent long delays in purging high levels of PFAS's from the LC solvent lines, they were replaced with PEEK tubing and the PTFE solvent frits were replaced with stainless steel frits. It is not possible to remove all PFAS background contamination, but these measures help to minimize their background levels.

7.13.2 LC/TANDEM MASS SPECTROMETER – The LC/MS/MS must be capable of negative ion electrospray ionization (ESI) near the suggested LC flow rate of 0.4 mL/min. The system must be capable of performing MS/MS to produce unique product ions for the method analytes within specified retention time segments. A minimum of 10 scans across the chromatographic peak is required to ensure adequate precision.

7.13.3 DATA SYSTEM – An interfaced data system is required to acquire, store, reduce, and output mass spectral data. The computer software should have the capability of processing stored LC/MS/MS data by recognizing an LC peak within any given retention time window. The software must allow integration of the ion abundance of any specific ion within specified time or scan number limits. The software must be able to calculate relative response factors, construct linear regressions or quadratic calibration curves, and calculate analyte concentrations.

7.13.4 ANALYTICAL COLUMN – An LC BEH C_{18} column (2.1 x 50 mm) packed with 1.7 µm d_p C_{18} solid phase particles was used. Any column that provides adequate resolution, peak shape, capacity, accuracy, and precision (Sect. 9) may be used.

8. Reagents and Standards

8.1 GASES, REAGENTS, AND SOLVENTS – Reagent grade or better chemicals should be used.

8.1.1 REAGENT WATER – Purified water which does not contain any measurable quantities of any method analytes or interfering compounds greater than 1/3 the RL for each method analyte of interest. Prior to daily use, at least 3 L of reagent water should be flushed from the purification system to rinse out any build-up of analytes in the system's tubing.

8.1.2 METHANOL (CH_3OH, CAS#: 67-56-1) – High purity, demonstrated to be free of analytes and interferences.

8.1.3 AMMONIUM ACETATE ($NH_4C_2H_3O_2$, CAS#: 631-61-8) – High purity, demonstrated to be free of analytes and interferences.

8.1.4 ACETIC ACID (H_3CCOOH, CAS#: 64-19-7) - High purity, demonstrated to be free of analytes and interferences.

8.1.5 1M AMMONIUM ACETATE/REAGENT WATER – High purity, demonstrated to be free of analytes and interferences.

8.1.6 2mM AMMONIUM ACETATE/METHANOL:WATER (5:95) – To prepare, mix 2 ml of 1M AMMONIUM ACETATE,1 ml ACETIC ACID and 50 ml METHANOL into l Liter of REAGENT WATER.

8.1.7 Methanol/Water (80:20) – To prepare a 1 Liter bottle, mix 200 ml of REAGENT WATER with 800 ml of METHANOL.

8.1.8 AMMONIUM HYDROXIDE (NH_3, CAS#: 1336-21-6) – High purity, demonstrated to be free of analytes and interferences.

8.1.9 Sodium Acetate ($NaOOCCH_3$, CAS#: 127-09-3) – High purity, demonstrated to be free of analytes and interferences.

8.1.10 25 mM Sodium Acetate Buffer – To prepare 250mls, dissolve .625 grams of sodium acetate into 100 mls of reagent water. Add 4 mls Acetic Acid and adjust the final volume to 250 mls with reagent water.

8.1.11 NITROGEN – Used for the following purposes: Nitrogen aids in aerosol generation of the ESI liquid spray and is used as collision gas in some MS/MS instruments. The nitrogen used should meet or exceed instrument manufacturer's specifications. In addition, Nitrogen is used to concentrate sample extracts (Ultra High Purity or equivalent).

8.1.12 ARGON – Used as collision gas in MS/MS instruments. Argon should meet or exceed instrument manufacturer's specifications. Nitrogen gas may be used as the collision gas provided sufficient sensitivity (product ion formation) is achieved.

8.2 STANDARD SOLUTIONS – When a compound purity is assayed to be 96% or greater, the weight can be used without correction to calculate the concentration of the stock standard. PFAS analyte and IS standards commercially purchased in glass ampoules are acceptable; however, all subsequent transfers or dilutions performed by the analyst must be prepared and stored in polypropylene containers. Standards for sample fortification generally should be prepared in the smallest volume that can be accurately measured to minimize the addition of excess organic solvent to aqueous samples.

NOTE: Stock standards and diluted stock standards are stored at ≤4 °C.

8.2.1 ISOTOPE DILUTION Extracted Internal Standard (ID EIS) STOCK SOLUTIONS - ID EIS stock standard solutions are stable for at least 6 months when stored at 4 °C. The stock solution is purchased at a concentration of 1000 ng/mL.

8.2.2 ISOTOPE DILUTION Extracted Internal Standard PRIMARY DILUTION STANDARD (ID EIS PDS) – Prepare the ID EIS PDS at a concentration of 500 ng/mL. The ID PDS is prepared in 80:20% (vol/vol) methanol:water. The ID PDS is stable for 6 months when stored at ≤4 °C.

Table 2

Isotope Labeled Standard	Conc. of EIS Stock (ng/mL)	Vol. of EIS Stock (mL)	Final Vol. of EIS PDS (mL)	Final Conc. of EIS PDS (ng/mL)
M4PFBA	1000	1.0	2.0	500
M5PFPeA	1000	1.0	2.0	500
M5PFHxA	1000	1.0	2.0	500
M4PFHpA	1000	1.0	2.0	500
M8PFOA	1000	1.0	2.0	500
M9PFNA	1000	1.0	2.0	500
M6PFDA	1000	1.0	2.0	500
M7PFUdA	1000	1.0	2.0	500
MPFDoA	1000	1.0	2.0	500
M2PFTeDA	1000	1.0	2.0	500
M2PFHxDA	50,000	.02	2.0	500
d3-N-MeFOSA	50,000	.02	2.0	500
d5-N-EtFOSA	50,000	.02	2.0	500
d7-N-MeFOSE	50,000	.02	2.0	500
d9-N-EtFOSE	50,000	.02	2.0	500
M8FOSA	1000	1.0	2.0	500
d3-N-MeFOSAA	1000	1.0	2.0	500
d5-N-EtFOSAA	1000	1.0	2.0	500
M3PFBS	929	1.0	2.0	464.5
M3PFHxS	946	1.0	2.0	473
M8PFOS	957	1.0	2.0	478.5
M2-4:2FTS	935	1.0	2.0	467.5
M2-6:2FTS	949	1.0	2.0	474.5
M2-8:2FTS	958	1.0	2.0	479
M3HFPO-DA	50,000	.4	2.0	10,000

8.2.3 ANALYTE STOCK STANDARD SOLUTION – Analyte stock standards are stable for at least 6 months when stored at 4 °C. When using these stock standards to prepare a PDS, care must be taken to ensure that these standards are at room temperature and adequately vortexed.

8.2.4 Analyte Secondary Spiking Standard Prepare the spiking solution of additional add on components for project specific requirements only. ANALYTE PRIMARY SPIKING STANDARD – Prepare the spiking standard at a concentration of 500 ng/mL in methanol. The spiking standard is stable for at least two months when stored in polypropylene centrifuge tubes at room temperature.

Table 3

Analyte	Conc. of IS Stock (ng/mL)	Vol. of IS Stock (mL)	Final Vol. of IS PDS (mL)	Final Conc. of IS PDS (ng/mL)
PFBA	2000	1	4	500
PFPeA	2000	1	4	500
PFHxA	2000	1	4	500
PFHpA	2000	1	4	500
PFOA	2000	1	4	500
PFNA	2000	1	4	500
PFDA	2000	1	4	500
PFUdA	2000	1	4	500
PFDoA	2000	1	4	500
PFTrDA	2000	1	4	500
PFTeDA	2000	1	4	500
FOSA	2000	1	4	500
N-MeFOSAA	2000	1	4	500
N-EtFOSAA	2000	1	4	500
L-PFBS	1770	1	4	442.5
L-PFPeS	1880	1	4	470
L-PFHxSK	1480	1	4	370
Br-PFHxSK	344	1	4	86
L-PFHpS	1900	1	4	475
L-PFOSK	1460	1	4	365
Br-PFOSK	391	1	4	97.75
L-PFNS	1920	1	4	480
L-PFDS	1930	1	4	482.5
4:2FTS	1870	1	4	467.5
6:2FTS	1900	1	4	475
8:2FTS	1920	1	4	480

8.2.5 Analyte Secondary Spiking Standard Prepare the spiking solution of additional add on components for project specific requirements only.

Table 4

Analyte	Conc. of IS Stock (ng/mL)	Vol. of IS Stock (mL)	Final Vol. of IS PDS (mL)	Final Conc. of IS PDS (ng/mL)
ADONA	2000	1	4	500
PFHxDA	2000	1	4	500
PFODA	2000	1	4	500
HFPO-DA	100,000	.4	4	10,000
9ClPF3ONS	50,000	0.04	4	500
11ClPF3OUdS	50,000	0.04	4	500

8.2.6 LOW, MEDIUM AND HIGH LEVEL LCS – The LCS's will be prepared at the following concentrations and rotated per batch; 2 ng/L, 40 ng/L, 500 ng/l for drinking waters. The analyte PDS contains all the method analytes of interest at various concentrations in methanol. The analyte PDS has been shown to be stable for six months when stored at ≤4 °C.

8.2.7 Isotope Dilution Labeled Recovery Stock Solutions (ID REC) – ID REC Stock solutions are stable for at least 6 months when stored at 4 °C. The stock solution is purchased at a concentration of 1000 ng/mL.

8.2.8 Isotope Dilution Labeled Recovery Primary Dilution Standard (ID REC PDS) - Prepare the ID REC PDS at a concentration of 500 ng/mL. The ID REC PDS is prepared in 80:20% (vol/vol) methanol:water. The ID REC PDS is stable for at least six months when stored in polypropylene centrifuge tubes at ≤4 °C.

Table 5

Analyte	Conc. of REC Stock (ng/mL)	Vol. of REC Stock (mL)	Final Vol. of REC PDS (mL)	Final Conc. of REC PDS (ng/mL)
M2PFOA	2000	1	4	500
M2PFDA	2000	1	4	500
M3PFBA	2000	1	4	500
M4PFOS	2000	1	4	500

8.2.9 CALIBRATION STANDARDS (CAL) –

Current Concentrations (ng/mL): 0.5, 1.0, 5.0, 10.0, 50.0, 125, 150, 250, 500

Prepare the CAL standards over the concentration range of interest from dilutions of the analyte PDS in methanol containing 20% reagent water. 20 µl of the EIS PDS and REC PDS are added to the CAL standards to give a constant concentration of 10 ng/ml. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity. The CAL standards may also be used as CCVs (Sect. 9.8). To make calibration stock standards:

Table 6

Calibration Standard Concentration	Final Aqueous Cal STD Level Concentration	Final Soil Cal STD Level Concentration	24 compound stock added (ul)	PFHxDA Stock added (ul)	500 ng/ml PFHxDA dilution added (ul)	PFODA Stock added (ul)	500 ng/ml PFODA dilution added (ul)	ADONA, HFPO-DA, 11Cl-PF3OUdS, 9Cl-PF3ONS Stock added (ul)	500 ng/ml ADONA dilution added (ul)	Final Volume in MeOH/H_2O (82:20)
.5 ng/ml	2 ng/L	.25 ng/g	6.25		25		25		25	25 mls
1 ng/ml	4 ng/L	.5 ng/g	5		20		20		20	10 mls
5 ng/ml	20 ng/L	1 ng/g	25		100		100		100	10 mls
10 ng/ml	40 ng/L	5 ng/g	125	5		5		5		25 mls

50 ng/ml	200 ng/L	25 ng/g	250	10		10		10		10 mls
125 ng/ml	500 ng/L	62.5 ng/g	625	25		25		25		10 mls
150 ng/ml	600 ng/L	75 ng/g	750	30		30		30		10 mls
250 ng/ml	1000 ng/L	125 ng/g	625							5 mls
500 ng/ml	2000 ng/L	250 ng/g	1250							5 mls

9. Quality Control

The laboratory must maintain records to document the quality of data that is generated. Ongoing data quality checks are compared with established performance criteria to determine if the results of analyses meet the performance characteristics of the method.

9.1 MINIMUM REPORTING LIMIT (MRL) CONFIRMATION

9.1.1 Fortify, extract, and analyze seven replicate LCSs at 2 ng/l. Calculate the mean measured concentration (*Mean*) and standard deviation for these replicates. Determine the Half Range for the prediction interval of results (HR_{PIR}) using the equation below

$$HR_{PIR} = 3.963s$$

Where:

s = the standard deviation
3.963 = a constant value for seven replicates.

9.1.2 Confirm that the upper and lower limits for the Prediction Interval of Result (*PIR* = *Mean* ± HR_{PIR}) meet the upper and lower recovery limits as shown below

The Upper PIR Limit must be ≤150% recovery.

$$\frac{Mean + HR_{PIR}}{Fortified\ Concentration} \times 100\% \leq 150\%$$

The Lower PIR Limit must be ≥ 50% recovery.

$$\frac{Mean - HR_{PIR}}{Fortified\ Concentration} \times 100\% \geq 50\%$$

9.1.3 The RL is validated if both the Upper and Lower PIR Limits meet the criteria described above. If these criteria are not met, the RL has been set too low and must be determined again at a higher concentration.

9.2 Blank(s)

9.2.1 **METHOD BLANK (MB) -** A Method Blank (MB) is required with each extraction batch to confirm that potential background contaminants are not interfering with the identification or quantitation of method analytes. Prep and analyze a MB for every 20 samples. If the MB produces a peak within the retention time window of any analyte that would prevent the determination of that analyte, determine the source of contamination and eliminate the interference before processing samples. Background contamination must be reduced to an acceptable level before proceeding. Background from method analytes or other contaminants that

interfere with the measurement of method analytes must be below the RL. If the method analytes are detected in the MB at concentrations equal to or greater than this level, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch. Because background contamination is a significant problem for several method analytes, it is highly recommended that the analyst maintain a historical record of MB data.

9.2.2 **FIELD REAGENT BLANK (FRB)** - The purpose of the FRB is to ensure that PFAS's measured in the Field Samples were not inadvertently introduced into the sample during sample collection/handling. Analysis of the FRB is required only if a Field Sample contains a method analyte or analytes at or above the RL. The FRB is processed, extracted and analyzed in exactly the same manner as a Field Sample.

9.3 Laboratory Control Sample (LCS) and Laboratory Control Sample Duplicates (LCSD)

9.3.1 An LCS is required with each extraction batch. The fortified concentration of the LCS may be rotated between low, medium, and high concentrations from batch to batch. Default limits of 50-150% of the true value may be used for analytes until sufficient replicates have been analyzed to generate proper control limits. Calculate the percent recovery (%*R*) for each analyte using the equation

$$\%R = \frac{A \times 100}{B}$$

Where:

A = measured concentration in the fortified sample
B =fortification concentration.

9.3.2 Where applicable, LCSD's are to be extracted and analyzed. The concentration and analyte recovery criteria for the LCSD must be the same as the batch LCS The RSD's must fall within ≤30% of the true value for medium and high level replicates, and ≤50% for low level replicates. Calculate the relative percent difference (RPD) for duplicate MSs (MS and MSD) using the equation

$$RPD = \frac{|LCS - LCSD|}{(LCS + LCSD) / 2} \times 100$$

9.3.3 **If the LCS and or LCSD results do not meet these criteria for method analytes, then all data for the problem analyte(s) must be considered invalid for all samples in the extraction batch.**

9.4 Labeled Recovery Standards (REC)

The analyst must monitor the peak areas of the REC(s) in all injections during each analysis day.

9.5 Extracted Internal Standards (EIS)

9.5.1 The EIS standard is fortified into all samples, CCVs, MBs, LCSs, MSs, MSDs, FD, and FRB prior to extraction. It is also added to the CAL standards. The EIS is a means of assessing method performance from extraction to final

chromatographic measurement. Calculate the recovery (%R) for the EIS using the following equation

$$\%R = (A / B) \times 100$$

Where:

A = calculated EIS concentration for the QC or Field Sample
B = fortified concentration of the EIS.

9.5.2 Default limits of 50-150% may be used for analytes until sufficient replicates have been analyzed to generate proper control limits. A low or high percent recovery for a sample, blank, or CCV does not require discarding the analytical data but it may indicate a potential problem with future analytical data. When EIS recovery from a sample, blank, or CCV are outside control limits, check 1) calculations to locate possible errors, 2) standard solutions for degradation, 3) contamination, and 4) instrument performance. For CCVs and QC elements spiked with all target analytes, if the recovery of the corresponding target analytes meet the acceptance criteria for the EIS in question, the data can be used but all potential biases in the recovery of the EIS must be documented in the sample report. If the associated target analytes do not meet the acceptance criteria,the data must be reanalyzed.

9.6 Matrix Spike (MS)

9.6.1 Analysis of an MS is required in each extraction batch and is used to determine that the sample matrix does not adversely affect method accuracy. Assessment of method precision is accomplished by analysis of a Field Duplicate (FD) (Sect. 9.6); however, infrequent occurrence of method analytes would hinder this assessment. If the occurrence of method analytes in the samples is infrequent, or if historical trends are unavailable, a second MS, or MSD, must be prepared, extracted, and analyzed from a duplicate of the Field Sample. Extraction batches that contain MSDs will not require the extraction of a field sample duplicate. If a variety of different sample matrices are analyzed regularly, for example, drinking water from groundwater and surface water sources, method performance should be established for each. Over time, MS data should be documented by the laboratory for all routine sample sources.

9.6.2 Within each extraction batch, a minimum of one Field Sample is fortified as an MS for every 20 Field Samples analyzed. The MS is prepared by spiking a sample with an appropriate amount of the Analyte Stock Standard (Sect. 8.2.3). Use historical data and rotate through the low, mid and high concentrations when selecting a fortifying concentration. Calculate the percent recovery (%*R*) for each analyte using the equation

$$\%R = \frac{(A - B)}{C} \times 100$$

Where:

A = measured concentration in the fortified sample
B = measured concentration in the unfortified sample
C = fortification concentration.

9.6.3 Analyte recoveries may exhibit matrix bias. For samples fortified at or above their native concentration, recoveries should range between 50-150%. If the accuracy of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the LCS, the recovery is judged to be

matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7 Laboratory Duplicate

9.7.1 FIELD DUPLICATE OR LABORATORY FORTIFIED SAMPLE MATRIX DUPLICATE (FD or MSD) – Within each extraction batch (not to exceed 20 Field Samples), a minimum of one FD or MSD must be analyzed. Duplicates check the precision associated with sample collection, preservation, storage, and laboratory procedures. If method analytes are not routinely observed in Field Samples, an MSD should be analyzed rather than an FD.

9.7.2 Calculate the relative percent difference (*RPD*) for duplicate measurements (*FD1* and *FD2*) using the equation

$$RPD = \frac{|FD1 - FD2|}{(FD1 + FD2) / 2} \times 100$$

9.7.3 RPDs for FDs should be ≤30%. Greater variability may be observed when FDs have analyte concentrations that are within a factor of 2 of the RL. At these concentrations, FDs should have RPDs that are ≤50%. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the CCV, the recovery is judged to be matrix biased. The result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.7.4 If an MSD is analyzed instead of a FD, calculate the relative percent difference (RPD) for duplicate MSs (MS and MSD) using the equation

$$RPD = \frac{|MS - MSD|}{(MS + MSD) / 2} \times 100$$

9.7.5 RPDs for duplicate MSs should be ≤30% for samples fortified at or above their native concentration. Greater variability may be observed when MSs are fortified at analyte concentrations that are within a factor of 2 of the RL. MSs fortified at these concentrations should have RPDs that are ≤50% for samples fortified at or above their native concentration. If the RPD of any analyte falls outside the designated range, and the laboratory performance for that analyte is shown to be in control in the LCSD where applicable, the result is judged to be matrix biased. If no LCSD is present, the associated MS and MSD are to be re-analyzed to determine if any analytical has occurred. If the resulting RPDs are still outside control limits, the result for that analyte in the unfortified sample is labeled suspect/matrix to inform the data user that the results are suspect due to matrix effects.

9.8 Initial Calibration Verification (ICV)

9.8.1 As part of the IDC (Sect. 13.2), and after each ICAL, analyze a QCS sample from a source different from the source of the CAL standards. If a second vendor is not available, then a different lot of the standard should be used. The QCS should be prepared and analyzed just like a CCV. Acceptance criteria for the QCS are identical to the CCVs; the calculated amount for each analyte must be ±

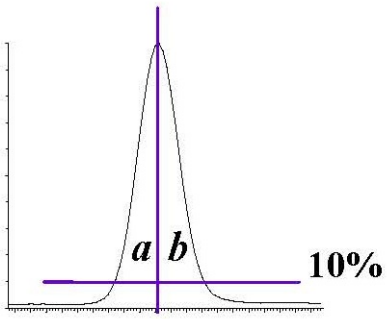
30% of the expected value. If measured analyte concentrations are not of acceptable accuracy, check the entire analytical procedureto locate and correct the problem.

9.9 Continuing Calibration Verification (CCV)

9.9.1 CCV Standards are analyzed at the beginning of each analysis batch, after every 10 Field Samples, and at the end of the analysis batch. See Section 10.7 for concentration requirements and acceptance criteria.

9.10 Method-specific Quality Control Samples

9.10.1 PEAK ASYMMETRY FACTOR – A peak asymmetry factor must be calculated using the equation below during the IDL and every time a calibration curve is generated. The peak asymmetry factor for the first two eluting peaks in a midlevel CAL standard (if only two analytes are being analyzed, both must be evaluated) must fall in the range of 0.8 to 1.5. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.



$$A_s = b / a$$

Where:

A_s = peak asymmetry factor
b = width of the back half of the peak measured (at 10% peak height) from the trailing edge of the peak to a line dropped perpendicularly from the peak apex
a = the width of the front half of the peak measured (at 10% peak height) from the leading edge of the peak to a line dropped perpendicularly from the apex.

9.11 Method Sequence

- CCV-LOW
- MB
- LCS
- LCSD
- MS
- Duplicate or MSD
- Field Samples (1-10)
- CCV-MID
- Field Samples (11-20)
- CCV-LOW

10. Procedure

10.1 Equipment Set-up

10.1.1 This procedure may be performed manually or in an automated mode using a robotic or automatic sample preparation device. If an automated system is used to prepare samples, follow the manufacturer's operating instructions, but all extraction and elution steps must be the same as in the manual procedure. Extraction and/or elution steps may not be changed or omitted to accommodate the use of an automated system. If an automated system is used, the MBs should be rotated among the ports to ensure that all the valves and tubing meet the MB requirements (Sect. 9.2).

10.1.2 Some of the PFAS's adsorb to surfaces, including polypropylene. Therefore, the aqueous sample bottles must be rinsed with the elution solvent (Sect 10.3.4) whether extractions are performed manually or by automation. The bottle rinse is passed through the cartridge to elute the method analytes and is then collected (Sect. 10.3.4).

10.1.3 **NOTE:** The SPE cartridges and sample bottles described in this section are designed as single use items and should be discarded after use. They may not be refurbished for reuse in subsequent analyses.

10.2 Sample Preparation and Extraction of Aqueous Samples

10.2.1 Samples are preserved, collected and stored as presented in Section 6.

The entire sample that is received must be sent through the SPE cartridge. In addition, the bottle must be solvent rinsed and this rinse must be sent through the SPE cartridge as well. The method blank (MB) and laboratory control sample (LCS) must be extracted in exactly the same manner (i.e., must include the bottle solvent rinse). It should be noted that a water rinse alone is not sufficient. This does not apply to samples with high concentrations of PFAS that are prepared using serial dilution and not SPE.

10.2.2 Determine sample volume. Weigh all samples to the nearest 1g. If visible sediment is present, centrifuge and decant into a new 250mL HDPE bottle and record the weight of the new container.

NOTE: Some of the PFAS's adsorb to surfaces, thus the sample volume may **NOT** be transferred to a graduated cylinder for volume measurement.

10.2.3 The MB, LCS and FRB may be prepared by measuring 250 mL of reagent water with a polypropylene graduated cylinder or filling a 250-mL sample bottle to near the top.

10.2.4 Adjust the QC and sample pH to 3 by adding acetic acid in water dropwise

10.2.5 Add 20 µL of the EIS PDS (Sect. 8.2.2) to each sample and QC, cap and invert to mix.

10.2.6 If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.3). Cap and invert each sample to mix.

10.3 Cartridge SPE Procedure

10.3.1 CARTRIDGE CLEAN-UP AND CONDITIONING – DO NOT allow cartridge packing material to go dry during any of the conditioning steps. Rinse each cartridge with 3 X 5 mL of 2% ammonium hydroxide in methanol, followed by 5mls of methanol. Next, rinse each cartridge with 5 mls of the 25 mM acetate buffer, followed by 15 mL of reagent water, without allowing the water to drop below the top edge of the packing. If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Add 4-5 mL of reagent water to each cartridge, attach the sample transfer tubes (Sect. 7.9.3), turn on the vacuum, and begin adding sample to the cartridge.

10.3.2 SAMPLE EXTRACTON – Adjust the vacuum so that the approximate flow rate is approximately 4 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.3.3 SAMPLE BOTTLE AND CARTRIDGE RINSE – After the entire sample has passed through the cartridge, rinse the sample bottles with 4 ml reagent water followed by 4 ml 25 mM acetate buffer at pH 4 and draw the aliquot through the sample transfer tubes and the cartridges. Draw air or nitrogen through the cartridge for 5-10 min at high vacuum (10-15 in. Hg). **NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the entire sample has passed through the cartridge, the reservoirs must be rinsed to waste with reagent water.**

10.3.4 SAMPLE BOTTLE AND CARTRIDGE ELUTION, Fraction 1 – Turn off and release the vacuum. Lift the extraction manifold top and insert a rack with collection tubes into the extraction tank to collect the extracts as they are eluted from the cartridges. Rinse the sample bottles with 12 mls of methanol and draw the aliquot through the sample transfer tubes and cartridges. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion.

SAMPLE BOTTLE AND CARTRIDGE ELUTION, Fraction 2 In a separate collection vial, rinse the sample bottles with 12 mL of 2% ammonium hydroxide in methanol and elute the analytes from the cartridges by pulling the 4 mL of methanol through the sample transfer tubes and the cartridges. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion. To the final extract, add 50 ul of acetic acid.

NOTE: If empty plastic reservoirs are used in place of the sample transfer tubes to pass the samples through the cartridges, these reservoirs must be treated like the transfer tubes. After the reservoirs have been rinsed in Section 10.3.3, the elution solvent used to rinse the sample bottles must be swirled down the sides of the reservoirs while eluting the cartridge to ensure that any method analytes on the surface of the reservoirs are transferred to the extract.

CLEAN-UP CARTRIDGE ELUTION, Elute the clean-up cartridge with 8 additional mls of methanol and draw the aliquot through the cartridge. Use a low vacuum such that the solvent exits the cartridge in a dropwise fashion.

10.3.5 Fractions 1 and 2 are to be combined during the concentration stage (section10.6)

10.4 Sample Prep and Extraction Protocol for Soils

10.4.1 Homogenize and weigh 2 grams of sample (measured to the nearest hundredth of a gram) intoa 50 ml polypropylene centrifuge tube. For laboratory control blanks and spikes, 2 grams of clean sand is used.

10.4.2 Add 20 µL of the EIS PDS (Sect. 8.2.2) to each sample and QC.

10.4.3 If the sample is an LCS, LCSD, MS, or MSD, add the necessary amount of analyte PDS (Sect. 8.2.3). Cap and invert each sample to mix.

10.4.4 To all samples, add 10 mls of methanol, cap, vortex for 25 seconds at 3000RPM and mix for 30 minutes using a shaker table of tumbler at 120RPM.

10.4.5 Following mixing, sonicate each sample for 30 minutes and let samples sit overnight (at least 2 hours is required for RUSH samples).

10.4.6 Centrifuge each sample at 3500RPM for 10 minutes.

10.4.7 Remove supernatant, and reserve for clean-up.

10.5 Extract Clean-up

10.5.1 CARTRIDGE CLEAN-UP AND CONDITIONING –. Rinse each cartridge with 15 mL of methanol and discard. If the cartridge goes dry during the conditioning phase, the conditioning must be started over. Attach the sample transfer tubes (Sect. 7.9.3), turn on the vacuum, and begin adding sample to the cartridge.

10.5.2 Adjust the vacuum so that the approximate flow rate is 1-2 mL/min. Do not allow the cartridge to go dry before all the sample has passed through.

10.5.3 SAMPLE BOTTLE AND CARTRIDGE RINSE – After the entire sample has passed through the cartridge, rinse the sample collection vial with two 1-mL aliquots of methanol and draw each aliquot through the cartridges. Draw air or nitrogen through the cartridge for 5 min at high vacuum (10-15 in. Hg).

10.5.4 If extracts are not to be immediately evaporated, cover collection tubes and store at ambient temperature till concentration.

10.6 Extract Concentration

10.6.1 Concentrate the extract to dryness under a gentle stream of nitrogen in a heated water bath (60-65 °C) to remove all the water/methanol mix. Add the appropriate amount of 80:20% (vol/vol) methanol:water solution and 20 µl of the ID REC PDS (Sect. 8.2.7) to the collection vial to bring the volume to 1 mL and vortex. Transfer two aliquots with a plastic pipet (Sect. 7.6) into 2 polypropylene autosampler vials.

NOTE: It is recommended that the entire 1-mL aliquot not be transferred to the autosampler vial because the polypropylene autosampler caps do not reseal after injection. Therefore, do not store the extracts in the autosampler vials as evaporation losses can occur occasionally in these autosampler vials. Extracts can be split between 2 X 700 µl vials (Sect. 7.4).

10.7 Sample Volume Determination

10.7.1 If the level of the sample was marked on the sample bottle, use a graduated cylinder to measure the volume of water required to fill the original sample bottle to the mark made prior to extraction. Determine to the nearest 10 mL.

10.7.2 If using weight to determine volume, weigh the empty bottle to the nearest 10 g and determine the sample weight by subtraction of the empty bottle weight from the original sample weight (Sect. 10.2.2). Assume a sample density of 1.0 g/mL. In either case, the sample volume will be used in the final calculations of the analyte concentration (Sect. 11.2).

10.8 Initial Calibration - Demonstration and documentation of acceptable initial calibration is required before any samples are analyzed. After the initial calibration is successful, a CCV is required at the beginning and end of each period in which analyses are performed, and after every tenth Field Sample.

10.8.1 ESI-MS/MS TUNE

10.8.1.1 Calibrate the mass scale of the MS with the calibration compounds and procedures prescribed by the manufacturer.

10.8.1.2 Optimize the [M-H]- for each method analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.4 mL/min). This tune can be done on a mix of the method analytes. The MS parameters (voltages, temperatures, gas flows, etc.) are varied until optimal analyte responses are determined. The method analytes may have different optima requiring some compromise between the optima.

10.8.1.3 Optimize the product ion for each analyte by infusing approximately 0.5-1.0 µg/mL of each analyte (prepared in the initial mobile phase conditions) directly into the MS at the chosen LC mobile phase flow rate (approximately 0.4 mL/min). This tune can be done on a mix of the method analytes. The MS/MS parameters (collision gas pressure, collision energy, etc.) are varied until optimal analyte responses are determined. Typically, the carboxylic acids have very similar MS/MS conditions and the sulfonic acids have similar MS/MS conditions.

10.8.2 Establish LC operating parameters that optimize resolution and peak shape. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

Cautions: LC system components, as well as the mobile phase constituents, contain many of the method analytes in this method. Thus, these PFAS's will build up on the head of the LC column during mobile phase equilibration. To minimize the background PFAS peaks and to keep background levels constant, the time the LC column sits at initial conditions must be kept constant and as short as possible (while ensuring reproducible retention times). In addition, prior to daily use, flush the column with 100% methanol for at least 20 min before initiating a sequence. It may be necessary on some systems to flush other LC components such as wash syringes, sample needles or any other system components before daily use.

10.8.3 Inject a mid-level CAL standard under LC/MS conditions to obtain the retention times of each method analyte. If analyzing for PFTA, ensure that the LC

conditions are adequate to prevent co-elution of PFTA and the mobile phase interferants. These interferants have the same precursor and products ions as PFTA, and under faster LC conditions may co-elute with PFTA. Divide the chromatogram into retention time windows each of which contains one or more chromatographic peaks. During MS/MS analysis, fragment a small number of selected precursor ions ([M-H]-) for the analytes in each window and choose the most abundant product ion. For maximum sensitivity, small mass windows of ±0.5 daltons around the product ion mass were used for quantitation.

10.8.4 Inject a mid-level CAL standard under optimized LC/MS/MS conditions to ensure that each method analyte is observed in its MS/MS window and that there are at least 10 scans across the peak for optimum precision.

10.8.4.1 If broad, split or fronting peaks are observed for the first two eluting chromatographic peaks (if only two analytes are being analyzed, both must be evaluated), change the initial mobile phase conditions to higher aqueous content until the peak asymmetry ratio for each peak is 0.8 – 1.5. The peak asymmetry factor is calculated as described in Section 9.9.1 on a mid-level CAL standard. The peak asymmetry factor must meet the above criteria for the first two eluting peaks during the IDL and every time a new calibration curve is generated. Modifying the standard or extract composition to more aqueous content to prevent poor shape is not permitted.

NOTE: PFHxS, PFOS, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to chromatographic resolution of the linear and branched isomers of these compounds. Most PFAS's are produced by two different processes. One process gives rise to linear PFAS's only while the other process produces both linear and branched isomers. Thus, both branched and linear PFAS's can potentially be found in the environment. For the aforementioned compounds that give rise to more than one peak, all the chromatographic peaks observed in the standard must be integrated and the areas totaled. Chromatographic peaks in a sample must be integrated in the same way as the CAL standard.

10.8.5 Prepare a set of CAL standards as described in Section 8.2.5. The lowest concentration CAL standard must be at or below the RL (2 ng/L), which may depend on system sensitivity.

10.8.6 The LC/MS/MS system is calibrated using the IS technique. Use the LC/MS/MS data system software to generate a linear regression or quadratic calibration curve for each of the analytes. This curve **must always** be forced through zero and may be concentration weighted, if necessary. Forcing zero allows for a better estimate of the background levels of method analytes. A minimum of 5 levels are required for a linear calibration model and a minimum of 6 levels are required for a quadratic calibration model.

10.8.7 CALIBRATION ACCEPTANCE CRITERIA – A linear fit is acceptable if the coefficient of determination (r^2) is greater than 0.99. When quantitated using the initial calibration curve, each calibration point, except the lowest point, for each analyte should calculate to be within 70-130% of its true value. The lowest CAL point should calculate to be within 50-150% of its true value. If these criteria cannot be met, the analyst will have difficulty meeting ongoing QC criteria. It is

recommended that corrective action is taken to reanalyze the CAL standards, restrict the range of calibration, or select an alternate method of calibration (forcing the curve through zero is still required).

10.8.7.1 CAUTION: When acquiring MS/MS data, LC operating conditions must be carefully reproduced for each analysis to provide reproducible retention times. If this is not done, the correct ions will not be monitored at the appropriate times. As a precautionary measure, the chromatographic peaks in each window must not elute too close to the edge of the segment time window.

10.9 CONTINUING CALIBRATION CHECK (CCV) – Minimum daily calibration verification is as follows. Verify the initial calibration at the beginning and end of each group of analyses, and after every tenth sample during analyses. In this context, a "sample" is considered to be a Field Sample. MBs, CCVs, LCSs, MSs, FDs FRBs and MSDs are not counted as samples. The beginning CCV of each analysis batch must be at or below the RL in order to verify instrument sensitivity prior to any analyses. If standards have been prepared such that all low CAL points are not in the same CAL solution, it may be necessary to analyze two CAL standards to meet this requirement. Alternatively, the analyte concentrations in the analyte PDS may be customized to meet these criteria. Subsequent CCVs should alternate between a medium and Low concentration CAL standard.

10.9.1 Inject an aliquot of the appropriate concentration CAL standard and analyze with the same conditions used during the initial calibration.

10.9.2 Calculate the concentration of each analyte and EIS in the CCV. The calculated amount for each analyte for medium level CCVs must be within ± 30% of the true value with an allowance of 10% of the reported analytes to be greater than 30%, but less than 40%. The calculated amount for each EIS must be within ± 50% of the true value. The calculated amount for the lowest calibration point for each analyte must be within ± 50%. If these conditions do not exist, then all data for the problem analyte must be considered invalid, and remedial action should be taken (Sect. 10.7.4) which may require recalibration. Any Field or QC Samples that have been analyzed since the last acceptable calibration verification should be reanalyzed after adequate calibration has been restored, with the following exception. **If the CCV fails because the calculated concentration is greater than 130% (150% for the low-level CCV) for a particular method analyte, and Field Sample extracts show no detection for that method analyte, non-detects may be reported without re-analysis.**

10.9.3 REMEDIAL ACTION – Failure to meet CCV QC performance criteria may require remedial action. Major maintenance, such as cleaning the electrospray probe, atmospheric pressure ionization source, cleaning the mass analyzer, replacing the LC column, etc., requires recalibration (Sect 10.6) and verification of sensitivity by analyzing a CCV at or below the RL (Sect 10.7).

10.10 EXTRACT ANALYSIS

10.10.1 Establish operating conditions equivalent to those summarized in Tables 6-8 of Section 16. Instrument conditions and columns should be optimized prior to the initiation of the IDC.

10.10.2 Establish an appropriate retention time window for each analyte. This should be based on measurements of actual retention time variation for each method analyte in CAL standard solutions analyzed on the LC over the course of time. A value of plus or minus three times the standard deviation of the retention time obtained for each method analyte while establishing the initial calibration and completing the IDC can be used to calculate a suggested window size. However, the experience of the analyst should weigh heavily on the determination of the appropriate retention window size.

10.10.3 Calibrate the system by either the analysis of a calibration curve (Sect. 10.6) or by confirming the initial calibration is still valid by analyzing a CCV as described in Section 10.7. If establishing an initial calibration, complete the IDC as described in Section 13.2.

10.10.4 Begin analyzing Field Samples, including QC samples, at their appropriate frequency by injecting the same size aliquots under the same conditions used to analyze the CAL standards.

10.10.5 At the conclusion of data acquisition, use the same software that was used in the calibration procedure to identify peaks of interest in predetermined retention time windows. Use the data system software to examine the ion abundances of the peaks in the chromatogram. Identify an analyte by comparison of its retention time with that of the corresponding method analyte peak in a reference standard.

10.10.6 The analyst must not extrapolate beyond the established calibration range. If an analyte peak area exceeds the range of the initial calibration curve, the sample should be re-extracted with a reduced sample volume in order to bring the out of range target analytes into the calibration range. If a smaller sample size would not be representative of the entire sample, the following options are recommended. Re-extract an additional aliquot of sufficient size to insure that it is representative of the entire sample. Spike it with a higher concentration of internal standard. Prior to LC/MS analysis, dilute the sample so that it has a concentration of internal standard equivalent to that present in the calibration standard. Then, analyze the diluted extract.

11. Data Evaluation, Calculations and Reporting

11.1 Complete chromatographic resolution is not necessary for accurate and precise measurements of analyte concentrations using MS/MS. In validating this method, concentrations were calculated by measuring the product ions listed in Table 7.

11.2 Calculate analyte concentrations using the multipoint calibration established in Section 10.6. Do not use daily calibration verification data to quantitate analytes in samples. Adjust final analyte concentrations to reflect the actual sample volume determined in Section 10.6 where:

C_{ex} = (Area of target analyte * Concentration of Labeled analog) / (area of labeled analog * CF)

C_s = (C_{ex} / sample volume in ml) * 1000

C_{ex} = The concentration of the analyte in the extract
CF = calibration factor from calibration.

11.3 Prior to reporting the data, the chromatogram should be reviewed for any incorrect peak identification or poor integration.

11.4 PFHxS, PFOS, PFOA, NMeFOSAA, and NEtFOSAA have multiple chromatographic peaks using the LC conditions in Table 5 due to the linear and branch isomers of these compounds (Sect. 10.6.4.1). The areas of all the linear and branched isomer peaks observed in the CAL standards for each of these analytes must be summed and the concentrations reported as a total for each of these analytes.

11.5 Calculations must utilize all available digits of precision, but final reported concentrations should be rounded to an appropriate number of significant figures (one digit of uncertainty), typically two, and not more than three significant figures.

12. Contingencies for Handling Out-of-Control Data or Unacceptable Data

12.1 Section 9.0 outlines sample batch QC acceptance criteria. If non-compliant organic compound results are to be reported, the Organic Section Head and/or the Laboratory Director, and the Operations Manager must approve the reporting of these results. The laboratory Project Manager shall be notified, and may choose to relay the non-compliance to the client, for approval, or other corrective action, such as re-sampling and re-analysis. The analyst, Data Reviewer, or Department Supervisor performing the secondary review initiates the project narrative, and the narrative must clearly document the non-compliance and provide a reason for acceptance of these results.

12.2 All results for the organic compounds of interest are reportable without qualification if extraction and analytical holding times are met, preservation requirements (including cooler temperatures) are met, all QC criteria are met, and matrix interference is not suspected during extraction or analysis of the samples. If any of the below QC parameters are not met, all associated samples must be evaluated for re-extraction and/or re-analysis.

13. Method Performance

13.1 Detection Limit Study (DL) / Limit of Detection Study (LOD) / Limit of Quantitation (LOQ)

13.1.1 The laboratory follows the procedure to determine the DL, LOD, and/or LOQ as outlined in Alpha SOP ID 1732. These studies performed by the laboratory are maintained on file for review.

13.2 Demonstration of Capability Studies

13.2.1 The IDC must be successfully performed prior to analyzing any Field Samples. Prior to conducting the IDC, the analyst must first generate an acceptable Initial Calibration following the procedure outlined in Section 10.6.

13.2.2 INITIAL DEMONSTRATION OF LOW SYSTEM BACKGROUND – Any time a new lot of SPE cartridges, solvents, centrifuge tubes, disposable pipets, and autosampler vials are used, it must be demonstrated that an MB is reasonably free of contamination and that the criteria in Section 9.2.1 are met. If an automated extraction system is used, an MB should be extracted on each port to ensure that all the valves and tubing are free from potential PFAS contamination.

13.2.3 INITIAL DEMONSTRATION OF PRECISION (IDP) – Prepare, extract, and analyze four to seven replicate LCSs fortified near the midrange of the initial calibration curve according to the procedure described in Section 10. Sample preservatives as described in Section 6.2.1 must be added to these samples. The relative standard deviation (RSD) of the results of the replicate analyses must be less than 20%.

13.2.4 INITIAL DEMONSTRATION OF ACCURACY (IDA) – Using the same set of replicate data generated for Section 13.2.3, calculate average recovery. The average recovery of the replicate values must be within ± 30% of the true value.

13.2.5 INITIAL DEMONSTRATION OF PEAK ASYMMETRY FACTOR – Peak asymmetry factors must be calculated using the equation in Section 9.10.1 for the first two eluting peaks (if only two analytes are being analyzed, both must be evaluated) in a mid-level CAL standard. The peak asymmetry factors must fall in the range of 0.8 to 1.5. See guidance in Section 10.6.4.1 if the calculated peak asymmetry factors do not meet the criteria.

13.2.6 Refer to Alpha SOP ID 1739 for further information regarding IDC/DOC Generation.

13.2.7 The analyst must make a continuing, annual, demonstration of the ability to generate acceptable accuracy and precision with this method.

14. Pollution Prevention and Waste Management

14.1 Refer to Alpha's Chemical Hygiene Plan and Hazardous Waste Management and Disposal SOP for further pollution prevention and waste management information.

14.2 This method utilizes SPE to extract analytes from water. It requires the use of very small volumes of organic solvent and very small quantities of pure analytes, thereby minimizing the potential hazards to both the analyst and the environment as compared to the use of large volumes of organic solvents in conventional liquid-liquid extractions.

14.3 The analytical procedures described in this method generate relatively small amounts of waste since only small amounts of reagents and solvents are used. The matrices of concern are finished drinking water or source water. However, laboratory waste management practices must be conducted consistent with all applicable rules and regulations, and that laboratories protect the air, water, and land by minimizing and controlling all releases from fume hoods and bench operations. Also, compliance is required with any sewage discharge permits and regulations, particularly the hazardous waste identification rules and land disposal restrictions.

15. Referenced Documents

Chemical Hygiene Plan – ID 2124

SOP ID 1732 Detection Limit (DL), Limit of Detection (LOD) & Limit of Quantitation (LOQ) SOP

SOP ID 1739 Demonstration of Capability (DOC) Generation SOP

SOP ID 1728 Hazardous Waste Management and Disposal SOP

16. Attachments

Table 7: LC Method Conditions

Time (min)	2 mM Ammonium Acetate (5:95 MeOH/H_2O)	100% Methanol
Initial	100.0	0.0
1.0	100.0	0.0
2.2	85.0	15.0
11	20.0	80.0
11.4	0.0	100.0
12.4	100.0	00.0
15.5	100.0	0.0
Waters Aquity UPLC ® BEHC_{18} 2.1 x 50 mm packed with 1.7 µm BEH C_{18} stationary phase Flow rate of 0.4 mL/min 2-5 µL injection		

Table 8: ESI-MS Method Conditions

ESI Conditions	
Polarity	Negative ion
Capillary needle voltage	.5 kV
Cone Gas Flow	25 L/hr
Nitrogen desolvation gas	1000 L/hr
Desolvation gas temp.	500 ºC

Table 9: Method Analyte Source, Retention Times (RTs), and EIS References

#	Analyte	Transition	RT	IS	Type
1	M3PBA	216>171	2.65		REC
2	PFBA	213 > 169	2.65	2: M4PFBA	
3	M4PFBA	217 > 172	2.65	1: M3PBA	EIS
4	PFPeA	263 > 219	5.67	4: M5PFPEA	
5	M5PFPEA	268 > 223	5.66	1: M3PBA	EIS
6	PFBS	299 > 80	6.35	6: M3PFBS	
7	M3PFBS	302 > 80	6.35	29:M4PFOS	EIS
8	FtS 4:2	327 > 307	7.47	9: M2-4:2FTS	

#	Analyte	Transition	RT	IS	Type
9	M2-4:2FTS	329 > 81	7.47	29:M4PFOS	EIS
10	PFHxA	303 > 269	7.57	10: M5PFHxA	
11	M5PFHxA	318 > 273	7.57	19:M2PFOA	EIS
12	PFPeS	349 > 80	7.88	18: M3PFHxS	
13	PFHpA	363 > 319	8.80	14: M4PFHpA	
14	M4PFHpA	367 > 322	8.80	19:M2PFOA	EIS
15	L-PFHxS	399 > 80	8.94	18: M3PFHxS	
16	br-PFHxS	399 > 80	8.72	18: M3PFHxS	
17	PFHxS Total	399 > 80	8.94	18: M3PFHxS	
18	M3PFHxS	402 > 80	8.94	29:M4PFOS	EIS
19	MPFOA	415 > 370	9.7		REC
20	PFOA	413 > 369	9.7	23: M8PFOA	
21	br-PFOA	413 > 369	9.48	23: M8PFOA	
22	PFOA Total	413 > 369	9.7	23: M8PFOA	
23	M8PFOA	421 > 376	9.7	19: M2PFOA	EIS
24	FtS 6:2	427 > 407	9.66	25: M2-6:2FTS	
25	M2-6:2FTS	429 > 409	9.66	29:M4PFOS	EIS
26	PFHpS	449 > 80	9.78	33: M8PFOS	
27	PFNA	463 > 419	10.41	33: M8PFOS	
28	M9PFNA	472 > 427	10.41	19: M2PFOA	EIS
29	M4PFOS	501 > 80	10.45		REC
30	PFOS	499 > 80	10.45	33: M8PFOS	
31	br-PFOS	499 > 80	10.27	33: M8PFOS	
32	PFOS Total	499 > 80	10.45	33: M8PFOS	
33	M8PFOS	507 > 80	10.45	29: M4PFOS	EIS
34	FtS 8:2	527 > 507	10.99	38: M2-8:2FTS	
35	M2-8:2FTS	529 > 509	10.99	29:M4PFOS	EIS
36	M2PFDA	515 > 470	11.00		REC
37	PFDA	513 > 469	11.00	38: M6PFDA	
38	M6PFDA	519 > 474	11.00	36: M2PFDA	EIS
39	PFNS	549 > 80	11.02	33:M8PFOS	
40	NMeFOSAA	570 > 419	11.41	41: D3-NMeFOSAA	
41	d3-NMeFOSAA	573 > 419	11.41	36: M2PFDA	EIS
42	PFOSA	498 > 78	11.48	29: M8FOSA	
43	M8FOSA	506 > 78	11.48	19: M2PFOA	EIS
44	PFUnDA	563 > 519	11.51	41: M7-PFUDA	
45	M7-PFUDA	570 > 525	11.51	36: M2PFDA	EIS
46	PFDS	599 > 80	11.51	33:M8PFOS	
47	NEtFOSAA	584 > 419	11.68	48: d5-NEtFOSAA	

#	Analyte	Transition	RT	IS	Type
48	d5-NEtFOSAA	589 > 419	11.68	36: M2PFDA	EIS
49	PFDoA	613 > 569	11.96	50: MPFDOA	
50	MPFDOA	615 > 570	11.96	36: M2PFDA	EIS
51	PFTriA	663 > 619	12.34	50: MPFDOA	
52	PFTeA	713 > 669	12.6	53: M2PFTEDA	
53	M2PFTEDA	715 > 670	12.6	36: M2PFDA	EIS
54	M3HFPO-DA	329>285	7.97	19: M2PFOA	EIS
55	HFPO-DA	332>287	7.97	54: M3HFPO-DA	
56	ADONA	377>251	8.00	23: M8PFOA	
57	PFHxDA	813>769	13.20	59: M2PFHxDA	
58	PFODA	913>869	13.50	59: M2PFHxDA	
59	M2PFHxDA	815>770	13.20	36:M2PFDA	EIS
60	NEtFOSA	526>169	11.00	61: NMeFOSA	
61	NMeFOSA	512>169	10.50	63: d3-NMeFOSA	
62	d3-NMeFOSA	515>169	10.50	29: M4PFOS	EIS
63	d5-NEtFOSA	531>169	11.00	29: M4PFOS	EIS
64	NMeFOSE	556>122	11.25	66: d7-NMeFOSE	
65	NEtFOSE	570>136	10.75	67: d9-NEtFOSE	
66	d7-NMeFOSE	563>126	11.25	29: M4PFOS	EIS
67	d9-NEtFOSE	579>142	10.75	29: M4PFOS	EIS
68	FtS 10:2	627>607	11.50	25: M2-6:2FTS	
69	PFDoS	699>99	12.50	33: M8PFOS	

APPENDIX G
HEALTH AND SAFETY PLAN

WILLIAMSBRIDGE GARDENS
EAST 211TH – EAST 212TH STREET
BRONX, NEW YORK
NYSDEC BCP ID: C203113

HEALTH & SAFETY PLAN

SUBMITTED TO:

New York State Department of Environmental Conservation
Region 2
47-40 21st Street
Long Island City, New York 11101

PREPARED FOR:

B&B Urban, LLC
419 Park Avenue South, 7th Floor
New York, New York 10016

PREPARED BY:

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PWGC Project Number: BBU1702

JANUARY 2019

HEALTH & SAFETY PLAN
WILLIAMSBRIDGE GARDENS
NYSDEC BCP ID: C203113

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P.W. GROSSER CONSULTING, INC.
PROJECT No. BBU1801
New York State Department of Environmental Conservation
Brownfield Site No. C203113

HEALTH AND SAFETY PLAN

Williamsbridge Gardens
East 211th – East 212th Street
Bronx, New York

SUBMITTED:

January 2019

PREPARED FOR:

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

ON BEHALF OF:

B&B Urban LLC
419 Park Avenue South, 7th Floor
New York, New York 10019

PREPARED BY:

P.W. Grosser Consulting, Inc.
630 Johnson Avenue, Suite 7
Bohemia, New York 11716

1.0 STATEMENT OF COMMITMENT

On-site employees may be exposed to risks from hazardous conditions related to Remedial Investigation (RI) activities to be performed at the Williamsbridge Gardens project site. P.W. Grosser Consulting Inc.'s (PWGC's) policy is to minimize the possibility of work-related injury through awareness and qualified supervision, health and safety training, medical monitoring, use of appropriate personal protective equipment, and the following activity specific safety protocols contained in this Health and Safety Plan (HASP). PWGC has established a guidance program to implement this policy in a manner that protects personnel to the maximum reasonable extent.

This HASP, which applies to PWGC personnel actually or potentially exposed to safety or health hazards, describes emergency response procedures for actual and potential physical and chemical hazards. This HASP is also intended to inform and guide personnel entering site work zones. Persons are to acknowledge that they understand the potential hazards and the contents of this Health and Safety policy by signing off on receipt of their individual copy of the document. Contractors and suppliers are retained as independent contractors and are responsible for ensuring the health and safety of their own employees.

PWGC may require that its personnel take certain precautions in accordance with this HASP, and PWGC requests that others protect their personnel in a manner that they deem necessary or sufficient.

2.0 INTRODUCTION AND SITE ENTRY REQUIREMENTS

This document describes the health and safety guidelines developed by PWGC at the request of the "Volunteer" for the proposed RI to be performed at the Williamsbridge Gardens project site ("the site") to protect on-site personnel, visitors, and the public from physical harm and exposure to hazardous materials or wastes. In accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 Hazardous Waste Operations and Emergency Response (HAZWOPER) Final rule, this HASP, including the attachments, addresses safety and health hazards relating to each phase of site operations and is based on the best information available. The HASP may be revised by PWGC at the request of the Volunteer, and/or regulatory agency upon receipt of new information regarding site conditions. Changes will be documented by written amendments signed by PWGC's project director, project manager and/or site safety officer.

2.1 Training Requirements

Personnel entering the exclusion zone or decontamination zone must meet the training requirements for hazardous waste site operations and emergency response operations in accordance with OSHA 29 CFR 1910.120(e).

Each subcontractor and supplier working on the job must provide the site safety officer with training documentation for its personnel upon request.

2.2 Medical Monitoring Requirements

PWGC personnel and visitors entering the exclusion zone or decontamination zone must have completed appropriate medical monitoring required under OSHA 29 CFR 1910.120(f). Medical monitoring enables a physician to monitor each employee's health, physical condition, and his fitness to wear respiratory protective equipment and carry out on-site tasks.

Evidence of compliance with additional medical monitoring requirements for this site must also be included upon request.

2.3 Fit Test Requirements

Personnel and visitors entering a work zone using a negative pressure air purifying respirator (APR) must have successfully passed a qualitative respirator fit test in accordance with OSHA 29 CFR 1910.134 or the American National Standards Institute (ANSI).

Fit testing documentation is the responsibility of each subcontractor. Documentation of PWGC's personnel fit-testing is maintained on file. PWGC does not anticipate the need for work to be performed using APR's.

2.4 Site Safety Plan Acceptance, Acknowledgement and Amendments

The project superintendent and the site safety officer are responsible for informing personnel (P.W. Grosser employees and/or owner or owners representatives) entering a work area of the contents of this plan and ensuring that each person signs the safety plan acknowledging the on-site hazards and procedures required to minimize exposure to adverse effects of these hazards. A copy of the Acknowledgement Form is included in **Appendix A**.

Site conditions may warrant an amendment to the HASP. Amendments to the HASP are acknowledged by completing forms included in **Appendix B**.

2.5 Daily Safety Meetings

Each day before work begins; the site safety officer will hold safety (tailgate or tool box) meetings to ensure that on-site personnel understand the site conditions and operating procedures and to address safety questions and concerns. Meeting minutes and attendance will be recorded. Personnel eligible to enter a work zone must attend the meetings. Project staff will discuss and remedy health and safety issues at these meetings.

2.6 Key Personnel – Roles and Responsibilities

The following PWGC key personnel are planned for this project:

- PWGC Project Director — Mr. James Rhodes
- PWGC Project Manager — Mr. Thomas Melia
- PWGC Site Safety Officer — Ms. Janelle Cooley, or assignee

The PWGC project manager is responsible for overall project administration and, with guidance from the PWGC site safety officer, for supervising the implementation of this HASP. The site safety officer will conduct daily (tail gate or tool box) safety meetings at the project site and oversee daily safety issues. Each subcontractor and supplier (defined as an OSHA employer) is also responsible for the health and safety of its employees. If there is any dispute about health and safety or project activities, on-site personnel will attempt to resolve the issue. If the issue cannot be resolved at the site, then the project manager will be consulted.

The PWGC site safety officer is also responsible for coordinating and enforcing health and safety activities on-

site. The site safety officer must meet the emergency response and hazardous materials training requirements of OSHA 29 CFR Part 1910.120; must have completed OSHA supervisor training, 29 CFR 1910.120 (e) 4; and must have appropriate experience to the related site work. The site safety officer is authorized to suspend the site work based on safety concerns, and is responsible for the following:

1. Educating personnel about information in this HASP and other safety requirements to be observed during site operations, including, but not limited to, decontamination procedures, designation of work zones and levels of protection, air monitoring, fit testing, and emergency procedures dealing with fire and first aid.
2. Coordinating site safety decisions with the project manager.
3. Designating exclusion, decontamination and support zones (work zones) on a daily basis.
4. Monitoring the condition and status of known on-site hazards and maintaining and implementing the air quality monitoring program specified in this HASP.
5. Maintaining the work zone entry/exit log and site entry/exit log.
6. Maintaining records of safety problems, corrective measures and documentation of chemical exposures or physical injuries (the site safety officer will document these conditions in a bound notebook and maintain a copy of the notebook on-site).

The person who observes safety concerns and potential hazards that have not been addressed in the daily safety meetings should immediately report their observations/concerns to the site safety officer or appropriate key personnel.

3.0 SITE BACKGROUND AND SCOPE OF WORK

The Site is located in the Williamsbridge section of the Borough of The Bronx and is identified as Block 4657, Lots 42, 67, 69, 71, and 72. Currently, the Site is a vacant lot used for the storage of carnival rides and equipment. One small storage building is present.

Proposed redevelopment of the site consists of construction of two new eight-story residential buildings with partial basements at the site. Building footprints are expected to cover the majority of the site. Preliminary development plans include excavation for the basement areas to approximately 12 feet below ground surface (bgs) for the floor slab, and approximately 16 feet bgs for footings.

PWGC prepared a Phase I Environmental Site Assessment (ESA) in August 2017. The Phase I ESA identified the following Recognized Environmental Conditions (RECs) associated with the subject property:

- The site has been assigned an E-Designation for Hazardous Materials by the New York City Department of Planning.
- Chemical drums and containers were stored throughout the property. Staining and evidence of spillage was noted in the vicinity of these containers.
- Potential vapor encroachment related to offsite sources.

Based on the Phase I ESA, PWGC performed a Phase II ESA at the site in January 2018. The Phase II ESA identified the following:

- Based on a geophysical survey no underground storage tanks (USTs) or other subsurface anomalies were identified at the site.
- VOCs, SVOCs, metals, pesticides and PCBS were detected at concentrations exceeding NYSDEC Unrestricted Use Soil Cleanup Objectives (UUSCOs) in soils at the site.
- Groundwater was not encountered during the Phase II ESA. As such, groundwater quality beneath the site is currently unknown.
- Soil vapor beneath the site was not impacted at levels that would require vapor mitigation, based on comparison to NYSDOH Decision Matricies.

4.0 HAZARD ASSESSMENT

This section identifies the hazards associated with the proposed scope of work, general site operations which may also be conducted at site, and the standard operating procedures (SOPs) that should be implemented to reduce the hazards; identifies general physical hazards that can be expected at most sites; and presents a summary of documented or potential chemical hazards at the site. Every effort must be made to reduce or eliminate these hazards. Those that cannot be eliminated must be guarded against using engineering controls and/or personal protective equipment.

4.1 Activity-Specific Hazards and Standard Operating Procedures

4.1.1 Drilling and Probing Operations

Soil borings and/or groundwater monitoring wells using Geoprobe® direct push technology and/or rotary drilling technology will be installed as part of the proposed subsurface investigation. PWGC and/or subcontractors shall follow the standard drilling protocols included as **Appendix C**.

4.1.2 Work in Extreme Temperatures

Work under extremely hot or cold weather conditions requires special protocols to minimize the chance that employees will be affected by heat or cold stress. As necessary, PWGC shall follow the heat and cold stress safety protocols included as **Appendix D**.

4.1.3 Dust Control and Monitoring

Dust generated during work activities may contain contaminants associated with the site characteristics. Dust generation is not anticipated during the subsurface investigation. In the event that fugitive dust is generated, PWGC shall control the dust by wetting the working surface with water, or other approved method of dust suppression.

4.2 Chemical Hazards

Historic environmental investigations at the subject site have identified elevated VOCs, SVOCs, metals, pesticides and PCBs in soils at the site. The primary routes of exposure to contaminants in soil are inhalation, ingestion and absorption.

Appendix E includes information sheets for the potential chemicals that may be encountered at the site.

4.2.1 Respirable Dust

The subsurface investigation activities are not anticipated to generate particulate dust; however dust may be generated from vehicular traffic and/or other construction activities. If visible observation detects elevated

levels of dust, a program of wetting will be employed by the site safety officer. If elevated dust levels persist, the site safety office will employ dust monitoring using a particulate monitor (Miniram or equivalent). If monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

Absorption pathways for dust and direct contact with soils will be mitigated with the implementation of latex gloves, hand washing and decontamination exercises when necessary.

4.2.2 Organic Vapors

Based upon historical environmental investigations, the potential for isolated areas of VOCs impacts exists. Therefore, drilling/excavation activities may cause the release of organic vapors to the atmosphere. The site safety officer will monitor organic vapors with a Photoionization Detector (PID) during drilling activities to determine whether organic vapor concentrations exceed action levels shown below.

PID Response	Action
Sustained readings of 5 ppm or greater	Shut down drilling equipment and allow area to vent. Resume when readings return to background
Sustained readings of 5 ppm or greater that do not subside after venting	Implement Vapor Release Plan (Section 9.8). Re-evaluate respiratory protection as upgrade may be required.

4.3 General Site Hazards

Applicable OSHA 29 CFR 1910.120(m) standards for illumination shall apply. Work is to be conducted during daylight hours whenever possible.

Electrical power must be provided through a ground fault circuit interrupter. Equipment that will enter an excavation must be suitable and approved (i.e. intrinsically safe) for use in potentially explosive environments. Applicable OSHA 29 CFR 1926 Subpart K standards for use of electricity shall apply.

Work where there is a fall hazard will be performed using appropriate ladders and/or protection (e.g. body harness and lifeline). All work should be conducted at the ground surface or in trench excavations.

In accordance with 29 CFR 1910.151(c), workers involved in operations where there is the risk of eye injury, (chemical splash, etc.), must have ready access to an approved eye wash unit. Protective eye wear shall be

donned in Level D, when directed by the site safety officer.

Operations where there is a potential for fire will be conducted in a manner that minimizes risk. Non-sparking tools and fire extinguishers shall be used or available as directed by the site safety officer when work is in potentially explosive atmospheres. Ignition sources shall be removed from work areas. Explosion-proof instruments and/or bonding and grounding will be used to prevent fire or explosion when the site safety officer directs their use.

Overhead and underground utilities shall be identified and/or inspected and appropriate safety precautions taken before conducting operations where there is potential for contact or interference.

5.0 PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) shall be selected in accordance with the site air monitoring program, OSHA 29 CFR 1910.120(c), (g), and 1910.132. Protective equipment shall be NIOSH-approved and respiratory protection shall conform to OSHA 29 CFR Part 1910.133 and 1910.134 specifications; head protection shall conform to 1910.135; eye and face protection shall conform to 1910.133; and foot protection shall conform to 1910.136. The only true difference among the levels of protection from D thru B is the addition of the type of respiratory protection.

PWGC anticipates that work performed under the scope of the proposed Phase II investigation will be conducted in Level D PPE.

5.1 Level D

Level D PPE shall be donned when the atmosphere contains no known hazards and work functions preclude splashes, immersion, or the potential for inhalation of, or contact with, hazardous concentrations of harmful chemicals. Level D PPE consists of:

- Standard work uniform, coveralls, or Tyvek (as needed).
- Steel toe and steel shank work boots (or equivalent).
- Hard hat.
- Gloves (as needed).
- Safety glasses.
- Hearing protection (as needed)
- Equipment replacements are available as needed.

5.2 Level C

Level C PPE shall be donned when the concentrations of measured total organic vapors in the breathing zone exceed background concentrations (using a portable PID, or equivalent), but are less than 5 ppm. The specifications on the APR filters used must be appropriate for contaminants identified or expected to be encountered. Level C PPE shall be donned when the identified contaminants have adequate warning properties and criteria for using APR have been met. Level C PPE consists of:

- Chemical resistant or coated Tyvek coveralls.
- Steel toe and steel shank work boots (or equivalent).
- Chemical resistant over boots or disposable boot covers.

- Disposable inner gloves (surgical gloves).
- Disposable outer gloves.
- Full-face APR fitted with organic vapor/dust and mist filters or filters appropriate for the identified or expected contaminants.
- Hard hat.
- Splash shield (as needed)
- Ankles/wrists taped with duct tape.

The site safety officer will verify if Level C is appropriate by checking organic vapor concentrations using compound and/or class-specific detector tubes.

5.3 Level B

Level B PPE shall be donned when the contaminants have not been identified and/or the concentrations of unknown measured total organic vapors in the breathing zone exceed 5 ppm (using a portable OVA, or equivalent). Level B PPE shall be donned if the IDLH of a known contaminant is exceeded. If a contaminant is identified or is expected to be encountered for which NIOSH and/or OSHA recommend the use of a positive pressure self-contained breathing apparatus (SCBA) when that contaminant is present, Level B PPE shall be donned even though the total organic vapors in the breathing zone may not exceed 5 ppm. Level B shall be donned for confined space entry, and when the atmosphere is oxygen deficient (oxygen less than 19.5%) or potentially oxygen deficient. If Level B PPE is required for a task, at least three people shall be donned in Level B at any one time during that task. PPE shall only be donned at the direction of the site safety officer. Level B PPE consists of:

- Supplied air SCBA or air line system with five minute egress system.
- Chemical resistant or coated Tyvek coveralls.
- Steel toe and steel shank work boots (or equivalent).
- Chemical resistant over boots or disposable boot covers.
- Disposable inner gloves (surgical gloves).
- Disposable outer gloves.
- Hard hat.
- Ankles/wrists taped with duct tape.

The exact PPE ensemble is decided on a site-by-site basis by the PWGC Health and Safety Officer with the intent to provide the most protective and efficient worker PPE.

5.4 Activity Specific Levels of Personal Protection

The required level of PPE is activity-specific and is based on air monitoring results (Section 7.0) and properties of identified or expected contaminants. It is expected that all site work will be performed in Level D. If air monitoring results indicate the necessity to upgrade the level of protection engineering controls (i.e. Facing equipment away from the wind and placing site personnel upwind of excavations, active venting, etc.) will be implemented before requiring the use of respiratory protection.

6.0 DECONTAMINATION PROCEDURES

Equipment and PPE exiting the exclusion zone must be decontaminated or properly discarded upon exit. Personnel must enter and exit the exclusion zone through the decontamination area. The exclusion and decontamination zones may change depending on the nature of the site work. Plastic bags containing personal protective clothing and equipment will be placed in designated receptacles.

Boots and other potentially contaminated garments that have come in contact with hazardous materials will be cleaned in wash tubs with detergent/water solution and rinsed with water and must remain on site. The wash water, rinse water, and residues will be collected and properly stored until sampling results are received and the final method of disposal can be determined. Disposable PPE, including spent respirator cartridges and canisters, will be properly bagged and disposed. Contaminated boots, clothing, and equipment (e.g. leather boots, equipment carrying straps) that cannot be decontaminated will be disposed of with the disposable garments or left on site in the decontamination area.

The ***minimum*** measures for Level B doffing and decontamination are:

1. Deposit equipment on plastic drop cloths.
2. Scrub outer boots and gloves with a water and detergent solution and rinse.
3. Remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided.
4. Remove SCBA and face piece and place on rack provided.
5. Remove Tyvek/outer garment and place in receptacle provided.
6. Remove inner gloves and deposit in receptacle provided.
7. Shower/wash face and hands.

The ***minimum*** measures for Level C doffing and decontamination are:

1. Deposit equipment on plastic drop cloths.
2. Scrub outer boots and gloves (if worn) with a water and detergent solution and rinse.
3. Remove outer boots and outer gloves. Discard disposable outer garments in receptacle provided.
4. Remove Tyvek/outer garment and place in receptacle provided.
5. Remove first pair of inner gloves.
6. Remove respirator (using "clean" inner gloves) and place on rack provided.
7. Remove last pair of inner gloves and deposit in receptacle provided.

8. Shower/wash face and hands.

The second to last item to be removed is the APR, and the last item to be removed is the last of several pairs of surgical gloves. Wearing several pairs of inner gloves permits layers to be removed as needed during various stages of the doffing procedure, and if the APR inadvertently becomes contaminated, inner gloves guard against bare hands contacting the APR.

Equipment that comes into contact with site contaminants is decontaminated according to manufacturer specifications. Decontamination is done in the exclusion or decontamination zones. Rented equipment is photographed after decontamination.

7.0 AIR MONITORING AND ACTION LEVELS

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

Perimeter air monitoring will be performed in accordance with the Community Air Monitoring Plan (CAMP) for the site included as Appendix E of the RI Work Plan. Air monitoring will be performed for protection for on-site workers as described below.

7.1 Work Zone Monitoring

Respirable dust will be monitored using a MiniRAM Model PDM-3 aerosol monitor (or equivalent) and air will be monitored for VOCs with a MiniRAE 2000 PID (or equivalent) during intrusive activities such as excavation and drilling. Monitoring will be performed continuously during intrusive activities and hourly, at a minimum, otherwise. Upwind readings will be recorded at least twice daily to determine background concentrations at the site.

Monitoring Instrument	**Monitoring Location**	**Monitoring Frequency**	**Action Level (above background)**	**Action**
PID	Work Area	Continuous during intrusive activities; hourly, at a minimum, otherwise	<5ppm* ≥5ppm, ≤50ppm* >50ppm*	Level D PPE, continue work Level C PPE, notify PM/HSM Stop work, notify PM/HSM
Particulate monitor	Work Area	Continuous during intrusive activities; hourly, at a minimum, otherwise	≤150 µg/m3 >150 µg/m3	Continue work Take corrective actions (see below)
*Sustained levels in the breathing zone for a minimum of 5 minutes				

If particulate monitoring detects concentrations greater than 150 µg/m3 over daily background, the site safety officer will take corrective actions as defined herein, including the use of water for dust suppression and if this

is not effective, requiring workers to wear APRs with efficiency particulate air (HEPA) cartridges.

7.2 Air Monitoring Recordkeeping

The field team lead will document air monitoring data in a log book. Data will include instrument used, calibration date, wind/weather conditions and work activities.

7.3 Calibration Requirements

The PID will be calibrated daily, prior to the start of work. Calibration details (i.e., date, time, span gas, etc…) will be recorded in a log book.

8.0 SITE CONTROL

8.1 Work Zones

The primary purpose of site controls is to establish the perimeter of a hazardous area, to reduce the migration of contaminants into clean areas, and to prevent access or exposure to hazardous materials by unauthorized persons. When operations are to take place involving hazardous materials, the site safety officer will establish an exclusion zone, a decontamination zone, and a support zone. These zones "float" (move around the site) depending on the tasks being performed on any given day. The site safety officer will outline these locations before work begins and when zones change. The site safety officer records this information in the site log book. It is expected that for subsurface investigation activities, identification of an exclusion zone, decontamination zone, and support zone will not be necessary.

Tasks requiring OSHA 40-hour Hazardous Waste Operations and Emergency Response Operations training are carried out in the exclusion zone. The exclusion zone is defined by the site safety officer but will typically be a 50-foot area around work activities. Gross decontamination (as determined by the site Health and Safety Officer) is conducted in the exclusion zone; all other decontamination is performed in the decontamination zone or trailer.

Protective equipment is removed in the decontamination zone. Disposable protective equipment is stored in receptacles staged in the decontamination zone, and non-disposable equipment is decontaminated. All personnel and equipment exit the exclusion zone through the decontamination zone. If a decontamination trailer is provided the first aid equipment, an eye wash unit, and drinking water are kept in the decontamination trailer.

The support zone is used for vehicle parking, daily safety meetings, and supply storage. Eating, drinking, and smoking are permitted only in the support zone. When a decontamination trailer is not provided, the eye wash unit, first aid equipment, and drinking water are kept at a central location designated by the site safety officer.

8.2 General Field Safety and Standard Operating Procedures

PWGC's policy is to control hazards at all site areas by limiting entrance to exclusion zones to essential personnel and by implementing the following rules:

- Non-essential (as judged by the site safety officer) personnel and unauthorized persons will not enter the exclusion or decontamination zone.

- Before entering the exclusion or decontamination zones, all personnel must be familiar with emergency response procedures (Section 9.0), site safety locations, first aid and communication equipment, and the location of the map to the hospital and the list of emergency telephone numbers.
- The buddy system will be used at all times by field personnel in the exclusion zone; no one is to perform work within the exclusion zone alone. When in Level D or C, visual contact or radio contact shall be maintained at all times.
- Contact with contaminated and potentially contaminated surfaces should be avoided. Walk around (not through) puddles and discolored surfaces. Do not kneel on the ground or place equipment on the ground. Protect equipment from contamination.
- Eating, drinking, or smoking is permitted only in designated areas in the support zone.

Each worker must be supplied with and maintain his/her own personal protective equipment.

9.0 CONFINED SPACE

OSHA published a Final Rule on permit-required confined spaces on January 14, 1993, for General Industry at 29 CFR 1910.146 et seq., with an implementation date of April 15, 1993. The rule specifically excludes agriculture, construction, or shipyard employment. Confined space entry and work within confined spaces is not anticipated to be performed under the proposed scope of work. However, if confined space work is conducted it will be performed in accordance with the applicable OSHA regulations. OSHA defines confined space as:

1. is large enough and so configured that an employee can bodily enter and perform assigned work;
2. has limited or restricted areas for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited entry); and
3. is not designed for continuous worker occupancy.

OSHA further requires that an "entry supervisor" (the site designated safety officer) decide at the time of entry whether the space is permit-required or non-permit required space. The site safety officer will monitor the space two hours prior to entry and continuously during work to ensure that the atmosphere is not hazardous. OSHA defines as hazardous atmosphere as:

1. Flammable gas, vapor, or mist in excess of 10 percent of its lower explosive limit (LEL);
2. Airborne combustible dust at a concentration that meets or exceeds its LEL;NOTE: This concentration may be approximated as a condition in which the dust obscures vision at a distance of 5 feet (1.52 m) or less.
3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent;
4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is published in Subpart G, Occupational Health and Environmental Control, or in Subpart Z. Toxic
5. and Hazardous Substances, of this part and which could result in employee exposure in excess of its dose or permissible exposure limit;
6. Any other atmospheric condition that is immediately dangerous to life or health.

A space is non-permit required if none of the above defined hazardous conditions are present. OSHA requires that an attendant (e.g., an individual stationed outside one or more spaces who monitors the entrants and who performs air monitoring of the space(s)) be assigned to each space. The attendant is not allowed to perform any direct rescue related duties, but is there to communicate with the entrant and call for rescue procedures if required.

The following protocol applies when PWGC employees must enter a confined space:

- The site safety officer evaluates the space and site conditions to determine whether the space must be considered "confined".
- If so, the site safety officer monitors the space for hazardous atmospheres prior to entry and fills out a pre-entry checklist (**Appendix F**) to determine whether an entry-permit is required.
- If there is no hazardous atmosphere, the space will be continuously monitored during the entry to assure that the atmosphere remains non-hazardous.
- If the space contains a hazardous atmosphere, an entry permit (**Appendix F**) will be prepared and the space will only be entered in accordance with 29 CFR 1910.146.

10.0 CONTINGENCY PLAN/EMERGENCY RESPONSE PLAN

Site personnel must be prepared in the event of an emergency. Emergencies can take many forms: illnesses, injuries, chemical exposure, fires, explosions, spills, leaks, releases of harmful contaminants, or sudden changes in the weather.

Emergency telephone numbers and a map to the hospital (Figure 1) will be posted in the command post. Site personnel should be familiar with the emergency procedures, and the locations of site safety, first aid, and communication equipment.

10.1 Emergency Equipment On-site

Private telephones:	Site personnel.
Two-way radios:	Site personnel where necessary.
Emergency Alarms:	On-site vehicle horns*.
First aid kits:	On-site, in vehicles or office.
Fire extinguisher:	On-site, in office or on equipment.

* Horns: Air horns will be supplied to personnel at the discretion of the project manager or site safety officer.

10.2 Emergency Telephone Numbers

General Emergencies - New York City Police/Fire Department/Ambulance	911
Non-Emergency Hotline - New York City Police/Fire Department/Ambulance	311
Local Emergency Medical Center (Bronx State Hospital)	1-718-882-3328
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994
NYC Office of Environmental Remediation	1-212-788-8841
NYC Department of Health	1-212-788-4711
PWGC Project Director, James Rhodes	1-631-589-6353
PWGC Project Manager, Thomas Melia	1-631-589-6353
PWGC Site Safety Officer, Janelle Cooley (or assignee)	1-516-967-7752

A copy of this page shall be posted in the office and a copy is provided in **Appendix G**.

10.3 Personnel Responsibilities During an Emergency

The project manager is primarily responsible for responding to and correcting any emergency situations. However, in the absence of the project manager, the site safety officer shall act as the project manager's on-site designee and perform the following tasks:

- Take appropriate measures to protect personnel including: withdrawal from the exclusion zone, evacuate and secure the site, or upgrade/downgrade the level of protective clothing and respiratory protection;
- Ensure that appropriate federal, state, and local agencies are informed and emergency response plans are coordinated. In the event of fire or explosion, the local fire department should be summoned immediately. If toxic materials are released to the air, the local authorities should be informed in order to assess the need for evacuation;
- Ensure appropriate decontamination, treatment, or testing for exposed or injured personnel;
- Determine the cause of incidents and make recommendations to prevent recurrence; and,
- Ensure that all required reports have been prepared.

The following PWGC key personnel are planned for this project:

- PWGC Project Director — Mr. James Rhodes
- PWGC Project Manager — Mr. Thomas Melia
- PWGC Site Safety Officer — Ms. Janelle Cooley, or assignee

10.4 Medical Emergencies

A person who becomes ill or injured in the exclusion zone will be decontaminated to the maximum extent possible. If the injury or illness is minor, full decontamination will be completed and first aid administered prior to transport. First aid will be administered while waiting for an ambulance or paramedics. A Field Accident Report (**Appendix G**) must be filled out for any injury.

A person transporting an injured/exposed person to a clinic or hospital for treatment will take the directions to the hospital and information on the chemical(s) to which they may have been exposed (**Appendix G**).

10.5 Fire or Explosion

In the event of a fire or explosion, the local fire department will be summoned immediately. The site safety officer or his designated alternate will advise the fire commander of the location, nature and identification of

the hazardous materials on-site. If it is safe to do so, site personnel may:

- use firefighting equipment available on site; or,
- remove or isolate flammable or other hazardous materials that may contribute to the fire.

10.6 Evacuation Routes

Evacuation routes established by work area locations for each site will be reviewed prior to commencing site operations. As the work areas change, the evacuation routes will be altered accordingly, and the new route will be reviewed.

Under extreme emergency conditions, evacuation is to be immediate without regard for equipment. The evacuation signal will be a continuous blast of a vehicle horn, if possible, and/or by verbal/radio communication.

- When evacuating the site, personnel will follow these instructions:
- Keep upwind of smoke, vapors, or spill location.
- Exit through the decontamination corridor if possible.
- If evacuation through the decontamination corridor is not possible, personnel should remove contaminated clothing once they are in a safe location and leave it near the exclusion zone or in a safe place.
- The site safety officer will conduct a head count to ensure that all personnel have been evacuated safely. The head count will be correlated to the site and/or exclusion zone entry/exit log.
- If emergency site evacuation is necessary, all personnel are to escape the emergency situation and decontaminate to the maximum extent practical.

10.7 Spill Control Procedures

Spills associated with site activities may be attributed to project specific heavy equipment and include gasoline, diesel and hydraulic oil. In the event of a leak or a release, site personnel will inform their supervisor immediately, locate the source of spillage and stop the flow if it can be done safely. A spill containment kit including absorbent pads, booms and/or granulated speedy dry absorbent material will be available to site personnel to facilitate the immediate recovery of the spilled material. Daily inspections of site equipment components including hydraulic lines, fuel tanks, etc. will be performed by their respective operators as a preventative measure for equipment leaks and to ensure equipment soundness. In the event of a spill, site personnel will immediately notify the NYSDEC (1-800-457-7362), and a spill number will be generated.

10.8 Vapor Release Plan

If work zone organic vapor (excluding methane) exceeds 5 ppm, then a downwind reading will be made either 200 feet from the work zone or at the property line, whichever is closer. If readings at this location exceed 5 ppm over background, the work will be stopped.

If 5 ppm of VOCs are recorded over background on a PID at the property line, then an off-site reading will be taken within 20 feet of the nearest residential or commercial property, whichever is closer. If efforts to mitigate the emission source are unsuccessful for 30 minutes, then the designated site safety officer will:

- contact the local police;
- continue to monitor air every 30 minutes, 20 feet from the closest off-site property. If two successive readings are below 5 ppm (non-methane), off-site air monitoring will be halted.
- All property line and off site air monitoring locations and results associated with vapor releases will be recorded in the site safety log book.

APPENDIX A
SITE SAFETY ACKNOWLEDGMENT FORM

PWGC
CLIENT DRIVEN SOLUTIONS

SITE SAFETY ACKNOWLEDGMENT FORM

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

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

Name (Print and Sign)	Date

APPENDIX B
SITE SAFETY PLAN AMENDMENTS

SITE SAFETY PLAN AMENDMENT FORM

SITE SAFETY PLAN AMENDMENT NUMBER: _____

SITE NAME: _____

REASON FOR AMENDMENT: _____

_____

_____

_____

_____

ALTERNATIVE PROCEDURES: _____

_____

_____

_____

_____

REQUIRED CHANGES IN PPE: _____

_____

_____

_____

_____

_____ _____

SITE SAFETY OFFICER DATE

_____ _____

PROJECT MANAGER DATE

_____ _____

PROJECT DIRECTOR DATE

APPENDIX C
DRILLING PROTOCOLS

SAFETY PROCEDURES DURING THE OPERATION OF DRILLING/PROBING MACHINESINCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

- All site personnel should know the location of the rig emergency shut-off switch prior to beginning operations.
- The rig should be inspected prior to operation to ensure that it is in proper working condition and that all safety devices are functioning.
- Each rig should have a first-aid kit and fire extinguisher which should be inspected to ensure that they are adequate.
- All operators should wear, at a minimum, hard hats, steel-toe safety shoes or boots, gloves and safety glasses. Additional clothing and protective equipment may be required at sites where hazardous conditions are likely. Clothing must be close fitting, without loose ends, straps, draw strings or belts or other unfastened parts that might catch on moving machinery.
- Work areas should be kept free of materials, debris and obstruction, and substances such as grease or oil that could cause a surface to become slick or otherwise hazardous.
- Prior to drilling, the site must be checked to determine whether it can accommodate the rig and supplies and provide a safe working area.
- The drill rig mast (derrick) must be lowered prior to moving between drilling locations.
- The drill rig masts should not be raised if the rig will not be at least 20 feet away from overhead utilities.
- The location of underground utilities should be determined prior to erecting the rig.
- The drill rigs must be properly erected, leveled and stabilized prior to drilling.
- The operator must shut down the vehicle engine before leaving the vicinity of the machine.
- All personnel not directly involved in operating the rig or in sampling should remain clear of the drilling equipment when it is in operation.
- All unattended boreholes must be adequately covered or otherwise protected to prevent trip and fall hazards. All open boreholes should be covered, protected or backfilled as specified in local or state regulations.
- When climbing to or working on a derrick platform that is higher than 20 feet, a safety climbing device should be used.
- The user of wire line hoists, wire rope and hoisting hardware should be as stipulated by the American Iron and Steel Institute Wire Rope User's Manual.
- The rig should be operated in a manner which is consistent with the manufacturers' ratings of speed, force, torque, pressure, flow, etc. The rig and tools should be used for the purposes for which they were intended.

APPENDIX D
HEAT/COLD STRESS PROTOCOLS

HEAT STRESS

Heat Stress (Hyperthermia)

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

1. Prior to site activity, the field team leader may make arrangements for heat stress monitoring (i.e., monitoring heart rate, body temperature, and body water loss) during actual site work if conditions warrant. In addition, the FTL is to ensure that each team member has been acclimatized to the prevailing environmental conditions, that personnel are aware of the signs and symptoms of heat sickness, that they have been adequately trained in first aid procedures, and that there are enough personnel on-site to rotate work assignments and schedule work during hours of reduced temperatures. Personnel should not consume alcoholic or caffeinated beverages but rather drink moderate levels of an electrolyte solution and eat well prior to commencing site work.
2. Although there is no specific test given during a baseline physical that would identify a person's intolerance to heat, some indicators are tobacco or medication use, dietary habits, body weight, and chronic conditions such as high blood pressure or diabetes.
3. *Heat cramps*, caused by profuse perspiration with inadequate fluid intake and salt replacement, most often afflict people in good physical condition who work in high temperature and humidity. Heat cramps usually come on suddenly during vigorous activity. Untreated, heat cramps may progress rapidly to heat exhaustion or heat stroke. First aid treatment: remove victim to a cool place and replace lost fluids with water.
4. Thirst is not an adequate indicator of heat exposure. Drinking fluid by itself does not indicate sufficient water replacement during heat exposure. A general rule, the amount of water administered should replace the amount of water lost, and it should be administered at regular intervals throughout the day. For every half pound of water lost, 8 ounces of water should be ingested. Water should be replaced by drinking 2 – 4 ounce servings during every rest period. A recommended alternative to water is an electrolyte drink split 50/50 with water.
5. Heat exhaustion results from salt and water loss along with peripheral pooling of blood. Like heat cramps, heat exhaustion tends to occur in persons in good physical health who are working in high temperatures and humidity. Heat exhaustion may come on suddenly as dizziness and collapse. Untreated, heat exhaustion may progress to heat stroke.

6. Treatment for heat exhaustion: Move the victim to a cool environment (e.g. air-conditioned room/car), lay victim down and fan him/her. If the air-conditioning is not available, remove the victim to a shaded area, remove shirt, and fan. If symptoms do not subside within an hour, notify 911 to transport to hospital.
7. Heat stroke results from the body's inability to dissipate excess heat. A true medical emergency that requires immediate care, it usually occurs when one ignores the signs of heat exhaustion and continues strenuous activities. Working when the relative humidity exceeds 60% is a particular problem. Workers in the early phase of heat stress may not be coherent of they will be confused, delirious or comatose. Changes in behavior, irritability and combativeness are useful early signs of heat stroke.
8. Treatment of heat stroke: Move the victim to a cool, air-conditioned environment. Place victim in a semi-reclined position with head elevated and strip to underclothing. Cool victim as rapidly as possible, applying ice packs to the arms and legs and massaging the neck and torso. Spray victim with tepid water and constantly fan to promote evaporation. Notify 911 to transport to hospital as soon as possible.

SYMPTOMS OF HEAT STRESS

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

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

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

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

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

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

HEAT STRESS INDICATORS

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

COLD STRESS

Cold stress (Hypothermia)

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

Prevention

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

1. Maintain body core temperature at 98.6oF or above by encouraging workers to drink warm liquids during breaks (preferably not coffee) and wear several layers of clothing that can keep the body warm even when the clothing is wet.
2. Avoid frostbite by adequately covering hands, feet and other extremities. Clothing such as insulated gloves or mittens, earmuffs and hat liners should be worn. To prevent contact frostbite (from touching metal and cold surfaces below 20°F), workers should wear gloves. Tool handles should be covered with insulating material.
3. Adjust work schedules to provide adequate rest periods. When feasible, rotate personnel and perform work during the warmer hours of the day.
4. Provide heated shelter. Workers should remove their outer layer(s) of clothing while in the shelter to allow sweat to evaporate.
5. In the event that wind barriers are constructed around an intrusive operation (such as drilling), the enclosure must be properly vented to prevent the buildup of toxic or explosive gases or vapors. Care must be taken to keep a heat source away from flammable substances.
6. Using a wind chill chart such as the one included below, obtain the equivalent chill temperature (ECT) based on actual wind speed and temperature. Refer to the ECT when setting up work warm-up schedules, planning appropriate clothing, etc. Workers should use warming shelters at regular intervals at or below an ECT of 20°F. For exposed skin, continuous exposure should not be permitted at or below an ECT of -25°F.

FROSTBITE

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

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

1. Frostnip is the incipient stage of frostbite, brought about by direct contact with a cold object or exposure of a body part to cool/cold air. Wind chill or cold water also can be major factors. This condition is not serious. Tissue damage is minor and the response to care is good. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostnip.
2. Treatment of frostnip: Care for frostnip by warming affected areas. Usually the worker can apply warmth from his/her bare hands, blow warm air on the site, or, if the fingers are involved, hold them in the armpits. During recovery, the worker may complain of tingling or burning sensation, which is normal. If the condition does not respond to this simple care, begin treatment for frostbite.
3. Frostbite: The skin and subcutaneous layers become involved. If frostnip goes untreated, it becomes superficial frostbite. This condition is serious. Tissue damage may be serious. The worker must be transported to a medical facility for evaluation. The tip of the nose, tips of ears, upper cheeks and fingers (all areas generally exposed) are most susceptible to frostbite. The affected area will feel frozen, but only on the surface. The tissue below the surface must still be soft and have normal response to touch. DO NOT squeeze or poke the tissue. The condition of the deeper tissues can be determined by gently palpating the affected area. The skin will turn mottled or blotchy. It may also be white and then turn grayish-yellow.
4. Treatment of frostbite: When practical, transport victim as soon as possible. Get the worker inside and keep him/her warm. Do not allow any smoking or alcohol consumption. Thaw frozen parts by immersion, re-warming in a 100°F to 106°F water bath. Water temperature will drop rapidly, requiring additional warm water throughout the process. Cover the thawed part with a dry sterile dressing. Do not puncture or drain any blisters. NOTE: Never listen to myths and folk tales about the care of frostbite. Never rub a

frostbitten or frozen area. Never rub snow on a frostbitten or frozen area. Rubbing the area may cause serious damage to already injured tissues. Do not attempt to thaw a frozen area if there is any chance it will be re-frozen.

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

Body Temp (°F)	Body Temp (°C)	Symptoms
99-96	37-35.5	Intense uncontrollable shivering
95-91	35.5-32.7	Violent shivering persists. If victim is conscious, has difficulty speaking.
90-86	32.6-30	Shivering decreases and is replaced by strong muscular rigidity. Muscle coordination is affected. Erratic or jerkey movements are produced. Thinking is less clear. General comprehension is dulled. There may be total amnesia. The worker is generally still able to maintain the appearance of psychological contact with his surroundings.
85-81	29.9-27.2	Victim becomes irrational, loses contact with his environment, and drifts into a stupor. Muscular rigidity continues. Pulse and respirations are slow and the worker may develop cardiac arrhythmias.
80-78	27.1-25.5	Victim becomes unconscious. He does not respond to the spoken word. Most reflexes cease to function. Heartbeat becomes erratic
Below 78	Below 25.5	Cardiac and respiratory centers of the brain fail. Ventricular fibrillation occurs; probably edema and hemorrhage in the lungs; death.

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

PWGC
CLIENT DRIVEN SOLUTIONS

COOLING POWER OF WIND ON EXPOSED FLESH EXPRESSED AS AN EQUIVALENT TEMPERATURE (UNDER CALM CONDITIONS)

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

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

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

APPENDIX E
CHEMICAL HAZARDS

Benzene

Synonyms & Trade Names Benzol, Phenyl hydride

CAS No.	RTECS No.	DOT ID & Guide
71-43-2	CY1400000 (/niosh-rtecs/CY155CCo.html)	1114 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula C_6H_6	**Conversion** 1 ppm = 3.19 mg/m3	**IDLH** Ca [500 ppm] See: 71432 (/niosh/idlh/71432.html)

Exposure Limits

NIOSH REL : Ca TWA 0.1 ppm ST 1 ppm See Appendix A (nengapdxa.html)
OSHA PEL : [1910.1028] TWA 1 ppm ST 5 ppm See Appendix F (nengapdxf.html)

Measurement Methods
NIOSH 1500 (/niosh/docs/2003-154/pdfs/1500.pdf), 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3700 (/niosh/docs/2003-154/pdfs/3700.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf);
OSHA 12 (http://www.osha.gov/dts/sltc/methods/organic/org012/org012.html) (http://www.cdc.gov/Other/disclaimer.html), 1005 (http://www.osha.gov/dts/sltc/methods/validated/1005/1005.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]

MW:	BP:	FRZ:	Sol:	VP:	IP:
78.1	176°F	42°F	0.07%	75 mmHg	9.24 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.88	12°F	7.8%	1.2%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers, many fluorides & perchlorates, nitric acid

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, respiratory system; dizziness; headache, nausea, staggered gait; anorexia, lassitude (weakness, exhaustion); dermatitis; bone marrow depression; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, blood, central nervous system, bone marrow

Cancer Site [leukemia]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
(See Appendix E) (nengapdxe.html)

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0015 (/niosh/ipcsneng/neng0015.html) See MEDICAL TESTS: 0022 (/niosh/docs/2005-110/nmed0022.html)

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Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Ethyl benzene

Synonyms & Trade Names Ethylbenzol, Phenylethane		
CAS No. 100-41-4	**RTECS No.** DA0700000 (/niosh-rtecs/DAAAE60.html)	**DOT ID & Guide** 1175 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $CH_3CH_2C_6H_5$	**Conversion** 1 ppm = 4.34 mg/m3	**IDLH** 800 ppm [10%LEL] See: 100414 (/niosh/idlh/100414.html)
Exposure Limits **NIOSH REL** : TWA 100 ppm (435 mg/m3) ST 125 ppm (545 mg/m3) **OSHA PEL** † (nengapdxg.html) : TWA 100 ppm (435 mg/m3)		**Measurement Methods** **NIOSH** 1501 (/niosh/docs/2003-154/pdfs/1501.pdf) ; **OSHA** 7 (http://www.osha.gov/dts/sltc/methods/organic/org001/org001.html) (http://www.cdc.gov/Other/disclaimer.html) , 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	277°F	-139°F	0.01%	7 mmHg	8.76 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.87	55°F	6.7%	0.8%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; headache; dermatitis; narcosis, coma

Target Organs Eyes, skin, respiratory system, central nervous system

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable) **Change:** No recommendation	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Water flush promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 800 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0268 (/niosh/ipcsneng/neng0268.html)
See MEDICAL TESTS: 0098 (/niosh/docs/2005-110/nmed0098.html)

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Toluene

Synonyms & Trade Names Methyl benzene, Methyl benzol, Phenyl methane, Toluol

CAS No. 108-88-3	**RTECS No.** XS5250000 (/niosh-rtecs/XS501BDo.html)	**DOT ID & Guide** 1294 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_5CH_3$	**Conversion** 1 ppm = 3.77 mg/m3	**IDLH** 500 ppm See: 108883 (/niosh/idlh/108883.html)

Exposure Limits

NIOSH REL : TWA 100 ppm (375 mg/m3) ST 150 ppm (560 mg/m3)
OSHA PEL † (nengapdxg.html) : TWA 200 ppm C 300 ppm 500 ppm (10-minute maximum peak)

Measurement Methods
NIOSH 1500 (/niosh/docs/2003-154/pdfs/1500.pdf) , 1501 (/niosh/docs/2003-154/pdfs/1501.pdf) , 3800 (/niosh/docs/2003-154/pdfs/3800.pdf) , 4000 (/niosh/docs/2003-154/pdfs/4000.pdf) ;
OSHA 111 (http://www.osha.gov/dts/sltc/methods/organic/org111/org111.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with a sweet, pungent, benzene-like odor.

MW:	BP:	FRZ:	Sol(74°F):	VP:	IP:
92.1	232°F	-139°F	0.07%	21 mmHg	8.82 eV

Sp.Gr:	Fl.P:	UEL:	LEL:
0.87	40°F	7.1%	1.1%

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, nose; lassitude (weakness, exhaustion), confusion, euphoria, dizziness, headache; dilated pupils, lacrimation (discharge of tears); anxiety, muscle fatigue, insomnia; paresthesia; dermatitis; liver, kidney damage

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly

Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)
Change: No recommendation

Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

Up to 500 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0078 (/niosh/ipcsneng/neng0078.html) See MEDICAL TESTS: 0232 (/niosh/docs/2005-110/nmed0232.html)

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p-Xylene

Synonyms & Trade Names 1,4-Dimethylbenzene; para-Xylene; p-Xylol

CAS No. 106-42-3	**RTECS No.** ZE2625000 (/niosh-rtecs/ZE280DE8.html)	**DOT ID & Guide** 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_4(CH_3)_2$	**Conversion** 1 ppm = 4.41 mg/m³	**IDLH** 900 ppm See: 95476 (/niosh/idlh/95476.html)
Exposure Limits **NIOSH REL** : TWA 100 ppm (435 mg/m³) ST 150 ppm (655 mg/m³) **OSHA PEL** † (nengapdxg.html) : TWA 100 ppm (435 mg/m³)		**Measurement Methods** **NIOSH** 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); **OSHA** 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor. [Note: A solid below 56°F.]

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	281°F	56°F	0.02%	9 mmHg	8.44 eV

Sp.Gr:	Fl.P:	UEL:	LEL:
0.86	81°F	7.0%	1.1%

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable)	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Soap wash promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0086 (/niosh/ipcsneng/neng0086.html)

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o-Xylene

Synonyms & Trade Names 1,2-Dimethylbenzene; ortho-Xylene; o-Xylol

CAS No. 95-47-6	**RTECS No.** ZE2450000 (/niosh-rtecs/ZE256250.html)	**DOT ID & Guide** 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_4(CH_3)_2$	**Conversion** 1 ppm = 4.34 mg/m³	**IDLH** 900 ppm See: 95476 (/niosh/idlh/95476.html)

Exposure Limits
NIOSH REL : TWA 100 ppm (435 mg/m³)
ST 150 ppm (655 mg/m³)
OSHA PEL † (nengapdxg.html) : TWA 100 ppm (435 mg/m³)

Measurement Methods
NIOSH 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf);
OSHA 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	292°F	-13°F	0.02%	7 mmHg	8.56 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.88	90°F	6.7%	0.9%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet (flammable)

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Remove: When wet (flammable)
Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0084 (/niosh/ipcsneng/neng0084.html)

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m-Xylene

Synonyms & Trade Names 1,3-Dimethylbenzene; meta-Xylene; m-Xylol

CAS No. 108-38-3	**RTECS No.** ZE2275000 (/niosh-rtecs/ZE22B6B8.html)	**DOT ID & Guide** 1307 130 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_4(CH_3)_2$	**Conversion** 1 ppm = 4.34 mg/m³	**IDLH** 900 ppm See: 95476 (/niosh/idlh/95476.html)
Exposure Limits **NIOSH REL** : TWA 100 ppm (435 mg/m³) ST 150 ppm (655 mg/m³) **OSHA PEL** † (nengapdxg.html) : TWA 100 ppm (435 mg/m³)		**Measurement Methods** **NIOSH** 1501 (/niosh/docs/2003-154/pdfs/1501.pdf), 3800 (/niosh/docs/2003-154/pdfs/3800.pdf); **OSHA** 1002 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1002/1002.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with an aromatic odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
106.2	282°F	-54°F	Slight	9 mmHg	8.56 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
0.86	82°F	7.0%	1.1%		

Class IC Flammable Liquid: Fl.P. at or above 73°F and below 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat; dizziness, excitement, drowsiness, incoordination, staggering gait; corneal vacuolization; anorexia, nausea, vomiting, abdominal pain; dermatitis

Target Organs Eyes, skin, respiratory system, central nervous system, gastrointestinal tract, blood, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable)	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Soap wash promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Change: No recommendation

Respirator Recommendations

NIOSH/OSHA

Up to 900 ppm:
(APF = 10) Any chemical cartridge respirator with organic vapor cartridge(s)*
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)*
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0085 (/niosh/ipcsneng/neng0085.html)

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Tetrachloroethylene

Synonyms & Trade Names Perchlorethylene, Perchloroethylene, Perk, Tetrachlorethylene

CAS No. 127-18-4	**RTECS No.** KX3850000 (/niosh-rtecs/KX3ABF10.html)	**DOT ID & Guide** 1897 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=160) (http://www.cdc.gov/Other/disclaimer.html)
Formula $Cl_2C=CCl_2$	**Conversion** 1 ppm = 6.78 mg/m3	**IDLH** Ca [150 ppm] See: 127184 (/niosh/idlh/127184.html)
Exposure Limits **NIOSH REL** : Ca Minimize workplace exposure concentrations. See Appendix A (nengapdxa.html) **OSHA PEL** † (nengapdxg.html): TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm		**Measurement Methods** **NIOSH** 1003 (/niosh/docs/2003-154/pdfs/1003.pdf); **OSHA** 1001 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1001/1001.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with a mild, chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
165.8	250°F	-2°F	0.02%	14 mmHg	9.32 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
1.62	NA	NA	NA		

Noncombustible Liquid, but decomposes in a fire to hydrogen chloride and phosgene.

Incompatibilities & Reactivities Strong oxidizers; chemically-active metals such as lithium, beryllium & barium; caustic soda; sodium hydroxide; potash

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness); liver damage; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, liver, kidneys, central nervous system

Cancer Site [in animals: liver tumors]

Personal Protection/Sanitation (See protection codes (protect.html))	First Aid (See procedures (firstaid.html))
Skin: Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet or contaminated **Change:** No recommendation **Provide:** Eyewash, Quick drench	**Eye:** Irrigate immediately **Skin:** Soap wash promptly **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0076 (/niosh/ipcsneng/neng0076.html) See MEDICAL TESTS: 0179 (/niosh/docs/2005-110/nmed0179.html)

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Trichloroethylene

Synonyms & Trade Names Ethylene trichloride, TCE, Trichloroethene, Trilene

CAS No. 79-01-6	**RTECS No.** KX4550000 (/niosh-rtecs/KX456D70.html)	**DOT ID & Guide** 1710 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=160) (http://www.cdc.gov/Other/disclaimer.html)
Formula $ClCH=CCl_2$	**Conversion** 1 ppm = 5.37 mg/m3	**IDLH** Ca [1000 ppm] See: 79016 (/niosh/idlh/79016.html)
Exposure Limits **NIOSH REL** : Ca See Appendix A (nengapdxa.html) See Appendix C (nengapdxc.html) **OSHA PEL** † (nengapdxg.html) : TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)		**Measurement Methods** **NIOSH** 1022 (/niosh/docs/2003-154/pdfs/1022.pdf) , 3800 (/niosh/docs/2003-154/pdfs/3800.pdf) ; **OSHA** 1001 (http://www.osha.gov/dts/sltc/methods/mdt/mdt1001/1001.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid (unless dyed blue) with a chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
131.4	189°F	-99°F	0.1%	58 mmHg	9.45 eV
Sp.Gr: 1.46	**Fl.P:** ?	UEL(77°F): 10.5%	LEL(77°F): 8%		

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities Strong caustics & alkalis; chemically-active metals (such as barium, lithium, sodium, magnesium, titanium & beryllium)

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia; liver injury; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system

Cancer Site [in animals: liver & kidney cancer]

Personal Protection/Sanitation (See protection codes (protect.html))	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately

codes (protectionin.)

Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation
Provide: Eyewash, Quick drench

Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0081 (/niosh/ipcsneng/neng0081.html)
See MEDICAL TESTS: 0236 (/niosh/docs/2005-110/nmed0236.html)

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Vinylidene chloride

Synonyms & Trade Names 1,1-DCE; 1,1-Dichloroethene; 1,1-Dichloroethylene; VDC; Vinylidene chloride monomer; Vinylidene dichloride

CAS No. 75-35-4	**RTECS No.** KV9275000 (/niosh-rtecs/KV8D8678.html)	**DOT ID & Guide** 1303 130P (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130&poly=1) (http://www.cdc.gov/Other/disclaimer.html) (inhibited)
Formula $CH_2=CCl_2$	**Conversion**	**IDLH** Ca [N.D.] See: IDLH INDEX (/niosh/idlh/intridl4.html)
Exposure Limits **NIOSH REL** : Ca See Appendix A (nengapdxa.html) **OSHA PEL** † (nengapdxg.html) : none		**Measurement Methods** **NIOSH** 1015 (/niosh/docs/2003-154/pdfs/1015.pdf) ; **OSHA** 19 (http://www.osha.gov/dts/sltc/methods/organic/org019/org019.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid or gas (above 89°F) with a mild, sweet, chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
96.9	89°F	-189°F	0.04%	500 mmHg	10.00 eV
Sp.Gr:	**Fl.P:**	**UEL:**	**LEL:**		
1.21	-2°F	15.5%	6.5%		

Class IA Flammable Liquid: Fl.P. below 73°F and BP below 100°F.

Incompatibilities & Reactivities Aluminum, sunlight, air, copper, heat [Note: Polymerization may occur if exposed to oxidizers, chlorosulfonic acid, nitric acid, or oleum. Inhibitors such as the monomethyl ether of hydroquinone are added to prevent polymerization.]

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, throat; dizziness, headache, nausea, dyspnea (breathing difficulty); liver, kidney disturbance; pneumonitis; [potential occupational carcinogen]

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys

Cancer Site [in animals: liver & kidney tumors]

Personal Protection/Sanitation (See protection codes (protect.html))	First Aid (See procedures (firstaid.html))
Skin: Prevent skin contact **Eyes:** Prevent eye contact **Wash skin:** When contaminated **Remove:** When wet (flammable) **Change:** No recommendation **Provide:** Eyewash, Quick drench	**Eye:** Irrigate immediately **Skin:** Soap flush immediately **Breathing:** Respiratory support **Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0083 (/niosh/ipcsneng/neng0083.html)

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1,2-Dichloroethylene

Synonyms & Trade Names Acetylene dichloride, cis-Acetylene dichloride, trans-Acetylene dichloride, sym-Dichloroethylene

CAS No. 540-59-0	**RTECS No.** KV9360000 (/niosh-rtecs/KV8ED280.html)	**DOT ID & Guide** 1150 130P (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=130&poly=1) (http://www.cdc.gov/Other/disclaimer.html)
Formula ClCH=CHCl	**Conversion** 1 ppm = 3.97 mg/m3	**IDLH** 1000 ppm See: 540590 (/niosh/idlh/540590.html)
Exposure Limits **NIOSH REL** : TWA 200 ppm (790 mg/m3) **OSHA PEL** : TWA 200 ppm (790 mg/m3)		**Measurement Methods** **NIOSH** 1003 (/niosh/docs/2003-154/pdfs/1003.pdf); **OSHA** 7 (http://www.osha.gov/dts/sltc/methods/organic/org001/org001.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid (usually a mixture of the cis & trans isomers) with a slightly acrid, chloroform-like odor.

MW: 97.0	**BP:** 118-140°F	**FRZ:** -57 to -115°F	**Sol:** 0.4%	**VP:** 180-265 mmHg	**IP:** 9.65 eV
Sp.Gr(77°F): 1.27	**Fl.P:** 36-39°F	**UEL:** 12.8%	**LEL:** 5.6%		

Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.

Incompatibilities & Reactivities Strong oxidizers, strong alkalis, potassium hydroxide, copper [Note: Usually contains inhibitors to prevent polymerization.]

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, respiratory system; central nervous system depression

Target Organs Eyes, respiratory system, central nervous system

Personal Protection/Sanitation (See protection codes (protect.html)) **Skin:** Prevent skin contact **Eyes:** Prevent eye contact	**First Aid** (See procedures (firstaid.html)) **Eye:** Irrigate immediately **Skin:** Soap wash promptly **Breathing:** Respiratory support

Wash skin: When contaminated **Remove:** When wet (flammable) **Change:** No recommendation	**Swallow:** Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 1000 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode£
(APF = 25) Any powered, air-purifying respirator with organic vapor cartridge(s)£
(APF = 50) Any chemical cartridge respirator with a full facepiece and organic vapor cartridge(s)
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0436 (/niosh/ipcsneng/neng0436.html)

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Vinyl chloride

Synonyms & Trade Names Chloroethene, Chloroethylene, Ethylene monochloride, Monochloroethene, Monochloroethylene, VC, Vinyl chloride monomer (VCM)

CAS No. 75-01-4	**RTECS No.** KU9625000 (/niosh-rtecs/KU92DDA8.html)	**DOT ID & Guide** 1086 116P (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=116&poly=1) (http://www.cdc.gov/Other/disclaimer.html) (inhibited)
Formula CH_2=CHCl	**Conversion** 1 ppm = 2.56 mg/m3	**IDLH** Ca [N.D.] See: IDLH INDEX (/niosh/idlh/intridl4.html)
Exposure Limits **NIOSH REL** : Ca See Appendix A (nengapdxa.html) **OSHA PEL** : [1910.1017] TWA 1 ppm C 5 ppm [15-minute]		**Measurement Methods** **NIOSH** 1007 (/niosh/docs/2003-154/pdfs/1007.pdf) ; **OSHA** 4 (http://www.osha.gov/dts/sltc/methods/organic/org004/org004.html) (http://www.cdc.gov/Other/disclaimer.html) , 75 (http://www.osha.gov/dts/sltc/methods/organic/org075/org075.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. [Note: Shipped as a liquefied compressed gas.]

MW: 62.5	**BP:** 7°F	**FRZ:** -256°F	Sol(77°F): 0.1%	**VP:** 3.3 atm	**IP:** 9.99 eV
	Fl.P: NA (Gas)	**UEL:** 33.0%	**LEL:** 3.6%	**RGasD:** 2.21	

Flammable Gas

Incompatibilities & Reactivities Copper, oxidizers, aluminum, peroxides, iron, steel [Note: Polymerizes in air, sunlight, or heat unless stabilized by inhibitors such as phenol. Attacks iron & steel in presence of moisture.]

Exposure Routes inhalation, skin and/or eye contact (liquid)

Symptoms lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]

Target Organs Liver, central nervous system, blood, respiratory system, lymphatic system

Cancer Site [liver cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Frostbite
Eyes: Frostbite
Wash skin: No recommendation
Remove: When wet (flammable)
Change: No recommendation
Provide: Frostbite wash

First Aid (See procedures (firstaid.html))
Eye: Frostbite
Skin: Frostbite
Breathing: Respiratory support

Respirator Recommendations
(See Appendix E) (nengapdxe.html)

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0082 (/niosh/ipcsneng/neng0082.html)
See MEDICAL TESTS: 0241 (/niosh/docs/2005-110/nmed0241.html)

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Methyl chloroform

Synonyms & Trade Names Chlorothene; 1,1,1-Trichloroethane; 1,1,1-Trichloroethane (stabilized)

CAS No. 71-55-6	**RTECS No.** KJ2975000 (/niosh-rtecs/KJ2D6518.html)	**DOT ID & Guide** 2831 160 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=160) (http://www.cdc.gov/Other/disclaimer.html)
Formula CH_3CCl_3	**Conversion** 1 ppm = 5.46 mg/m3	**IDLH** 700 ppm See: 71556 (/niosh/idlh/71556.html)
Exposure Limits **NIOSH REL** : C 350 ppm (1900 mg/m3) [15-minute] See Appendix C (nengapdxc.html) (Chloroethanes) **OSHA PEL** † (nengapdxg.html): TWA 350 ppm (1900 mg/m3)		**Measurement Methods** **NIOSH** 1003 (/niosh/docs/2003-154/pdfs/1003.pdf) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless liquid with a mild, chloroform-like odor.

MW:	BP:	FRZ:	Sol:	VP:	IP:
133.4	165°F	-23°F	0.4%	100 mmHg	11.00 eV
Sp.Gr: 1.34	**Fl.P:** ?	**UEL:** 12.5%	**LEL:** 7.5%		

Combustible Liquid, but burns with difficulty.

Incompatibilities & Reactivities Strong caustics; strong oxidizers; chemically-active metals such as zinc, aluminum, magnesium powders, sodium & potassium; water [Note: Reacts slowly with water to form hydrochloric acid.]

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depression, poor equilibrium; dermatitis; cardiac arrhythmias; liver damage

Target Organs Eyes, skin, central nervous system, cardiovascular system, liver

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: No recommendation

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 700 ppm:
(APF = 10) Any supplied-air respirator*
(APF = 50) Any self-contained breathing apparatus with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0079 (/niosh/ipcsneng/neng0079.html) See MEDICAL TESTS: 0141 (/niosh/docs/2005-110/nmed0141.html)

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Coal tar pitch volatiles

Synonyms & Trade Names Synonyms vary depending upon the specific compound (e.g., pyrene, phenanthrene, acridine, chrysene, anthracene & benzo(a)pyrene). [Note: NIOSH considers coal tar, coal tar pitch, and creosote to be coal tar products.]

CAS No.	RTECS No.	DOT ID & Guide
65996-93-2	GF8655000 (/niosh-rtecs/GF841098.html)	2713 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html) (acridine)
	Conversion	**IDLH** Ca [80 mg/m3] See: 65996932 (/niosh/idlh/65996932.html)

Exposure Limits

NIOSH REL : Ca TWA 0.1 mg/m3 (cyclohexane-extractable fraction)
See Appendix A (nengapdxa.html)
See Appendix C (nengapdxc.html)
OSHA PEL : TWA 0.2 mg/m3 (benzene-soluble fraction) [1910.1002] See Appendix C (nengapdxc.html)

Measurement Methods
OSHA 58 (http://www.osha.gov/dts/sltc/methods/organic/org058/org058.html) (http://www.cdc.gov/Other/disclaimer.html)
See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Black or dark-brown amorphous residue.

Properties vary depending upon the specific compound.					

Combustible Solids

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin and/or eye contact

Symptoms dermatitis, bronchitis, [potential occupational carcinogen]

Target Organs respiratory system, skin, bladder, kidneys

Cancer Site [lung, kidney & skin cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: Daily
Remove: No recommendation
Change: Daily

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 1415 (/niosh/ipcsneng/neng1415.html) See MEDICAL TESTS: 0054 (/niosh/docs/2005-110/nmed0054.html)

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Phenol

Synonyms & Trade Names Carbolic acid, Hydroxybenzene, Monohydroxybenzene, Phenyl alcohol, Phenyl hydroxide

CAS No. 108-95-2	**RTECS No.** SJ3325000 (/niosh-rtecs/SJ32BC48.html)	**DOT ID & Guide** 1671 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html) (solid) 2312 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html) (molten) 2821 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html) (solution)
Formula C_6H_5OH	**Conversion** 1 ppm = 3.85 mg/m3	**IDLH** 250 ppm See: 108952 (/niosh/idlh/108952.html)
Exposure Limits **NIOSH REL** : TWA 5 ppm (19 mg/m3) C 15.6 ppm (60 mg/m3) [15-minute] [skin] **OSHA PEL** : TWA 5 ppm (19 mg/m3) [skin]		**Measurement Methods** **NIOSH** 2546 (/niosh/docs/2003-154/pdfs/2546.pdf) ; **OSHA** 32 See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to light-pink, crystalline solid with a sweet, acrid odor. [Note: Phenol liquefies by mixing with about 8% water.]

MW: 94.1	**BP:** 359°F	MLT: 109°F	Sol(77°F): 9%	**VP:** 0.4 mmHg	**IP:** 8.50 eV
Sp.Gr: 1.06	**Fl.P:** 175°F	**UEL:** 8.6%	**LEL:** 1.8%		

Combustible Solid

Incompatibilities & Reactivities Strong oxidizers, calcium hypochlorite, aluminum chloride, acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, nose, throat; anorexia, weight loss; lassitude (weakness, exhaustion), muscle ache, pain; dark urine; cyanosis; liver, kidney damage; skin burns; dermatitis; ochronosis; tremor, convulsions, twitching

Target Organs Eyes, skin, respiratory system, liver, kidneys

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
NIOSH/OSHA

Up to 50 ppm:
(APF = 10) Any air-purifying half-mask respirator with organic vapor cartridge(s) in combination with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 125 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with an organic vapor cartridge in combination with a high-efficiency particulate filter.

Up to 250 ppm:
(APF = 50) Any air-purifying full-facepiece respirator equipped with organic vapor cartridge(s) in combination with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0070 (/niosh/ipcsneng/neng0070.html) See MEDICAL TESTS: 0182 (/niosh/docs/2005-110/nmed0182.html)

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Naphthalene

Synonyms & Trade Names Naphthalin, Tar camphor, White tar

CAS No. 91-20-3	**RTECS No.** QJ0525000 (/niosh-rtecs/QJ802C8.html)	**DOT ID & Guide** 1334 133 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=133) (http://www.cdc.gov/Other/disclaimer.html) (crude or refined) 2304 133 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=133) (http://www.cdc.gov/Other/disclaimer.html) (molten)
Formula $C_{10}H_8$	**Conversion** 1 ppm = 5.24 mg/m³	**IDLH** 250 ppm See: 91203 (/niosh/idlh/91203.html)
Exposure Limits **NIOSH REL** : TWA 10 ppm (50 mg/m³) ST 15 ppm (75 mg/m³) **OSHA PEL** † (nengapdxg.html) : TWA 10 ppm (50 mg/m³)		**Measurement Methods** **NIOSH** 1501 (/niosh/docs/2003-154/pdfs/1501.pdf) ; **OSHA** 35 (http://www.osha.gov/dts/sltc/methods/organic/org035/org035.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to brown solid with an odor of mothballs. [Note: Shipped as a molten solid.]

MW:	BP:	MLT:	Sol:	VP:	IP:
128.2	424°F	176°F	0.003%	0.08 mmHg	8.12 eV

Sp.Gr:	Fl.P:	UEL:	LEL:
1.15	174°F	5.9%	0.9%

Combustible Solid, but will take some effort to ignite.

Incompatibilities & Reactivities Strong oxidizers, chromic anhydride

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes; headache, confusion, excitement, malaise (vague feeling of discomfort); nausea, vomiting, abdominal pain; irritation bladder; profuse sweating; jaundice; hematuria (blood in the urine), renal shutdown; dermatitis, optical neuritis, corneal damage

Target Organs Eyes, skin, blood, liver, kidneys, central nervous system

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Molten flush immediately/solid-liquid soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH/OSHA

Up to 100 ppm:
(APF = 10) Any air-purifying half-mask respirator with organic vapor cartridge(s) in combination with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.*
(APF = 10) Any supplied-air respirator*

Up to 250 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode*
(APF = 50) Any air-purifying full-facepiece respirator equipped with organic vapor cartridge(s) in combination with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 25) Any powered, air-purifying respirator with an organic vapor cartridge in combination with a high-efficiency particulate filter.*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0667 (/niosh/ipcsneng/neng0667.html) See MEDICAL TESTS: 0152 (/niosh/docs/2005-110/nmed0152.html)

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p-Cresol

Synonyms & Trade Names para-Cresol, 4-Cresol, p-Cresylic acid, 1-Hydroxy-4-methylbenzene, 4-Hydroxytoluene, 4-Methyl phenol

CAS No. 106-44-5	**RTECS No.** GO6475000 (/niosh-rtecs/GO62CCF8.html)	**DOT ID & Guide** 2076 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html)
Formula $CH_3C_6H_4OH$	**Conversion** 1 ppm = 4.43 mg/m³	**IDLH** 250 ppm See: cresol (/niosh/idlh/cresol.html)
Exposure Limits **NIOSH REL** : TWA 2.3 ppm (10 mg/m³) **OSHA PEL** : TWA 5 ppm (22 mg/m³) [skin]		**Measurement Methods** **NIOSH** 2546 (/niosh/docs/2003-154/pdfs/2546.pdf) ; **OSHA** 32 See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Crystalline solid with a sweet, tarry odor. [Note: A liquid above 95°F.]

MW: 108.2	**BP:** 396°F	MLT: 95°F	**Sol:** 2%	VP(77°F): 0.11 mmHg	**IP:** 8.97 eV
Sp.Gr: 1.04	**Fl.P:** 187°F	**UEL:** ?	LEL(300°F): 1.1%		

Combustible Solid Class IIIA Combustible Liquid: Fl.P. at or above 140°F and below 200°F.

Incompatibilities & Reactivities Strong oxidizers, acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys, pancreas, cardiovascular system

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

Up to 23 ppm:
(APF = 10) Any air-purifying half-mask respirator with organic vapor cartridge(s) in combination with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 57.5 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with an organic vapor cartridge in combination with a high-efficiency particulate filter.

Up to 115 ppm:
(APF = 50) Any air-purifying full-facepiece respirator equipped with organic vapor cartridge(s) in combination with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter*
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 250 ppm:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is

operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0031 (/niosh/ipcsneng/neng0031.html) See MEDICAL TESTS: 0059 (/niosh/docs/2005-110/nmed0059.html)

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o-Cresol

Synonyms & Trade Names ortho-Cresol, 2-Cresol, o-Cresylic acid, 1-Hydroxy-2-methylbenzene, 2-Hydroxytoluene, 2-Methyl phenol

CAS No. 95-48-7	**RTECS No.** GO6300000 (/niosh-rtecs/GO602160.html)	**DOT ID & Guide** 2076 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html)
Formula $CH_3C_6H_4OH$	**Conversion** 1 ppm = 4.43 mg/m³	**IDLH** 250 ppm See: cresol (/niosh/idlh/cresol.html)
Exposure Limits **NIOSH REL** : TWA 2.3 ppm (10 mg/m³) **OSHA PEL** : TWA 5 ppm (22 mg/m³) [skin]		**Measurement Methods** **NIOSH** 2546 (/niosh/docs/2003-154/pdfs/2546.pdf) ; **OSHA** 32 See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description White crystals with a sweet, tarry odor. [Note: A liquid above 88°F.]

MW: 108.2	**BP:** 376°F	MLT: 88°F	**Sol:** 2%	VP(77°F): 0.29 mmHg	**IP:** 8.93 eV
Sp.Gr: 1.05	**Fl.P:** 178°F	**UEL:** ?	LEL(300°F): 1.4%		

Combustible Solid Class IIIA Combustible Liquid: Fl.P. at or above 140°F and below 200°F.

Incompatibilities & Reactivities Strong oxidizers, acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys, pancreas, cardiovascular system

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

Up to 23 ppm:
(APF = 10) Any air-purifying half-mask respirator with organic vapor cartridge(s) in combination with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 57.5 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with an organic vapor cartridge in combination with a high-efficiency particulate filter.

Up to 115 ppm:
(APF = 50) Any air-purifying full-facepiece respirator equipped with organic vapor cartridge(s) in combination with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter*
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 250 ppm:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is

operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0030 (/niosh/ipcsneng/neng0030.html)

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m-Cresol

Synonyms & Trade Names meta-Cresol, 3-Cresol, m-Cresylic acid, 1-Hydroxy-3-methylbenzene, 3-Hydroxytoluene, 3-Methyl phenol

CAS No. 108-39-4	**RTECS No.** GO6125000 (/niosh-rtecs/GO5D75C8.html)	**DOT ID & Guide** 2076 153 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=153) (http://www.cdc.gov/Other/disclaimer.html)
Formula $CH_3C_6H_4OH$	**Conversion** 1 ppm = 4.43 mg/m³	**IDLH** 250 ppm See: cresol (/niosh/idlh/cresol.html)
Exposure Limits **NIOSH REL** : TWA 2.3 ppm (10 mg/m³) **OSHA PEL** : TWA 5 ppm (22 mg/m³) [skin]		**Measurement Methods** **NIOSH** 2546 (/niosh/docs/2003-154/pdfs/2546.pdf); **OSHA** 32 See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to yellowish liquid with a sweet, tarry odor. [Note: A solid below 54°F.]

MW: 108.2	**BP:** 397°F	**FRZ:** 54°F	**Sol:** 2%	VP(77°F): 0.14 mmHg	**IP:** 8.98 eV
Sp.Gr: 1.03	**Fl.P:** 187°F	**UEL:** ?	LEL(300°F): 1.1%		

Class IIIA Combustible Liquid: Fl.P. at or above 140°F and below 200°F.

Incompatibilities & Reactivities Strong oxidizers, acids

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin, mucous membrane; central nervous system effects: confusion, depression, resp failure; dyspnea (breathing difficulty), irreg rapid resp, weak pulse; eye, skin burns; dermatitis; lung, liver, kidney, pancreas damage

Target Organs Eyes, skin, respiratory system, central nervous system, liver, kidneys, pancreas, cardiovascular system

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

Up to 23 ppm:
(APF = 10) Any air-purifying half-mask respirator with organic vapor cartridge(s) in combination with an N95, R95, or P95 filter. The following filters may also be used: N99, R99, P99, N100, R100, P100.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 57.5 ppm:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with an organic vapor cartridge in combination with a high-efficiency particulate filter.

Up to 115 ppm:
(APF = 50) Any air-purifying full-facepiece respirator equipped with organic vapor cartridge(s) in combination with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and organic vapor cartridge(s) in combination with a high-efficiency particulate filter*
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode*
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 250 ppm:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0646 (/niosh/ipcsneng/neng0646.html)

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Arsenic (inorganic compounds, as As)

Synonyms & Trade Names Arsenic metal: Arsenia
Other synonyms vary depending upon the specific As compound. [Note: OSHA considers "Inorganic Arsenic" to mean copper acetoarsenite and all inorganic compounds containing arsenic except ARSINE.]

CAS No. 7440-38-2 (metal)	**RTECS No.** CG0525000 (metal) (/niosh-rtecs/CG802C8.html)	**DOT ID & Guide** 1558 152 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=152) (http://www.cdc.gov/Other/disclaimer.html) (metal) 1562 152 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=152) (http://www.cdc.gov/Other/disclaimer.html) (dust)
Formula As (metal)	**Conversion**	**IDLH** Ca [5 mg/m³ (as As)] See: 7440382 (/niosh/idlh/7440382.html)
Exposure Limits **NIOSH REL** : Ca C 0.002 mg/m³ [15-minute] See Appendix A (nengapdxa.html) **OSHA PEL** : [1910.1018] TWA 0.010 mg/m³		**Measurement Methods** **NIOSH** 7300 (/niosh/docs/2003-154/pdfs/7300.pdf), 7301 (/niosh/docs/2003-154/pdfs/7301.pdf), 7303 (/niosh/docs/2003-154/pdfs/7303.pdf), 7900 (/niosh/docs/2003-154/pdfs/7900.pdf), 9102 (/niosh/docs/2003-154/pdfs/9102.pdf); **OSHA** ID105 (http://www.osha.gov/dts/sltc/methods/inorganic/id105/id105.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Metal: Silver-gray or tin-white, brittle, odorless solid.

MW: 74.9	**BP:** Sublimes	MLT: 1135°F (Sublimes)	**Sol:** Insoluble	**VP:** 0 mmHg (approx)	**IP:** NA
Sp.Gr: 5.73 (metal)	**Fl.P:** NA	**UEL:** NA	**LEL:** NA		

Metal: Noncombustible Solid in bulk form, but a slight explosion hazard in the form of dust when exposed to flame.

Incompatibilities & Reactivities Strong oxidizers, bromine azide [Note: Hydrogen gas can react with inorganic arsenic to form the highly toxic gas arsine.]

arsine to form the highly toxic gas arsine.]

Exposure Routes inhalation, skin absorption, skin and/or eye contact, ingestion

Symptoms Ulceration of nasal septum, dermatitis, gastrointestinal disturbances, peripheral neuropathy, resp irritation, hyperpigmentation of skin, [potential occupational carcinogen]

Target Organs Liver, kidneys, skin, lungs, lymphatic system

Cancer Site [lung & lymphatic cancer]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated/Daily
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
(See Appendix E) (nengapdxe.html)

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted acid gas canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0013 (/niosh/ipcsneng/neng0013.html)
See MEDICAL TESTS: 0017 (/niosh/docs/2005-110/nmed0017.html)

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Lead

Synonyms & Trade Names Lead metal, Plumbum		
CAS No. 7439-92-1	**RTECS No.** OF7525000 (/niosh-rtecs/OF72D288.html)	**DOT ID & Guide**
Formula Pb	**Conversion**	**IDLH** 100 mg/m3 (as Pb) See: 7439921 (/niosh/idlh/7439921.html)

Exposure Limits

NIOSH REL *: TWA (8-hour) 0.050 mg/m3 See Appendix C (nengapdxc.html) [*Note: The REL also applies to other lead compounds (as Pb) -- see Appendix C.]

OSHA PEL *: [1910.1025] TWA 0.050 mg/m3 See Appendix C (nengapdxc.html) [*Note: The PEL also applies to other lead compounds (as Pb) -- see Appendix C.]

Measurement Methods

NIOSH 7082 (/niosh/docs/2003-154/pdfs/7082.pdf), 7105 (/niosh/docs/2003-154/pdfs/7105.pdf), 7300 (/niosh/docs/2003-154/pdfs/7300.pdf), 7301 (/niosh/docs/2003-154/pdfs/7301.pdf), 7303 (/niosh/docs/2003-154/pdfs/7303.pdf), 7700 (/niosh/docs/2003-154/pdfs/7700.pdf), 7701 (/niosh/docs/2003-154/pdfs/7701.pdf), 7702 (/niosh/docs/2003-154/pdfs/7702.pdf), 9100 (/niosh/docs/2003-154/pdfs/9100.pdf), 9102 (/niosh/docs/2003-154/pdfs/9102.pdf), 9105 (/niosh/docs/2003-154/pdfs/9105.pdf);

OSHA ID121 (http://www.osha.gov/dts/sltc/methods/inorganic/id121/id121.html) (http://www.cdc.gov/Other/disclaimer.html), ID125G (http://www.osha.gov/dts/sltc/methods/inorganic/id125g/id125g.html) (http://www.cdc.gov/Other/disclaimer.html), ID206 (http://www.osha.gov/dts/sltc/methods/inorganic/id206/id206.html) (http://www.cdc.gov/Other/disclaimer.html)

See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description A heavy, ductile, soft, gray solid.

MW:	BP:	MLT:	Sol:	VP:	IP:
207.2	3164°F	621°F	Insoluble	0 mmHg (approx)	NA

Sp.Gr:	Fl.P:	UEL:	LEL:		
11.34	NA	NA	NA		

Noncombustible Solid in bulk form.

Incompatibilities & Reactivities Strong oxidizers, hydrogen peroxide, acids

Exposure Routes inhalation, ingestion, skin and/or eye contact

Symptoms lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension

Target Organs Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: Daily
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap flush promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations
(See Appendix E) (nengapdxe.html)
NIOSH/OSHA

Up to 0.5 mg/m3:
(APF = 10) Any air-purifying respirator with an N100, R100, or P100 filter (including N100, R100, and P100 filtering facepieces) except quarter-mask respirators.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with a high-efficiency particulate filter.

Up to 2.5 mg/m3:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 50 mg/m3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Up to 100 mg/m3:
(APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator with an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0052 (/niosh/ipcsneng/neng0052.html) See MEDICAL TESTS: 0127 (/niosh/docs/2005-110/nmed0127.html)

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Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Mercury compounds [except (organo) alkyls] (as Hg)

Synonyms & Trade Names Mercury metal: Colloidal mercury, Metallic mercury, Quicksilver
Synonyms of "other" Hg compounds vary depending upon the specific compound.

CAS No. 7439-97-6 (metal)	**RTECS No.** OV4550000 (metal) (/niosh-rtecs/OV456D70.html)	**DOT ID & Guide** 2809 172 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=172) (http://www.cdc.gov/Other/disclaimer.html) (metal)
Formula Hg (metal)	**Conversion**	**IDLH** 10 mg/m3 (as Hg) See: 7439976 (/niosh/idlh/7439976.html)
Exposure Limits **NIOSH REL** : Hg Vapor: TWA 0.05 mg/m3 [skin] Other: C 0.1 mg/m3 [skin] **OSHA PEL** † (nengapdxg.html) : TWA 0.1 mg/m3		**Measurement Methods** **NIOSH** 6009 (/niosh/docs/2003-154/pdfs/6009.pdf) ; **OSHA** ID140 (http://www.osha.gov/dts/sltc/methods/inorganic/id140/id140.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Metal: Silver-white, heavy, odorless liquid. [Note: "Other" Hg compounds include all inorganic & aryl Hg compounds except (organo) alkyls.]

MW: 200.6	**BP:** 674°F	**FRZ:** -38°F	**Sol:** Insoluble	**VP:** 0.0012 mmHg	**IP:** ?
Sp.Gr: 13.6 (metal)	**Fl.P:** NA	**UEL:** NA	**LEL:** NA		

Metal: Noncombustible Liquid

Incompatibilities & Reactivities Acetylene, ammonia, chlorine dioxide, azides, calcium (amalgam formation), sodium carbide, lithium, rubidium, copper

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, skin; cough, chest pain, dyspnea (breathing difficulty), bronchitis, pneumonitis;

tremor, insomnia, irritability, indecision, headache, lassitude (weakness, exhaustion); stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria

Target Organs Eyes, skin, respiratory system, central nervous system, kidneys

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: No recommendation
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash promptly
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

Mercury vapor:

NIOSH

Up to 0.5 mg/m3:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern†
(APF = 10) Any supplied-air respirator

Up to 1.25 mg/m3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern†(canister)

Up to 2.5 mg/m3:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern†
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern†
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against the compound of concern(canister)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
Any appropriate escape-type, self-contained breathing apparatus

Other mercury compounds: NIOSH/OSHA

Up to 1 mg/m3:
(APF = 10) Any chemical cartridge respirator with cartridge(s) providing protection against the compound of concern†

(APF = 10) Any supplied-air respirator

Up to 2.5 mg/m3:
(APF = 25) Any supplied-air respirator operated in a continuous-flow mode
(APF = 25) Any powered, air-purifying respirator with cartridge(s) providing protection against the compound of concern†(canister)

Up to 5 mg/m3:
(APF = 50) Any chemical cartridge respirator with a full facepiece and cartridge(s) providing protection against the compound of concern†
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern†
(APF = 50) Any supplied-air respirator that has a tight-fitting facepiece and is operated in a continuous-flow mode
(APF = 50) Any powered, air-purifying respirator with a tight-fitting facepiece and cartridge(s) providing protection against the compound of concern(canister)
(APF = 50) Any self-contained breathing apparatus with a full facepiece
(APF = 50) Any supplied-air respirator with a full facepiece

Up to 10 mg/m3:
(APF = 1000) Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted canister providing protection against the compound of concern
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0056 (/niosh/ipcsneng/neng0056.html) See MEDICAL TESTS: 0136 (/niosh/docs/2005-110/nmed0136.html)

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Chlorodiphenyl (54% chlorine)

Synonyms & Trade Names Aroclor® 1254, PCB, Polychlorinated biphenyl		
CAS No. 11097-69-1	**RTECS No.** TQ1360000 (/niosh-rtecs/TQ14C080.html)	**DOT ID & Guide** 2315 171 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=171) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_3Cl_2C_6H_2Cl_3$ (approx)	**Conversion**	**IDLH** Ca [5 mg/m³] See: IDLH INDEX (/idlh/intridl4.html)
Exposure Limits **NIOSH REL** *: Ca TWA 0.001 mg/m³ See Appendix A (nengapdxa.html) [*Note: The REL also applies to other PCBs.] **OSHA PEL** : TWA 0.5 mg/m³ [skin]		**Measurement Methods** **NIOSH** 5503 (/niosh/docs/2003-154/pdfs/5503.pdf) ; **OSHA** PV2088 (http://www.osha.gov/dts/sltc/methods/partial/t-pv2088-01-8812-ch/t-pv2088-01-8812-ch.html) (http://www.cdc.gov/Other/disclaimer.html) See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.

MW: 326 (approx)	**BP:** 689-734°F	**FRZ:** 50°F	**Sol:** Insoluble	**VP:** 0.00006 mmHg	**IP:** ?
Sp.Gr(77°F): 1.38	**Fl.P:** NA	**UEL:** NA	**LEL:** NA		

Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans, and chlorinated dibenzo-p-dioxins.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes, chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

carcinogen]

Target Organs Skin, eyes, liver, reproductive system

Cancer Site [in animals: tumors of the pituitary gland & liver, leukemia]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See ICSC CARD: 0939 (/niosh/ipcsneng/neng0939.html) See MEDICAL TESTS: 0176 (/niosh/docs/2005-110/nmed0176.html)

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Centers for Disease Control and Prevention 1600 Clifton Rd. Atlanta, GA 30333, USA
800-CDC-INFO (800-232-4636) TTY: (888) 232-6348 - Contact CDC–INFO

Chlorodiphenyl (42% chlorine)

Synonyms & Trade Names Aroclor® 1242, PCB, Polychlorinated biphenyl

CAS No. 53469-21-9	**RTECS No.** TQ1356000 (/niosh-rtecs/TQ14B0E0.html)	**DOT ID & Guide** 2315 171 (http://wwwapps.tc.gc.ca/saf-sec-sur/3/erg-gmu/erg/guidepage.aspx?guide=171) (http://www.cdc.gov/Other/disclaimer.html)
Formula $C_6H_4ClC_6H_3Cl_2$ (approx)	**Conversion**	**IDLH** Ca [5 mg/m3] See: 53469219 (/niosh/idlh/53469219.html)

Exposure Limits

NIOSH REL *: Ca TWA 0.001 mg/m3 See Appendix A (nengapdxa.html) [*Note: The REL also applies to other PCBs.]

OSHA PEL : TWA 1 mg/m3 [skin]

Measurement Methods

NIOSH 5503 (/niosh/docs/2003-154/pdfs/5503.pdf);

OSHA PV2089 (http://www.osha.gov/dts/sltc/methods/partial/t-pv2089-01-8812-ch/t-pv2089-01-8812-ch.html) (http://www.cdc.gov/Other/disclaimer.html)

See: NMAM (/niosh/docs/2003-154/) or OSHA Methods (http://www.osha.gov/dts/sltc/methods/index.html) (http://www.cdc.gov/Other/disclaimer.html)

Physical Description Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor.

MW: 258 (approx)	**BP:** 617-691°F	**FRZ:** -2°F	**Sol:** Insoluble	**VP:** 0.001 mmHg	**IP:** ?
Sp.Gr(77°F): 1.39	**Fl.P:** NA	**UEL:** NA	**LEL:** NA		

Nonflammable Liquid, but exposure in a fire results in the formation of a black soot containing PCBs, polychlorinated dibenzofurans & chlorinated dibenzo-p-dioxins.

Incompatibilities & Reactivities Strong oxidizers

Exposure Routes inhalation, skin absorption, ingestion, skin and/or eye contact

Symptoms irritation eyes; chloracne; liver damage; reproductive effects; [potential occupational carcinogen]

Target Organs Skin, eyes, liver, reproductive system

Cancer Site [in animals: tumors of the pituitary gland & liver, leukemia]

Personal Protection/Sanitation (See protection codes (protect.html))
Skin: Prevent skin contact
Eyes: Prevent eye contact
Wash skin: When contaminated
Remove: When wet or contaminated
Change: Daily
Provide: Eyewash, Quick drench

First Aid (See procedures (firstaid.html))
Eye: Irrigate immediately
Skin: Soap wash immediately
Breathing: Respiratory support
Swallow: Medical attention immediately

Respirator Recommendations

NIOSH

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode
(APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape:
(APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.
Click here (pgintrod.html#nrp) for information on selection of N, R, or P filters.
Any appropriate escape-type, self-contained breathing apparatus

Important additional information about respirator selection (pgintrod.html#mustread)

See also: INTRODUCTION (/niosh/npg/pgintrod.html) See MEDICAL TESTS: 0175 (/niosh/docs/2005-110/nmed0175.html)

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APPENDIX F
CONFINED SPACE ENTRY CHECKLIST/PERMIT

PWGC
CLIENT DRIVEN SOLUTIONS

CONFINED SPACE ENTRY PERMIT

Confined Space □	Hazardous Area □	Non Permit Required □

Notes:
No work will be performed unless the space meets non permit requirements
Permit valid 8 hours only. All copies of permit will remain at this job site until job is completed.
A single entry permit can be filled out prior to start of daily work.
SAFETY STANDBY PERSON IS REQUIRED FOR ALL CONFINED SPACE WORK

Site Location and Description:_____
Purpose of Entry:_____
Supervisor(s) in charge of Crew:_____

Requirements	**Date**	**Time**	**Requirements**	**Date**	**Time**
Lock Out/De-energize/try-out			**Full Body Harness w/"D" Ring**		
Line(s) Broken-capped-blanked			**Emergency Escape Retrieval**		
Purged-Flush and Vent			**Lifelines**		
Ventilation			Fire Extinguishers		
Secure Area (Post and Flag)			Lighting (Explosive Proof)		
Breathing Apparatus			Protective Clothing		
Resuscitator-Inhalator			Respirator(s) (Air Purifying)		
Standby Safety Personnel			Burning and Welding Permit		

BOLD DENOTES MINIMUM REQUIREMENTS TO BE COMPLETED & REVIEWED PRIOR TO ENTRY
Items that do not apply enter N/A in the blank

Monitoring Tests	Permissible Entry Levels	Results (record every 30 minutes beginning ½ hour prior to entry)							
Oxygen	19.5 to 23.5%								
LEL	Below 10%								
Hydrogen sulfide (H_2S)	10ppm† 15ppm‡								

†Short term exposure limit (STEL)
‡8 hour Time weighted average (TWA)

Monitoring Equipment

_____
Type Model # Serial #

_____
Type Model # Serial #

Safety standby person(s):_____

Supervisor authorizing entry:_____

APPENDIX G
EMERGENCY INFORMATION

EMERGENCY PHONE NUMBERS

General Emergencies - New York City Police/Fire Department/Ambulance	911
Non-Emergency Hotline - New York City Police/Fire Department/Ambulance	311
Local Emergency Medical Center (Bronx State Hospital)	1-718-882-3328
National Response Center	1-800-424-8802
Poison Control	1-212-340-4494
NYSDEC Spills Division	1-800-457-7362
NYSDEC Hazardous Waste Division	1-718-482-4994
NYC Office of Environmental Remediation	1-212-788-8841
NYC Department of Health	1-212-788-4711
PWGC Project Director, James Rhodes	1-631-589-6353
PWGC Project Manager, Thomas Melia	1-631-589-6353
PWGC Site Safety Officer, Janelle Cooley (or assignee)	1-516-967-7752

HOSPITAL ROUTE

Montefiore Medical Center
Moses Division
111 E. 210th St., Bronx, NY 10467

0 ¼ ½ Miles

PWGC
Strategic Environmental and Engineering Solutions
P.W. GROSSER CONSULTING, INC.
630 Johnson Avenue, • Suite 7
Bohemia • NY • 11716-2618
Phone: (631) 589-6353 • Fax: (631) 589-8705
E-mail: INFO@PWGROSSER.COM

Project:	BBU1702
Date:	11/22/2017
Designed by:	TM
Drawn by:	TS
Approved by:	TM
Figure No:	1

Document Path: W:\Projects\A-D\BBU\1702\mapfiles\Fig01_HospitalRoute.mxd

PWGC
CLIENT DRIVEN SOLUTIONS

INCIDENT / NEAR MISS REPORT AND INVESTIGATION - PAGE 1 OF 2
TYPE OF INCIDENT - CHECK ALL THAT APPLY
☐ INJURY/ILLNESS ☐ VEHICLE DAMAGE ☐ PROPERTY DAMAGE ☐ FIRE ☐ SPILL/RELEASE ☐ PERMIT EXCEEDENCE ☐ NEAR MISS ☐ OTHER
GENERAL INFORMATION
PROJECT NAME: DATE OF REPORT: REPORT NO.:
DATE OF INCIDENT: TIME: DAY OF WEEK:
LOCATION OF INCIDENT:
WEATHER CONDITIONS: ADEQUATE LIGHTING AT SCENE? ☐ YES ☐ NO ☐ N/A
DESCRIBE WHAT HAPPENED (STEP BY STEP - USE ADDITIONAL PAGES IF NECESSARY)
AFFECTED EMPLOYEE INFORMATION
NAME: EMPLOYEE: ☐ YES ☐ NO
HOME ADDRESS:
SOCIAL SECURITY NO.: HOME PHONE NO.:
JOB CLASSIFICATION: YEARS IN JOB CLASSIFICATION:
HOURS WORKED ON SHIFT PRIOR TO INCIDENT: AGE:
DID INCIDENT RELATE TO ROUTINE TASK FOR JOB CLASSIFICATION? ☐ YES ☐ NO
INJURY/ILLNESS INFORMATION
NATURE OF INJURY OR ILLNESS:
OBJECT/EQUIPMENT/SUBSTANCE CAUSING HARM:
FIRST AID PROVIDED? ☐ YES ☐ NO
IF YES, WHERE WAS IT GIVEN: ☐ ON-SITE ☐ OFF-SITE
IF YES, WHO PROVIDED FIRST AID:
WILL THE INJURY/ILLNESS RESULT IN: ☐ RESTRICTED DUTY ☐ LOST TIME ☐ UNKNOWN

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

INVESTIGATIVE REPORT			
DATE OF INCIDENT:	DATE OF REPORT:	REPORT NUMBER:	
INCIDENT COST: ESTIMATED: $_____		ACTUAL: $_____	
OSHA RECORDABLE(S): ☐ YES ☐ NO # RESTRICTED DAYS ____ # DAYS AWAY FROM WORK ____			
CAUSE ANALYSIS			
IMMEDIATE CAUSES - WHAT ACTIONS AND CONDITIONS CONTRIBUTED TO THIS EVENT?			
BASIC CAUSES - WHAT SPECIFIC PERSONAL OR JOB FACTORS CONTRIBUTED TO THIS EVENT?			
ACTION PLAN			
REMEDIAL ACTIONS - WHAT HAS AND OR SHOULD BE DONE TO CONTROL EACH OF THE CAUSES LISTED?			
ACTION	PERSON RESPONSIBLE	TARGET DATE	COMPLETION DATE
PERSONS PERFORMING INVESTIGATION			
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
INVESTIGATOR'S NAME: (PRINT)	SIGN:	DATE:	
MANAGEMENT REVIEW			
PROJECT MANAGER: (PRINT)	SIGN:	DATE:	
COMMENTS:			
H&S MANAGER: (PRINT)	SIGN:	DATE:	
COMMENTS:			

EXAMPLES OF IMMEDIATE CAUSES

Substandard Actions

Substandard Conditions

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

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

EXAMPLES OF BASIC CAUSES

Personal Factors

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

Job Factors

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

MANAGEMENT PROGRAMS FOR CONTROL OF INCIDENTS

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

APPENDIX H
COMMUNITY AIR MONITORING PLAN

WILLIAMSBRIDGE GARDENS
EAST 211TH – EAST 212TH STREET
BRONX, NEW YORK
NYSDEC BCP ID: C203113

COMMUNITY AIR MONITORING PLAN

SUBMITTED TO:

New York State Department of Environmental Conservation
Region 2
47-40 21st Street
Long Island City, New York 11101

PREPARED FOR:

B&B Urban, LLC
419 Park Avenue South, 7th Floor
New York, New York 10016

PREPARED BY:

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630 Johnson Avenue, Suite 7
Bohemia, New York 11716
Phone: 631-589-6353
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James P. Rhodes, PG, Sr. Principal jimr@pwgrosser.com
Thomas Melia, PG, Sr. Project Manager thomasm@pwgrosser.com

PWGC Project Number: BBU1702

MARCH 2019

HEALTH & SAFETY PLAN
WILLIAMSBRIDGE GARDENS
NYSDEC BCP ID: C203113

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P.W. GROSSER CONSULTING, INC.
PROJECT No. BBU1801
New York State Department of Environmental Conservation
Brownfield Site No. C203113

COMMUNITY AIR MONITORING PLAN

Williamsbridge Gardens
East 211th – East 212th Street
Bronx, New York

SUBMITTED:

March 2019

PREPARED FOR:

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1.0 INTRODUCTION

This Community Air Monitoring Plan (CAMP) provides measures for protection for the downwind community (i.e., off-site receptors including residences, businesses, and on-site workers not directly involved) from potential airborne contaminant releases resulting from investigation and/or remedial action at the Williamsbridge Gardens site, Bronx, New York.

The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that the investigation and/or remedial work did not spread contamination off-site through the air. The CAMP will be implemented as follows:

- Continuous monitoring will be required for all ground intrusive activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.
- Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. Periodic monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

The primary concerns for this site are SVOCs, metals and dust particulates.

1.1 Regulatory Requirements

This CAMP was established in accordance with the following requirements:

- New York State Department of Health's (NYSDOH) Generic Community Air Monitoring Plan: This guidance specifies that a community air-monitoring program shall be implemented to protect the surrounding community and to confirm that the work does not spread contamination off-site through the air.

2.0 AIR MONITORING

The following sections contain information describing the types, frequency and location of real-time monitoring.

2.1 Real-Time Monitoring

This section addresses the real-time monitoring that will be conducted within the work area, and along the site perimeter, during intrusive activities such as excavation, product recovery, manipulation of soil piles, extraction of sheet piling, etc.

Air monitoring data will be documented in a site log book by the designated site safety officer. PWGC's site safety officer or delegate must ensure that air monitoring instruments are calibrated and maintained in accordance with manufacturer's specifications. All instruments will be zeroed daily and checked for accuracy. A daily log will be kept. If additional monitoring is required, the protocols will be developed and appended to this plan.

2.1.1 Air Monitoring Equipment

Air will be monitored for VOCs with a MiniRAE 2000 PID (or equivalent). This instrument is appropriate to measure the types of contaminants known or suspected to be present, and is capable of calculating 15-minute running average concentrations, which will be compared to the levels specified in Section 2.1.2

Fugitive respirable dust will be monitored using a MiniRAM Model PDM-3 aerosol monitor (or equivalent). This instrument is capable of measuring particulate matter less than 10 micrometers in size (PM-10), is capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level, and is equipped with an audible alarm to indicate exceedance of the action level specified in Section 2.1.3.

2.1.2 VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) will be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. VOC monitoring Action Levels are as described below:

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued.

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

All 15-minute readings will be recorded and be available for NYSDEC and/or NYSDOH personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

2.1.3 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. In addition, fugitive dust migration should be visually assessed during all work activities. Particulate monitoring Action Levels are as described below:

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All 15-minute readings will be recorded and be available for NYSDEC and/or NYSDOH personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

3.0 SPECIAL REQUIREMENTS

3.1 Requirements for Work within 20 Feet of Potentially Exposed Individuals or Structures

When work areas are within 20 feet of potentially exposed populations or occupied structures, the continuous monitoring locations for VOCs and particulates must reflect the nearest potentially exposed individuals and the location of ventilation system intakes for nearby structures. The use of engineering controls such as vapor/dust barriers, temporary negative-pressure enclosures, or special ventilation devices should be considered to prevent exposures related to the work activities and to control dust and odors. Consideration should be given to implementing the planned activities when potentially exposed populations are at a minimum, such as during weekends or evening hours in non-residential settings.

- If total VOC concentrations opposite the walls of occupied structures or next to intake vents exceed 1 ppm, monitoring should occur within the occupied structure(s). Background readings in the occupied spaces must be taken prior to commencement of the planned work. Any unusual background readings should be discussed with NYSDOH prior to commencement of the work.
- If total particulate concentrations opposite the walls of occupied structures or next to intake vents exceed 150 mcg/m3, work activities should be suspended until controls are implemented and are successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.
- Depending upon the nature of contamination and remedial activities, other parameters (e.g., explosivity, oxygen, hydrogen sulfide, carbon monoxide) may also need to be monitored. Response levels and actions should be pre-determined, as necessary, for each site.

3.2 Requirements for Indoor Work with Co-Located Residences or Facilities

Unless a self-contained, negative-pressure enclosure with proper emission controls will encompass the work area, all individuals not directly involved with the planned work must be absent from the room in which the work will occur. Monitoring requirements shall be as stated above under “Special Requirements for Work Within 20 Feet of Potentially Exposed Individuals or Structures” except that in this instance “nearby/occupied structures” would be adjacent occupied rooms. Additionally, the location of all exhaust vents in the room and their discharge points, as well as potential vapor pathways (openings, conduits, etc.) relative to adjoining rooms, should be understood and the monitoring locations established accordingly. In these situations, it is strongly recommended that exhaust fans or other engineering controls be used to create negative air pressure within the work area during remedial activities. Additionally, it is strongly recommended that the planned work be implemented during hours (e.g. weekends or evenings) when building occupancy is at a minimum.

4.0 VAPOR SUPPRESSION TECHNIQUES

Vapor suppression techniques must be employed when action levels warrant the use of these techniques.

The techniques to be implemented for control of VOCs from stockpiled soil or from the open excavation will include one or more of the following:

- cover with plastic
- cover with “clean soil”
- application of hydro-mulch material*
- limit working hours to favorable wind and temperature conditions

*This material is a seedless version of the hydro-seed product commonly used by commercial landscaping contractors to provide stabilization and rapid grow-in of grasses or wild flowers along highways, embankments and other large areas. Hydro-mulch can be sprayed over open excavation areas, temporary stockpile areas and loaded trucks, as necessary. This is a highly effective method for controlling odors, because the release of odors is sealed immediately at the source.

5.0 DUST SUPPRESSION TECHNIQUES

Reasonable dust-suppression techniques must be employed during all work that may generate dust, such as excavation, grading, and placement of clean fill. The following techniques were shown to be effective for controlling the generation and migration of dust during remedial activities:

- Wetting equipment and excavation faces;
- Spraying water on buckets during excavation and dumping;
- Hauling materials in properly covered containers; and,
- Restricting vehicle speeds to 10 mph.

Using atomizing sprays will prevent overly wet conditions, conserve water, and offer an effective means of suppressing fugitive dust. It is imperative that utilizing water for suppressing dust will not create surface runoff.

6.0 DATA QUALITY ASSURANCE

6.1 Calibration

Instrument calibration shall be documented in the designated field logbook. All instruments shall be calibrated before each shift. Calibration checks may be used during the day to confirm instrument accuracy. Duplicate readings may be taken to confirm individual instrument response.

6.2 Operations

All instruments shall be operated in accordance with the manufacturer's specifications. Manufacturers' literature, including an operations manual for each piece of monitoring equipment will be maintained on-site by the FTL/HSO for reference.

6.3 Data Review

The Field Team Leader FTL/HSO will interpret all monitoring data based on the action levels specified in Sections 2.1.2 and 2.1.3 and his/her professional judgment. The FTL/HSO shall review the data with the HSM to evaluate the potential for worker exposure, upgrades/downgrades in level of protection, comparison to direct reading instrumentation and changes in the integrated monitoring strategy.

Monitoring and sampling data, along with all sample documentation will be periodically reviewed by the HSM.

7.0 RECORDS AND REPORTING

All readings must be recorded and available for review by personnel from NYSDEC and NYSDOH. Should any of the action levels be exceeded, the NYSDEC Division of Air Resources must be notified in writing within five (5) working days.

The notification shall include a description of the control measures implemented to prevent further exceedances.