JACOBS

Essex-Hope Site
Jamestown, New York

Interim Offsite Vapor Intrusion Investigation Report

Final

March 2019

Essex Specialty Products, Inc.

Essex-Hope Site, Jamestown, New York

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Acronyms and Abbreviations

µg/L	microgram per liter
µg/m^3	microgram per cubic meter
AST	aboveground storage tank
bgs	below ground surface
CBTEX	cumene, benzene, toluene, ethylbenzene, and xylenes
CH2M	CH2M HILL Engineers, Inc.[1]
COC	constituent of concern
CPM	Custom Production Manufacturing Inc.
CSM	conceptual site model
CVOC	chlorinated volatile organic compound
DCE	dichloroethene
EPA	U.S. Environmental Protection Agency
Essex	Essex Specialty Products, Inc.
FD	field duplicate
GC/MS	gas chromatography/mass spectrometry
H&H Metal	H&H Metal Specialty, Inc.
HQ	hazard quotient
HVAC	heating, ventilation, and air conditioning
JMF	Johnson Machine & Fibre Products
LCS/LCSD	laboratory control sample/laboratory control sample duplicate
mL/min	milliliters per minute
NPLS	north parking lot sump
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
O'Brien & Gere	O'Brien & Gere Engineers, Inc.
PARCC	precision, accuracy, representativeness, comparability and completeness
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RAO	remedial action objective
ROD	Record of Decision
Rollform	Rollform of Jamestown, Inc.

[1] CH2M HILL Engineers, Inc. is now a wholly owned subsidiary of Jacobs Engineering Group Inc.

RSL	regional screening level
SSC	soil screening criteria
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TCA	trichloroethane
TCE	trichloroethene
THQ	target hazard quotient
TMB	trimethlybenzene
URS	URS Corporation
UST	underground storage tank
VI	vapor intrusion
VISL	vapor intrusion screening level
VOC	volatile organic compound
WBZ	water-bearing zone
WMS-SE	Waterloo Membrane Sampler

1. Introduction

This vapor intrusion (VI) report presents the details and results of the investigation activities that were performed to further evaluate the potential for VI at offsite buildings above or adjacent to the chlorinated solvent groundwater plume at the Essex-Hope State Superfund site located at 125 Blackstone Avenue in Jamestown, New York (the Site; Figure 1). The Site is listed under the New York Superfund Program (Site Number 907015) and managed by the New York State Department of Environmental Conservation (NYSDEC). A Record of Decision (ROD) was issued in 1994 requiring the implementation of remedial actions at the Site (NYSDEC, 1994).

This work was conducted from November through December 2018 in accordance with the NYSDEC-approved *Offsite Vapor Intrusion Investigation Work Plan, Essex-Hope Site in Jamestown, New York* (CH2M HILL Engineers, Inc. [CH2M], 2018a) and in response to agency comments (New York State Department of Health [NYSDOH], 2017a) on the *Vapor Intrusion Investigation Report, Essex-Hope Site in Jamestown, New York* (CH2M, 2016).

1.1 Scope and Purpose of this Investigation

This investigation was designed to collect additional data to determine if VI associated with the chlorinated volatile organic compound (CVOC) plume from the Site could impact downgradient receptors. Three businesses were selected for this VI investigation due to their proximity to trichloroethene (TCE) in the groundwater plume: Johnson Machine & Fibre Products (JMF), Rollform of Jamestown, Inc., and H&H Metal Specialty, Inc. (H&H Metal). Access to Rollform was denied by the business owner and therefore samples in that business were not included in this field investigation.

The site investigation strategy was influenced by the nature of the existing adjacent businesses—many are metal-working or plastics facilities that are expected to have current and/or historical uses of chlorinated solvents. Thus, external soil vapor and subslab vapor samples were used as initial investigation techniques. Although NYSDOH generally requires subslab vapor and indoor air for decision making related to the VI pathway, collection of external soil vapor in conjunction with subslab vapor improves the ability to distinguish sources attributable to Essex Specialty Products, Inc. (Essex) from other sources.

1.2 Regulatory Guidance

Guidance from the U.S. Environmental Protection Agency (EPA) and NYSDOH that is relevant to this report include:

- *OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air* (EPA, 2015)
- *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006)
- *DER-10 Technical Guidance for Site Investigation and Remediation* (NYSDEC, 2010)

Detected VOC concentrations in subslab soil vapor and exterior soil gas are evaluated against the following regulatory criteria:

- Calculated EPA commercial Vapor Intrusion Screening Levels (VISLs) (EPA, 2018).
- NYSDOH subslab vapor concentrations criteria per *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006) and the May 2017: *Updates to Soil Vapor / Indoor Air Decision Matrices* (NYSDOH, 2017b). Note that indoor air data are required to determine if any further action is needed per the NYSDOH decision matrices.

1.3 Site Background

The 4.7-acre site, which Custom Production Manufacturing Inc. (CPM) currently owns and occupies, is located at 125 Blackstone Avenue in Jamestown, New York (Figure 1). The site is in an industrialized area of the city that has seen various degrees of industrial use over the past 75 years. Contamination onsite is the result of historical practices conducted at the facility as discussed in a 1992 remedial investigation report (O'Brien & Gere Engineers, Inc. [O'Brien & Gere], 1992). TCE; cis-1,2-dichloroethene (cis-1,2-DCE); 1,2,4-trimethlybenzene (TMB); 1,3,5-TMB; vinyl chloride; ethylbenzene; and xylenes are the primary constituents of concern (COCs) in the shallow water bearing zone (WBZ) (7 to 20 feet below ground surface [bgs]). TCE; cis-1,2-DCE; vinyl chloride; and acetone are the primary COCs in the deep WBZ (30 to 50 feet bgs). Vadose zone soil COCs consist of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and PCBs; particularly TCE, xylenes, p-isopropyltoluene, 1,2,4-trimethylbenzene (1,2,4-TMB), and 1,3,5-trimethylbenzene (1,3,5-TMB).

1.4 Historical Operations

Historically, two distinct operations occupied the site: Jamestown Finishes at the southern portion of the site (along Blackstone Avenue) and Hope's Windows in the northern portion (along Hopkins Avenue).

1.4.1 West Building and Former AST and UST Areas

The southern portion of the site is divided into the following subareas for describing the site history and COCs:

- West Building
- Former aboveground storage tank (AST) area
- Former underground storage tank (UST) area

The West Building was built in the early 1900s and subsequently was expanded several times. The West Building was used by a variety of owners/operators to produce paints, varnishes, and other industrial coatings under the name Jamestown Finishes or Jamestown Finishing Products (NYSDEC, 1994). The Former AST Area was northwest of the West Building. Soils and the Shallow WBZ in the West Building and Former AST areas historically have been impacted by cumene, benzene, toluene, ethylbenzene, and xylenes (CBTEX) and, to a lesser extent, TCE and daughter products cis-1,2-DCE and vinyl chloride. East of the West Building is the former UST area, which historically contained USTs for storage of acetone, xylenes, and other solvents used in the production of coatings. Historical impacts in this area included CBTEX in soils and CBTEX and 1,2,4-TMB and 1,3,5-TMB in the shallow WBZ.

1.4.2 Plant 5 Building and North Parking Lot

Hope's Windows previously occupied the northern portion of the site (along Hopkins Avenue). This portion of the site is divided into the following sub-areas for describing the site history and COCs:

- Plant 5 Building
- North Parking Lot

The Plant 5 Building was historically used for the manufacture of window screens until the early 1970s, when manufacturing switched to production of aluminum windows (McFarlene, 1991). The building was also used to store aluminum, and to cut, punch, notch, weld, and assemble aluminum parts.

A TCE degreaser and paint primer tank were present in the southwestern corner of the building but were both removed before Essex Chemical Company purchased the site in 1985. The TCE degreasing pit reportedly was cleaned and pumped to a sump in the North Parking Lot (west of the Plant 5 Building), which was reported to have an earthen bottom (The Dow Chemical Company, 1992). The sump and surrounding soils were excavated in the mid-1990s as one of the ROD remedies (NYSDEC, 1994).

Impacts to soil and groundwater have included polychlorinated biphenyls (PCBs) in soil in the North Parking Lot and TCE and its daughter products (herein referred to as CVOCs in soil, the Shallow WBZ, and the Deep WBZ under the North Parking Lot and the Plant 5 Building. Both shallow and deep groundwater impacts have been detected offsite, with shallow groundwater impacts extending offsite east along Hopkins Avenue and deep groundwater impacts extending offsite to the northeast.

After Essex purchased the Plant 5 Building in 1985, the building reportedly was used as a raw materials warehouse. The building has been used for light metals fabrication since CPM purchased the site in 2000. During a 2014 VI survey, numerous chemicals, including TCE, tetrachloroethene (PCE), petroleum distillates, methyl isobutyl ketone, toluene, methylene chloride, 1,1,1-trichloroethane (TCA), and acetone were observed stored at the facility (URS Corporation [URS], 2015).

1.5 Remedial Actions

Numerous remedial actions have been undertaken at the site in response to the 1994 ROD. Remedial actions have included a pump and treat system that continues to extract and treat shallow and deep groundwater; soil excavation in the North Parking Lot; air sparging of Shallow WBZ in the North Parking Lot, Former AST, and Former UST areas; and soil vapor extraction (SVE) of vadose zone soils in these same areas; the air sparge/SVE system has ceased operation. Supplemental and voluntary remedial actions implemented include removing the USTs and adjacent soil, conducting a pilot test of zero-valent iron injections in the North Parking Lot, installing a subslab vapor mitigation system at an offsite residence, and implementing in situ chemical oxidation injections in the Shallow WBZ in the Former UST Area and the Deep WBZ near the northeastern corner of the former Plant 5 Building in 2012 (VeruTEK Technologies, 2010; URS, 2012).

Currently, five operational recovery wells are part of the existing pump and treat system. Recovery wells are located in the North Parking Lot and downgradient along Hopkins Avenue.

1.6 Current Conditions in Shallow Groundwater

Shallow groundwater with COCs exceeding remedial action objectives (RAOs) exists onsite and offsite. In summary, Shallow WBZ exceedances consist of three distinct plumes: 1) the CVOC plumes (in the North Parking Lot Sump [NPLS] Area and offsite); 2) a petroleum-constituent plume (primarily CBTEX) under the West Building; and 3) a petroleum-constituent plume (primarily 1,2,4-TMB and 1,3,5-TMB) in the Former UST Area. Details of the current conditions are presented in the *2017 Annual Periodic Review Report, Essex-Hope Site, Jamestown, New York* (CH2M, 2018b). The ongoing pump-and-treat system for the Shallow WBZ consists of two operating recovery wells (RW-1S and RW-2S). RW-3S in the Former AST/UST Area was shut off in August 2017 due to declining concentrations.

The focus of this investigation is mainly on the offsite plume for TCE, cis-1,2-DCE, and vinyl chloride, which are found in shallow groundwater (which fluctuates seasonally between 8 to 12 feet bgs) north and east-northeast of the Site along Hopkins Avenue. The soil gas sampling and sewer sampling included in this current investigation also helps evaluate potential vadose zone and utility transport pathways.

The most recent groundwater COC concentrations from the 2017 sampling event (CH2M, 2018b) and November 2018 sampling event (report in progress) are presented on Figure 2. Table 1 presents the nearby monitoring well concentrations and a comparison to EPA commercial groundwater VISLs at a target risk for carcinogens (TCR) of 10^{-6} and a target hazard quotient for non-carcinogens (THQ) of 1 (EPA, 2018).

1.7 Inclusion Zone and Sampling Rationale

Sampling was conducted to evaluate potential VI in the offsite properties located near the CVOC groundwater plume. Vadose zone and sewer pipe transport were also assessed during this VI sampling event.

In the absence of a New York State groundwater screening level, the VI screening level of 7 micrograms per liter (µg/L) was calculated using the EPA vapor intrusion screening level (VISL) calculator (total cancer risk = 10^{-6}, hazard quotient [HQ] = 1 calculator version 3.5.1, which is based on the most recent regional screening levels at the time of workplan submittal [EPA, 2017]) for a commercial/industrial setting and the standard 100-foot buffer beyond the plume to define the inclusion zone. At least three industrial businesses that had not already been evaluated for VI were identified to be within the inclusion zone: JMF, Rollform, and H&H Metal. Access to Rollform was denied by the business owner and therefore planned sampling in that business was not included in the field investigation.

1.8 Constituents of Interest

Results from the updated conceptual site model (CSM; CH2M, 2018c) indicate TCE, cis-1,2-DCE, and vinyl chloride are the primary constituents of interest. However, several other chlorinated solvents were included for VOC fingerprinting to serve as additional lines of evidence in this investigation.

Target Compound List:
Trichloroethene
Tetrachloroethene (PCE)
cis-1,2-Dichloroethene (cis-1,2-DCE)
trans-1,2-Dichloroethene (trans-1,2-DCE)
1,1-Dichloroethene (1,1-DCE)
Vinyl chloride

2. Field Activities

An initial site walkthrough of properties and buildings proposed for VI sampling was conducted at the end of April 2018. Vapor intrusion investigation activities were conducted at the sites from November 6 through November 16, 2018, and December 11 through December 13, 2018. Procedures and methodology detailed in the work plan (CH2M, 2018a) were followed. The fieldwork consisted of the following activities:

- Updating building surveys at the two businesses that have allowed access
- Performing utility locates
- Conducting a shallow soil vapor survey (7-foot depth bgs)
- Installing and sampling subslab vapor probes
- Performing a preferential pathway assessment (sewer gas sampling at select utilities)

The following table summarizes the daily field activities:

Date	Activities Performed
April 27, 2018	• Performed building surveys
November 6-7, 2018	• Utility locate
November 12, 2018	• Deployed preferential pathway samplers • Began drilling/installing soil vapor probes (3 probes installed)
November 13, 2018	• Installed subslab probes in H&H Metals (7 probes installed) • Continued drilling and installing soil vapor probes (13 probes installed)
November 14, 2018	• Installed subslab probes in Johnson Machine (4 probes installed) • Sampled all 4 subslab probes in Johnson Machine (After waiting 3+ hours post installation) • Completed the installation of soil vapor probes (Cementing the finishes)
November 15, 2018	• Sampled all 7 subslab probes in H&H Metals
November 16, 2018	• Retrieved preferential pathway samples • Shipped sample canisters and sewer gas samples to respective laboratories
December 11-13, 2018	• Sampled 16 exterior soil vapor probes

The VI investigation field activities are detailed below.

2.1 Initial Site Walk/Building Surveys

On April 27, 2018, building surveys at H&H Metals and JMF were conducted to characterize the building; to understand the heating, ventilation, and air conditioning (HVAC) conditions; to evaluate floor plans and facility usage; to visually identify potential background CVOC sources; and to determine the optimal subslab sampling locations. Documentation was conducted using the questions listed in NYSDOH's building questionnaire (NYSDOH, 2006), and is included as Appendix A.

2.2 Utility Locate

On November 6 and 7, 2018, New York Leak Detection, Inc. performed a utility locate to clear the locations for 16 exterior soil vapor probes and 11 interior subslab vapor probes. Some locations were adjusted to accommodate nearby utilities. Final soil vapor and subslab vapor probe locations are presented on Figure 3. Details are included in the field report in Appendix B.

2.3 Preferential Pathway Assessment

A preferential pathway assessment was performed from November 12 through 16, 2018 in six different access points of sanitary and storm sewers (three in each) that pass through the area of the CVOC groundwater plume beneath Hopkins Avenue, Bigelow Street, and between the Site and the JMF and the Rollform businesses (Figure 4).

The depth to the water/wastewater in the sewer was measured with a laser distance finder in each manhole. Samples were collected using Waterloo Membrane Sampler (WMS-SE) passive samplers provided by Eurofins Air Toxics that were suspended via string approximately 2 feet above the water/wastewater's surface measured before deployment. The samplers were recovered from the sanitary sewers and storm sewers after 5 days to account for temporal variability. All six locations had little to no water at the bottom of the manhole. Weather varied throughout the sampling period from freezing rain to heavy snow.

The samples were shipped via FedEx to Eurofins Air Toxics (NYSDOH Environmental Laboratory Approval Program, New York Laboratory Identification Number 11291) to perform the TO-17 analysis. Preferential pathway samples were analyzed in accordance with *Compendium Method TO-17: Determination of VOCs in Ambient Air Using Active Sampling onto Sorbent Tubes (*Gas Chromatography/Mass Spectrometry [*GC/MS*]*)* (EPA, 1999a).

2.4 Subslab Vapor Survey

Subslab vapor probes were installed at 11 locations in the two business that have allowed access within the inclusion zone: JMF and H&H Metal. Subslab vapor probe locations are provided on Figure 3. On November 13, 2018, seven subslab vapor probes were installed at H&H Metal. These probes were sampled on November 15, 2018. On November 14, four subslab probes were installed and sampled at JMF.

Cox Colvin Vapor pins were installed into the boreholes that were drilled in the building floor, using an industrial hammer drill equipped with concrete masonry drill bits. The probes were allowed to equilibrate for at least 2 hours and then checked for leaks using helium during purging to ensure ambient air was not introduced along with the subslab vapor sample. Vapor samples were collected using 1-liter SUMMA canisters over a 5-minute period at 200 milliliters/minute (mL/min). Tables 2 and 3 summarize the sampling details. Following subslab soil vapor sample collection, the vapor pins were left in place and covered with a flush mount cap.

Samples were shipped via FedEx to Alpha Analytical (NYSDOH Environmental Laboratory Approval Program, New York Laboratory Identification Number 11627) to perform the TO-15 analysis. Alpha Analytical supplied batch-certified clean, evacuated, stainless-steel SUMMA canisters with individual tracking numbers and calibrated flow regulators. Soil vapor samples were analyzed in accordance with *Compendium Method TO-15: Determination of VOCs in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (EPA, 1999b). A 14-day turnaround time was requested for sample analysis.

2.5 Shallow Soil Vapor Survey

Soil vapor probes were installed at 16 of the proposed locations shown on Figure 3. The work plan proposed 17 soil vapor locations; however, several locations were on Rollform's property. These locations were moved off the Rollform property to nearby locations due to denied access. Proper coverage was obtained with 16 soil vapor probes, as opposed to 17 probes. The locations were selected to get spatial coverage above the groundwater inclusion zone and on readily accessible areas to the north and the east of the Site. Shallow soil vapor probes were installed from November 12 through 14, 2018 and sampled December 11 through 13, 2018.

Weather varied throughout the installation and sampling process. During the installation, temperatures were steadily in the -1-degree Celsius range and several feet of snow was received. Sampling was proposed for the week of November 26, 2018, but heavy rains postponed sampling to the week of December 10, 2018. Several inches of snow were on the ground during the sampling event and temperatures were steadily in the -7-degree Celsius range.

Semi-permanent probes were installed by a New York State licensed driller, Parratt Wolff, with a direct-push drilling rig at a depth of 1 foot above the shallow ground water table (7 feet bgs). The 6-inch-long, polyvinyl chloride (PVC) probes were placed in a 1-foot-long sand pack. The borehole was completed to ground surface with a 6-inch layer of dry bentonite powder, then hydrated bentonite, and a flush mount well cover.

The probes were checked for leaks using a helium filled shroud at the surface and a dielectric MGM-2002 field helium detector during purging to ensure ambient air was not introduced along with the soil vapor sample. Vapor samples were collected using 1-liter SUMMA canisters over a 5-minute period. Table 4 presents the sample details. Soil vapor probe installation logs are provided in Appendix C.

Samples were picked up by an Alpha courier and hand delivered to Alpha Analytical (NYSDOH Environmental Laboratory Approval Program, New York Laboratory Identification Number 11627) to perform the TO-15 analysis. Alpha Analytical supplied batch-certified clean, evacuated, stainless-steel SUMMA canisters with individual tracking numbers and calibrated flow regulators. Soil vapor samples were analyzed in accordance with *Compendium Method TO-15: Determination of VOCs in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)* (EPA, 1999b). A 14-day turnaround time was requested for sample analysis.

2.6 Quality Assurance/Quality Control

Quality assurance (QA)/quality control (QC) samples included duplicate samples collected at a 10 percent frequency (two soil vapor and two subslab vapor samples). For canister samples, the tubing from the field duplicate (FD) was connected to the parent canister using a “T” fixture, so the samples collected the same air from the probe once the valves were opened simultaneously. One trip blank sample was analyzed for the preferential pathway samples.

Samples were placed in appropriate shipping containers and shipped via overnight courier under standard chain-of-custody to the laboratory for analysis and/or picked up by a courier.

The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability and completeness (PARCC) as described in the Quality Assurance Project Plan (QAPP; CH2M, 2018c). The samples were reported in three sample delivery groups identified as 1811372R1, L1847517, and L1851659. The sample delivery groups were assessed by reviewing the following:

- The chain-of-custody documentation
- Holding-time compliance
- Calibration
- Method blanks/field blanks
- Laboratory control spiking sample/laboratory control spiking sample duplicate (LCS/LCSD) recoveries and precision
- Internal standard recoveries
- Surrogate spike recoveries
- FD precision
- Required method QC samples at the specified frequencies.

During review, some discrepancies were noticed between the parent sample and the FDs in both SV-07 and SV-10, even though the canisters were linked together through a sample tee with a single flow controller. The project chemist investigated this issue with the laboratory. A thorough investigation of the certification and canister cleaning process, the gas used for cleaning the canisters and the prior detections in the canisters was conducted. Humidified ultra-pure nitrogen is used during the cleaning of the canisters. While reviewing the previous detections from prior use of the canisters for the compounds of concern at the site, it did not appear that previous detected concentrations would have affected the results.

The data quality review indicates that all data were considered valid. No severe QC issues were encountered, and no analytical data were rejected during the review process. Detailed summaries of the data quality review findings are provided in Appendix D. All analytical results, including those qualified during the data quality review, may be used to support project decisions.

3. Results

3.1 Initial Site Walk/Building Surveys

On April 27, 2018, building surveys at H&H Metals and JMF were conducted to characterize the building and to identify things such as soil vapor entry points or background indoor sources of VOCs that could potentially affect sampling results in relation to VI. The building surveys are presented in Appendix A.

3.1.1 H&H Metals

During the building survey, an onsite interview was conducted with Brian Ceci. H&H Metals was a metal fabrication facility that included welding, brazing and stamping. Operations in this building have recently ceased, and the building is currently unoccupied and for sale. Materials and equipment used in former operations are still present in the building. The building is a one-story slab on grade building. The building was constructed over several different phases and consists of five separately poured slabs ranging from 1920 through 1999. Indoor air in the building is recirculated by an HVAC system and blower in the manufacturing, welding and press room. There is potential substantial outdoor air infiltration from windows and doorways in the non-insulated areas. The roof leaks water during episodes of rain in the welding room and the former chimney is currently capped. Several potential soil vapor entry points were identified during the survey. There were several cracks identified in the floor in the welding and press rooms, utility trenches in the press room, floor drains in the bathrooms and manufacturing area, and a trench pit for a press that was filled with gravel and is approximately 5 feet deep and 4 feet long by 5 feet wide.

Chlorinated solvents may have been used during past operations; however, no products containing target compounds were identified during the building survey.

3.1.2 Johnson Machine & Fibre Products

Michael Marshall was interviewed during the building survey at JMF, a metal fabrication facility that is currently in operation. The building is a single-story slab on grade construction and approximately 30 years in age. Indoor air is recirculated by an HVAC system and blower in the manufacturing area and there is potential outdoor air infiltration from doors and windows. Several cracks were identified in the slab of the manufacturing area and there were floor drains identified in the bathroom and manufacturing area.

Solvent and lubricant odors were identified in the building during the building survey. Solvent use in the building was visible, however, no products containing the chlorinated target compounds were identified during the walk through.

3.2 Preferential Pathway Assessment

A preferential pathway assessment was performed at six access points to the sanitary and storm sewers, shown on Figure 4, that pass through an area of the Site within the extent of the CVOC groundwater plume beneath Hopkins Avenue, Bigelow Street, and between the Site and the JMF and the Rollform businesses. There are no established screening levels for preferential pathway samples, but when compared to the EPA VISLs for soil vapor, there were no exceedances. Results are shown in Table 5 and are discussed below.

- All storm drains (3) and one sanitary sewer (WMS-SE-06) had no detections of the target compounds.
- WMS-SE-02 had a cis-1,2-DCE concentration of 140 micrograms per cubic meter (µg/m^3), a TCE concentration of 94 µg/m^3, and a PCE concentration of 0.94 µg/m^3. All other target compounds were not detected. This location was a sanitary sewer located in the middle of Hopkins Avenue directly across from JMF.

- WMS-SE-04 had a had a cis-1,2-DCE concentration of 25 µg/m^3 and a TCE concentration of 26 µg/m^3. All other target compounds were not detected. This location was a sanitary sewer in the middle of Hopkins Avenue and at the intersection of Minsker Street.

3.3 Subslab Vapor Survey

Eleven subslab locations were sampled within the offsite properties referred to as H&H Metal and JMF facility. Detected VOC concentrations in sub-slab soil vapor were evaluated against the following criteria:

1) EPA commercial subslab VISLs at a TCR of 10^{-6} and a THQ of 1 (EPA, 2018).
2) NYSDOH subslab vapor concentrations criteria per *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006).

Laboratory analytical reports are provided in Appendix E. Notification letters were sent to the owners of H&H Metal (Dow, 2019a) and JMF (Dow, 2019b) directly by Dow on January 19, 2019, discussing the results of the subslab vapor survey within each building respectively. The notification letters are provided in Appendix F.

3.3.1 H&H Metal Specialty, Inc

Seven subslab locations were sampled within the H&H Metal facility as shown on Figure 5, with the respective results summarized on the figure and listed in Table 6. At the time of sampling, the facility was vacant and listed for sale. Cis-1,2-DCE, TCE, and PCE were detected at concentrations greater than NYSDOH and/or EPA soil vapor screening criteria in various samples. Only two subslab soil vapor sample results (HH-06 and HH-07) exceeded both the NYSDOH and EPA soil vapor screening criteria for TCE. The other target compounds were not detected in any of the seven sample locations (vinyl chloride, 1,1-DCE, trans-1,2-DCE).

3.3.2 Johnson Machine & Fibre Products

Four subslab locations were sampled within the JMF facility as shown on Figure 5, with the respective results listed in Table 7. At the time of sampling, the facility was occupied and in operation. Cis-1,2-DCE and/or TCE were detected at concentrations greater than the most conservative NYSDOH soil vapor screening criteria in all four samples collected within the facility. The other target compounds (vinyl chloride, 1,1-DCE, trans-1,2-DCE, and PCE) were not detected or were detected at concentrations lower than the screening levels. There are no sub-slab soil vapor sample results in exceedance of the EPA VISLs.

3.4 Shallow Soil Vapor Survey

Sixteen soil vapor probes were sampled at locations within the groundwater inclusion zone and on readily accessible areas to the north and the east of the Site as shown on Figure 6, with respective results presented on the figure and listed in Table 8. These probe sampling locations included locations bordering H&H Metal., JMF, and Rollform (not within the Rollform property boundaries).

Detected VOC concentrations in soil vapor were evaluated against the following criteria:

1) EPA commercial VISLs at a TCR of 10^{-6} and a THQ of 1 (EPA, 2018).

Five shallow vapor samples are in exceedance of the EPA soil vapor screening criteria, two samples are in exceedance for TCE, and three samples are in exceedance for vinyl chloride.

4. Data Evaluation

An evaluation of the subslab soil vapor, soil vapor, preferential pathway, and groundwater data are summarized below. The focus of the evaluation is on specific COCs that exceeded one or more of the screening levels, which include PCE, TCE, cis-1,2-DCE, and vinyl chloride. PCE is not considered a COC from the Essex site groundwater plume; however, it was detected at both properties in soil gas and is therefore evaluated as part of this section.

4.1 H&H Metals

H&H Metals is located in the northeastern extent of the groundwater plume. There are four shallow monitoring wells that surround the perimeter of the building: MW-105S, MW-109S, MW-108S, and MW-106S. Due to exceedances of TCE and vinyl chloride at one or more wells (Figure 2), this property was chosen to be evaluated for the potential for VI. Therefore, a total of seven subslab vapor probes were installed at H&H Metal. Additionally, a total of five exterior soil vapor samples were installed adjacent to the property (SV-05, SV-07, SV-11, SV-12, and SV-13) to be used as part of the evaluation. Based on this and the results detailed in Section 3, the following has been evaluated as part of the soil gas results:

4.1.1 TCE

- As detailed on Figure 2, TCE has historically been detected in groundwater at concentrations in exceedance of EPA groundwater VISL at two monitoring wells (MW-106S and MW-108S).
- TCE was only detected at three out of the five exterior soil vapor locations.
- Concentrations of TCE in subslab soil vapor exceeded the NYSDOH soil screening criteria (SSC) in all locations sampled at H&H Metals, and two locations (HH-06 and HH-07) also exceed the EPA VISL.

In summary, concentrations of TCE in the external soil vapor are generally lower than concentrations in subslab soil vapor beneath the buildings. It is unknown at this time whether this reflects a capping effect of the building on vapors moving up from groundwater or a release of TCE specific to H&H metals. Sampling of the soil vapor probes occurred after a week of heavy rain and intermittent snow storms. The ground was frozen and snow-covered for the sampling event. It is possible that due to these weather conditions and potentially saturated soils, soil vapor results were biased low and/or there may be additional subsurface sources near the building. The already planned second sampling round will provide insight into the effect of weather on soil gas concentrations.

4.1.2 Cis-1,2-DCE

- As detailed on Figure 2, cis-1,2-DCE has historically been detected at adjacent monitoring wells (MW-106S and MW-108S); however, there are no EPA groundwater VISLs for cis-1,2-DCE.
- At two out of five exterior soil vapor locations, cis-1,2-DCE was detected above laboratory detections limits; however, there are no soil vapor NYSDOH SSC for external soil gas or EPA VISLs for cis-1,2-DCE.
- Five out of seven subslab soil vapor samples at H&H Metals have concentrations of cis-1,2-DCE that exceed the NYSDOH SSC.

In summary, concentrations of cis-1,2-DCE in soil vapor are generally lower than concentrations in subslab soil vapor beneath the buildings. It is possible that due to weather conditions soil vapor results were biased low, and/or there may be additional subsurface sources near the building.

4.1.3 Vinyl Chloride

Vinyl chloride was detected at a nearby shallow monitoring well MW-106S at a concentration in exceedance of the EPA groundwater VISL and was subsequently detected at the immediately adjacent

soil gas (SV-07) above the applicable EPA soil vapor VISL. However, no other nearby monitoring wells or soil vapor probes had detections of vinyl chloride and vinyl chloride was not detected in subslab soil vapor beneath H&H Metals; therefore, it is not currently a VI concern. Vinyl chloride typically rapidly degrades under aerobic conditions in the vadose zone.

4.1.4 PCE

- As detailed on Figure 2, PCE was detected at MW-108S at low concentrations, below EPA VISLs, and at least 2 orders of magnitude lower than concentrations of TCE in shallow groundwater.
- PCE was detected at two out of five exterior soil vapor samples, generally in areas west of the H&H Metals. Results were below the EPA soil vapor VISL.
- PCE was detected in subslab vapor beneath H&H Metals in all but one location (HH-03). One location (HH-04) exceeded the NYSDOH SSC for PCE but not the EPA VISL.

PCE is not a COC from the Essex site groundwater plume. PCE was detected at much higher concentrations relative to TCE (within 1 order of magnitude) in many of the soil vapor and subslab soil vapor samples beneath both buildings. The presence of PCE (not a COC at the Site) and difference in the ratio of TCE to PCE in soil vapor and subslab soil vapor suggests the potential for other offsite sources of PCE.

4.2 Johnson Machine & Fibre Products

JMF is located above the southern edge of the groundwater plume. There are four shallow monitoring wells that surround the perimeter of the building: MW-25S, MW-18S, VP-6S, and MW-27S. Due to exceedances of TCE at one or more wells (Figure 2), this property was chosen to be evaluated for the potential for VI. Therefore, a total of four subslab vapor probes were installed at JMF. Additionally, a total of four exterior soil vapor samples were installed adjacent to the property (SV-08, SV-09, SV-10, and SV-11) to be used as part of the evaluation. Based on this and the results detailed in Section 3, the following has been evaluated as part of the soil gas results:

4.2.1 TCE

- As detailed on Figure 2, TCE has been detected in groundwater at concentrations in exceedance of EPA groundwater VISL at two monitoring wells (MW-18S and MW-25S).
- TCE was detected below the EPA soil vapor VISL at all four exterior soil vapor locations.
- TCE was detected in subslab soil vapor in exceedance of the NYSDOH SSC in all locations sampled at JMF; however, it was below the EPA subslab VISL.

Concentrations of TCE in the subslab soil vapor were greater than concentrations of TCE in all the nearby soil vapor probes, which was also the case at H&H Metals as stated above. This may reflect a capping effect of the building on vapors arising from groundwater temporal variability in external soil gas due to weather conditions and potentially saturated soils, and/or there may be additional subsurface sources near the building. The already planned second sampling round will provide insight into the effect of weather on soil gas concentrations.

4.2.2 Cis-1,2-DCE

- As detailed on Figures 2 and 6, cis-1,2-DCE has been detected in groundwater at two monitoring wells (MW-18S and MW-25S) and in exterior soil vapor at one location (SV-10); however, there are no groundwater or external soil vapor NYSDOH SSC or EPA VISLs for cis-1,2-DCE.
- Cis-1,2-DCE was detected in subslab soil vapor in exceedance of the NYSDOH SSC in all locations sampled at JMF, except for one (JMF-02), but was still detected in that location.

Concentrations of cis-1,2-DCE in soil vapor are generally lower than concentrations in subslab soil vapor beneath the building. As stated before, it is possible that due to weather conditions, soil vapor results were biased low and/or there may be additional subsurface sources near the two buildings.

4.2.3 Vinyl Chloride

Vinyl chloride was detected at a nearby shallow monitoring well MW-18S at a concentration well below the EPA groundwater VISL; however, it was detected in nearby soil vapor sample SV-10 (near southwest corner of the building) at a concentration exceeding the EPA soil vapor VISL. No other nearby monitoring wells or soil vapor probes had detections of vinyl chloride and vinyl chloride was not detected in subslab soil vapor beneath JMF; therefore, it is not currently a VI concern. Vinyl chloride is known to degrade readily in aerobic vadose zone soils.

4.2.4 PCE

As detailed in Section 4.1.4, PCE is not a COC at the Site and has not been detected in any of the four shallow monitoring wells surrounding JMF; however, it was detected in two nearby soil vapor samples and at three out of four subslab soil vapor locations. As all of these results were below the applicable NYSDOH SSC or EPA VISL, it is not currently a VI concern at JMF. These soil vapor results indicate there may be additional subsurface sources of PCE near the building.

4.3 Additional Observations

As shown on Figure 2 and detailed above, a shallow CVOC plume extends from the Site to the north and east, roughly parallel to Hopkins Avenue. The other exterior soil gas samples (not discussed above) were evaluated to understand the impacts that this plume has on soil gas and nature and extent of impacts. Of the other exterior soil vapor samples evaluated that were not immediately adjacent to H&H Metals and JMF, only two locations (of six) exceeded the EPA VISL. This included SV-01 (262 µg/m^3 of TCE) which is near the center of the groundwater plume and is more than 100 feet from any buildings and SV-16 (111 µg/m^3 of TCE). SV-16 is outside of the 100-foot groundwater inclusion zone and lower concentrations of TCE were observed in soil vapor samples collected closer to the groundwater plume (SV-13, SV-14, and SV-15). It is possible that there is another potential subsurface source of TCE near SV-16.

In addition to the elevated concentrations of PCE detected in soil vapor west of H&H Metals and JMF, PCE was also detected in SV-16. As stated above, PCE is not a contaminant of concern from the Site groundwater plume and is not detected in the closest upgradient groundwater well MW-107S. SV-16 sample also had an unusually high concentration of TCE. This adds additional evidence for potential other offsite sources of CVOCs.

Concentrations of target compounds in the sewer gas samples are relatively low and below EPA soil vapor commercial VISLs. Although soil vapor VISLs do not directly apply to sewer gas, they can be used as an indicator of relative strength. It is unlikely that these concentrations cause exceedances of applicable screening levels in indoor air due to dilution from potential points of entry into indoor air..

5. Conclusions and Recommendations

Based on the initial data evaluation, there is the potential for a complete VI pathway from the WBZ plume for site-related COCs, TCE, and cis-1,2-DCE. However, due to the presence of PCE in subsurface samples and the relatively low concentrations of TCE and cis-1,2-DCE in soil vapor, it is possible that additional sources of VOCs are present in the subsurface at adjacent sites. It is recommended that the 16 exterior soil probes and the sewer sampling locations undergo another full round of sampling in warmer and drier conditions (summer months) to confirm sampling results from this round of sampling and account for temporal variability. The following recommendations are being made for the two offsite buildings:

5.1 H&H Metals

Concentrations of TCE in subslab soil vapor exceeded the NYSDOH SSC in all locations sampled at H&H Metals, and two locations (HH-06 and HH-07) also exceed the EPA VISL. It is recommended that one additional round of sampling be conducted of the subslab soil vapor in the summer months to confirm results from this sampling event. Also, based on the results during the first round of sampling, indoor air sampling is proposed to evaluate if a complete VI pathway has occurred. This property is currently unoccupied and for sale and therefore there are currently no receptors; however, this allows for indoor air sampling to occur without manufacturing activities and less opportunity for interference from background indoor sources. A short work plan will be compiled to outline the indoor air sampling details and this sampling will be performed concurrently with the proposed additional subslab sampling event.

5.2 Johnson Machine & Fibre Products

Concentrations of TCE and cis-1,2-DCE in subslab soil vapor exceeded the NYSDOH SSC at JMF; however, no locations exceeded the EPA subslab VISLs. It is recommended that one additional round of sampling be conducted of the subslab soil vapor in the summer months to confirm results from this sampling event.

6. References

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Tables

Table 1. EPA Groundwater Vapor Intrusion Screening Level Comparison with Nearby Wells

Winter 2018/2019 Interim Offsite Vapor Intrusion Evaluation

Essex-Hope Site, Jamestown, New York

			RW-1S		RW-2S		RW-3S		MW-7S	MW-101S		MW-102S		MW-103S	MW-104S		MW-105S	
Cas #	**Parameter Name**	**EPA Groundwater VISL (µg/L)**	**2018**	**2017**	**2018**	**2017**	**2018**	**2017**	**2017**	**2018**	**2017**	**2017**	**2017 DUP**	**2017**	**2018**	**2017**	**2018**	**2017**
75-01-4	Vinyl chloride	2.5	**14**	**6**	**0.84 J**	**2**	**2.9**	**1.6**	1.0 UJ	**0.2 J**	**2.3 J**	**0.16 J**	**0.15 J**	**0.17 J**	ND	1.0 UJ	ND	ND
156-59-2	cis-1,2-Dichloroethene	NA	**360**	**91**	**24**	**31**	**5.4**	**37**	**14**	**26**	**240**	**44**	**45**	**70**	ND	**1.0 J**	ND	ND
79-01-6	Trichloroethene	7.4	**260**	**26**	**35**	**14**	**8.1**	**56**	**7.1**	**75**	**510**	**30**	**30**	**180**	**100**	**130**	ND	ND
127-18-4	Tetrachloroethene	65	ND	ND	ND	ND	ND	ND	ND	**0.27 J**	ND	ND	ND	ND	**0.26 J**	ND	ND	ND

Notes:

Exceedance of EPA Groundwater VISL

µg/L = micrograms per liter

EPA = U.S. Environmental Protection Agency

VISL = vapor intrusion screening level

Table 1. EPA Groundwater Vapor Intrusion Screening Level Comparison with Nearby Wells

Winter 2018/2019 Interim Offsite Vapor Intrusion Evaluation

Essex-Hope Site, Jamestown, New York

			MW-106S	MW-107S	MW-108S				MW-109S	MW-12	MW-13		MW-14S	MW-15S	MW-18S	MW-25S	MW-27S	
Cas #	Parameter Name	EPA Groundwater VISL (µg/L)	2017	2017	2018	2018 DUP	2017	2017 DUP	2017	2017	2018	2017	2017	2017	2017	2017	2018	2017
75-01-4	Vinyl chloride	2.5	**6.4**	ND	ND	ND	ND	ND	ND	1.0 UJ	ND	**1.3**	ND	1.0 UJ	**0.34 J**	ND	ND	ND
156-59-2	cis-1,2-Dichloroethene	NA	**11**	ND	**5.8**	**5.8**	**4.6**	**4.6**	ND	**37**	ND	**5.5**	**2.4 J**	**1.0 J**	**65**	**21**	ND	ND
79-01-6	Trichloroethene	7.4	**13**	ND	**28**	**28**	**22**	**22**	ND	**18**	ND	**22**	**14**	**5.6**	**190**	**82**	ND	ND
127-18-4	Tetrachloroethene	65	ND	ND	**0.31 J**	**0.33 J**	**0.48 J**	**0.48 J**	**0.26 J**	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

Exceedance of EPA Groundwater VISL

µg/L = micrograms per liter

EPA = U.S. Environmental Protection Agency

VISL = vapor intrusion screening level

Table 1. EPA Groundwater Vapor Intrusion Screening Level Comparison with Nearby Wells

Winter 2018/2019 Interim Offsite Vapor Intrusion Evaluation

Essex-Hope Site, Jamestown, New York

			VP-6S		GP-1S	HW-6	DPT-011	DPT-012
Cas #	Parameter Name	EPA Groundwater VISL (µg/L)	2018	2017	2017	2017	2017	2017
75-01-4	Vinyl chloride	2.5	ND	ND	**0.33 J**	**250**	ND	ND
156-59-2	cis-1,2-Dichloroethene	NA	ND	ND	**16**	**180**	**11**	ND
79-01-6	Trichloroethene	7.4	**0.31 J**	ND	**18**	ND	**21 J**	**6.0 J**
127-18-4	Tetrachloroethene	65	ND	ND	ND	ND	ND	ND

Notes:

Exceedance of EPA Groundwater VISL

µg/L = micrograms per liter

EPA = U.S. Environmental Protection Agency

VISL = vapor intrusion screening level

Table 2. Subslab Soil Gas Sampling Log—Winter 2018/2019 Interim Offsite Vapor Intrusion Investigation
HH Metal Specialty, Inc.
153 Hopkins Avenue
Essex-Hope Site, Jamestown, New York

Field ID	Purge and Sample Start Date	Purge Start Time	Purge Rate (mL/min)	Purge End Time	Helium Leak Check[1] (pass/fail)	Total VOCs in Purged Gas (ppm)	MultiRae from Purged Gas (%v)			Canister ID	Flow Controller ID	Flow Controller Rate	Sample Start Time	Initial Canister Pressure ("Hg)		Sample End Date	Sample End Time	Final Pressure ("Hg)		Lab Receipt Pressure ("Hg)
							Oxygen	Carbon Dioxide	H2S					On Can	Digital Gauge			On Can	Digital Gauge	
HH-01_20181115	11/13/2018	9:38	200	9:43	Pass	0.0	17.5	8	0	800	0852	5 min	9:46	-28.45	-29.10	11/13/18	9:51	-2.10	-2.19	-1.70
HH-02_20181115	11/13/2018	10:04	200	10:09	Pass	0.0	19.2	2	0	721	0670	5 min	10:13	-28.17	-28.69	11/13/18	10:17	-1.64	-1.76	-1.40
HH-03_20181115	11/13/2018	11:18	200	11:23	Pass	0.0	NM	NM	NM	824	652	5 min	11:29	-27.84	-28.61	11/13/18	11:34	-1.72	-1.73	-1.00
HH-04_20181115	11/13/2018	12:13	200	12:18	Pass	0	NM	NM	NM	2157	1051	5 min	12:25	-28.17	-29.09	11/13/18	12:32	-5.17	-4.69	-4.20
HH-04_20181115-FD										2162					-28.47				-4.60	-4.10
HH-05_20181115	11/13/2018	14:14	200	14:19	Pass	NM	NM	NM	NM	2175	653	5 min	14:28	-28.29	-29.17	11/13/18	14:33	-2.71	-2.69	-2.00
HH-06_20181115	11/13/2018	15:11	200	15:16	Pass	0	NM	NM	NM	848	668	5 min	15:19	-27.87	-28.42	11/13/18	15:24	-2.28	-2.24	-1.70
HH-07_20181115	11/13/2018	15:58	200	16:03	Pass	NM	NM	NM	NM	2532	666	5 min	16:09	-30.78	-29.13	11/13/18	16:14	-3.83	-1.30	-0.63

Notes:
ID = identification
mL/min = milliliters per minute
NM - not measured; purged gas was not measured with the multirae if there was insufficient volume of gas remaining after helium check.
%v = percent by volume
"Hg = inches of mercury
hr = hour
[1] = the subslab soil gas probes are Cox Colvin brand Vapor Pins and are leak tested with helium

Table 3. Subslab Soil Gas Sampling Log—Winter 2018/2019 Interim Offsite Vapor Intrusion Investigation
Johnson Machine & Fibre Products
142 Hopkins Avenue
Essex-Hope Site, Jamestown, New York

Field ID	Purge and Sample Start Date	Purge Start Time	Purge Rate (mL/min)	Purge End Time	Helium Leak Check[1] (pass/fail)	Total VOCs in Purged Gas (ppm)	MultiRae from Purged Gas (%v)			Canister ID	Flow Controller ID	Flow Controller Rate	Sample Start Time	Initial Canister Pressure ("Hg)		Sample End Date	Sample End Time	Final Pressure ("Hg)		Lab Receipt Pressure ("Hg)
							Oxygen	Carbon Dioxide	H2S					On Can	Digital Gauge			On Can	Digital Gauge	
JMF-01_20181114	11/14/2018	19:36	200	19:41	Pass	0.2	19.2	NM	NM	2499	0523	5 min	19:46	-28.71	-28.67	11/14/18	19:53	-4.82	-5.01	-4.9
JMF-01_20181114-FD										2529					-28.68				-4.88	-4.7
JMF-02_20181114	11/14/2018	16:45	200	16:50	Pass	0.1	NM	NM	NM	1502	654	5 min	16:58	-28.05	-28.41	11/14/18	17:03	-2.05	-1.67	-1.5
JMF-03_20181114	11/14/2018	17:52	200	17:57	Pass	0.2	16.6	NM	NM	2557	688	5 min	19:04	-29.17	-28.64	11/14/18	19:09	-3.30	-2.83	-2.8
JMF-04_20181114	11/14/2018	17:22	200	17:27	Pass	0.1	NM	NM	NM	716	0991	5 min	17:32	-28.58	-28.78	11/14/18	17:37	-2.06	-2.03	-2.3

Notes:
ID = identification

Table 4. Exterior Soil Vapor Sampling Log—Winter 2018/2019 Interim Offsite Vapor Intrusion Investigation
Essex-Hope Site, Jamestown, New York

Field ID	Purge and Sample Start Date	Purge Start Time	Purge Rate (mL/min)	Purge End Time	Helium Leak Check[1] (pass/fail)	Total VOCs in Purged Gas (ppm)	MultiRae from Purged Gas (%v)			Canister ID	Flow Controller ID	Flow Controller Rate	Sample Start Time	Initial Canister Pressure ("Hg)		Sample End Date	Sample End Time	Final Pressure ("Hg)		Lab Receipt Pressure ("Hg)
							Oxygen	Carbon Dioxide	H2S					On Can	Digital Gauge			On Can	Digital Gauge	
SV-01_20181211	12/11/2018	17:11	200	17:16	Pass	0.0	19.8	0	0	2396	0211	5 min	17:24	-28.86	-29.20	12/11/18	17:34	-3.65	-3.81	-2.40
SV-02_20181211	12/11/2018	15:49	200	15:54	Pass	0.0	20.2	0	0	803	0146	5 min	16:00	-28.56	-28.46	12/11/18	16:05	-2.81	-2.61	-1.30
SV-03_20181211	12/11/2018	15:06	200	15:11	Pass	0.0	20.2	0	0	683	0314	5 min	15:18	-28.27	-28.59	12/11/18	15:18	-3.54	-3.56	-2.40
SV-04_20181212	12/12/2018	9:19	200	9:24	Pass	0.0	20.9	0	0	567	0355	5 min	9:28	-28.55	-28.68	12/12/18	9:33	-2.89	-2.99	-1.80
SV-05_20181212	12/12/2018	10:37	200	10:42	Pass	0.0	19.9	0	0	872	0756	5 min	10:54	-28.51	-29.08	12/12/18	10:59	-2.53	-2.55	-1.50
SV-06_20181212	12/12/2018	9:55	200	10:00	Pass	0.0	20.5	0	0	2089	0126	5 min	10:04	-27.93	-28.83	12/12/18	10:07	-2.04	-2.30	-1.00
SV-07_20181212	12/12/2018	13:03	200	13:08	Pass	0.0	20.6	0	0	2163	0594	5 min	13:11	-28.35	-29.31	12/12/18	13:21	-3.29	-3.35	-2.20
SV-07_20181212-FD										2406		5 min			-29.08				-3.41	-2.20
SV-08_20181212	12/12/2018	14:23	200	14:28	Pass	0.0	20.9	0	0	2168	1010	5 min	14:32	-28.44	-29.07	12/12/18	14:37	-2.41	-2.36	-1.40
SV-09_20181212	12/12/2018	13:45	200	13:50	Pass	0.1	19.9	0	0	855	0377	5 min	13:54	-28.78	-29.00	12/12/18	13:59	-2.6	-2.27	-1.30
SV-10_20181213	12/13/2018	12:01	200	12:06	Pass	0.1	19.3	0	0	702	0546	5 min	12:09	-28.42	-28.95	12/13/18	12:17	-3.24	-3.22	-2.40
SV-10_20181213-FD			200		Pass					675		5 min			-28.85				-3.14	-2.30
SV-11_20181212	12/12/2018	14:58	200	15:03	Pass	0	NM	NM	NM	1918	0677	5 min	15:08	-28.10	-28.94	12/12/18	15:13	-1.66	-1.64	-0.59
SV-12_20181212	12/12/2018	15:36	200	15:41	Pass	0	NM	NM	NM	681	0934	5 min	15:45	-28.57	-28.79	12/12/18	15:50	-2.19	-2.07	-1.00
SV-13_20181212	12/12/2018	16:11	200	16:16	Pass	0.1	NM	NM	NM	886	0378	5 min	16:28	-28.05	-29.00	12/12/18	16:33	-2.31	-2.39	-1.20
SV-14_20181213	12/13/2018	10:17	200	10:22	Pass	0	20.9	0	0	1914	0224	5 min	10:26	-28.82	-29.00	12/13/18	10:31	-2.04	-1.77	-0.90
SV-15_20181213	12/13/2018	11:23	200	11:28	Pass	0	20.9	0	0	2404	0407	5 min	11:32	-28.17	-29.02	12/13/18	11:37	-3.34	-3.29	-2.50
SV-16_20181213	12/13/2018	10:49	200	10:54	Pass	0.1	20.4	0	0	2467	01123	5 min	10:59	-28.54	-29	12/13/18	11:04	-2.45	-2.47	-1.70

Notes:
ID = identification
mL/min = milliliters per minute
NM - not measured; purged gas was not measured with the multirae if there was insufficent volume of gas remaining after helium check.
%v = percent by volume
"Hg = inches of mercury
hr = hour
[1] = the subslab soil gas probes are Cox Colvin brand Vapor Pins and are leak tested in accordance with the Cox Colvin helium leak check test method

Table 5. Preferential Pathway Analytical Data—Winter 2018/2019 Interim Offsite Vapor Intrusion Investigation

Offsite Vapor Intrusion Investigation

Essex-Hope Site, Jamestown, New York

				WMS-SE-01		WMS-SE-02		WMS-SE-03		WMS-SE-04		WMS-SE-05		WMS-SE-06	
			Location Description	Storm sewer along Hopkins Ave, outside of Jamestown Machine		Sewer manhole in middle of Hopkins Ave, across from Jamestown Machine		Storm sewer on the corner of Hopkins Ave and Minsker Street		Sewer manhole in the middle of Hopkins Ave, intersection of Minsker Street		Storm sewer on Bigelow Street		Sewer manhole in middle of Bigelow Street	
			Sampler ID	1820-AN-R-085		1820-AN-R-084		1820-AN-R-081		1820-AN-R-086		1820-AN-R-082		1820-AN-R-087	
			Sample Deployment Date	11/12/2018		11/12/2018		11/12/2018		11/12/2018		11/12/2018		11/12/2018	
			Sample Retrieval Date	11/16/2018		11/16/2018		11/16/2018		11/16/2018		11/16/2018		11/16/2018	
				Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Cas #	Parameter Name	EPA Soil Vapor VISL	Units												
75-01-4	Vinyl Chloride	0.93	µg/m^3	30	U	30	U	31	U	31	U	31	U	31	U
75-35-4	1,1-Dichloroethene	29,000	µg/m^3	26	U	26	U	26	U	26	U	26	U	26	U
156-60-5	trans-1,2,-Dichloroethene	--	µg/m^3	11	U	11	U	11	U	12	U	12	U	12	U
156-59-2	cis-1,2-Dichloroethene	--	µg/m^3	4.8	U	**140**		4.8	U	**25**		4.9	U	4.9	U
79-01-6	Trichloroethene	100	µg/m^3	3.5	U	**94**		3.5	U	**26**		3.6	U	3.6	U
127-18-4	Tetrachloroethene	1,600	µg/m^3	2.3	U	**0.94**	J	2.4	U	2.4	U	2.4	U	2.4	U

Notes:

µg/m^3 = micrograms per cubic meter

Qual = Laboratory data qualifier

J = estimated value

U = not detected at the reporting limit

EPA Soil Vapor VISL: USEPA Commercial Soil Vapor Intrusion Screening Level, November, 2018

Bold results indicate detection of chemical above the detection limit.

Table 6. Subslab Analytical Results Table—Winter 2018/2019 Interim Offsite Vapor Intrusion Investigation
H&H Metal Specialty, Inc.
153 Hopkins Avenue
Essex-Hope Site, Jamestown, New York

						Location	HH-01		HH-02		HH-03		HH-04		HH-04		HH-05		HH-06		HH-07	
						Field Sample ID	HH-01-20181115		HH-02-20181115		HH-03-20181115		HH-04-20181115		HH-04-20181115-FD		HH-05-20181115		HH-06-20181115		HH-07-20181115	
						Sample Date	11/15/2018		11/15/2018		11/15/2018		11/15/2018				11/15/2018		11/15/2018		11/15/2018	
						Units	µg/m^3		µg/m^3		µg/m^3		µg/m^3		µg/m^3		µg/m^3		µg/m^3		µg/m^3	
		Sub-Slab Soil Vapor Screening Levels																				
Cas #	Parameter Name	NY-SSC-A	NY-SSC-B	NY-SSC-C	EPA VISL																	
75-01-4	Vinyl chloride			6	0.93	1.14	U	1.12	U	1.1	U	1.24	U	1.23	U	1.15	U	2.28	U	1.08	U
75-35-4	1,1-Dichloroethene	6			29,000	1.77	U	1.73	U	1.71	U	1.93	U	1.9	U	1.78	U	3.53	U	1.68	U
156-60-5	trans-1,2-Dichloroethene				NA	1.77	U	1.73	U	1.71	U	1.93	U	1.9	U	1.78	U	3.53	U	1.68	U
156-59-2	cis-1,2-Dichloroethene	6			NA	**11.8**		**6.9**		**7.33**		4.96		4.64		2.2		**26**		**6.98**	
79-01-6	Trichloroethene	6			100	**33**		**16.7**		**23.1**		**14.5**		**14**		**17**		**1320**		**473**	
127-18-4	Tetrachloroethene		100		1,600	24.4		43.5		2.93	U	**102**		**101**		31.3		9.9		4.58	

Notes:
NY-SSC-A: N Shaded and bold indicates the value is greater than or equal to either the USEPA VISL or the NEW York DOH Sub-slab Vapor Concentrations Criteria
NY-SSC-B: New York DOH Matrix B Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.
NY-SSC-C: New York DOH Matrix C Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.
EPA VISL: EPA Commercial Sub-slab Vapor Intrusion Screening Level, November, 2018
Exceeds NY-SSC, but indoor air data is required to determine if any further action is needed per the matrix.
Exceeds EPA Sub-slab Vapor Intrusion Screening Level
µg/m^3 = micrograms per cubic meter

Table 7. Subslab Soil Gas Analytical Data—Winter 2018/2019 Interim Offsite Vapor Intrusion Investigation
Johnson Machine & Fibre Products
142 Hopkins Avenue
Essex-Hope Site, Jamestown, New York

					Location	JMF-01				JMF-02		JMF-03		JMF-04	
					Field Sample ID	JMF-01_20181114		JMF-01_20181114-FD		JMF-02_20181114		JMF-03_20181114		JMF-04_20181114	
					Sample Date	11/15/2018				11/15/2018		11/15/2018		11/15/2018	
					Units	µg/m^3				µg/m^3		µg/m^3		µg/m^3	
		Sub-Slab Soil Vapor Screening Levels													
Cas #	Parameter Name	NY-SSC-A	NY-SSC-B	NY-SSC-C	EPA VISL										
75-01-4	Vinyl chloride			6	0.93	1.27	U	1.26	U	1.1	U	1.17	U	1.16	U
75-35-4	1,1-Dichloroethene	6			29,000	1.97	U	1.95	U	1.71	U	1.82	U	1.8	U
156-60-5	trans-1,2-Dichloroethene				NA	1.97	U	1.95	U	1.71	U	1.82	U	1.8	U
156-59-2	cis-1,2-Dichloroethene	6			NA	**6.78**		**6.22**		4.4		**11.2**		**8.45**	
79-01-6	Trichloroethene	6			100	**17.8**		**17.5**		**13**		**23.1**		**21.5**	
127-18-4	Tetrachloroethene		100		1,600	10.4		9.9		2.93	U	8.68		14.9	

Notes:
NY-SSC-A: New York DOH Matrix A Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.
NY-SSC-B: New York DOH Matrix B Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.
NY-SSC-C: New York DOH Matrix C Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, and updated May 2017.
EPA VISL: EPA Commercial Subslab Vapor Intrusion Screening Level, November, 2018
Exceeds NY-SSC, but indoor air data is required to determine if any further action is needed per the matrix.
Exceeds EPA Subslab Vapor Intrusion Screening Level
µg/m^3 = micrograms per cubic meter

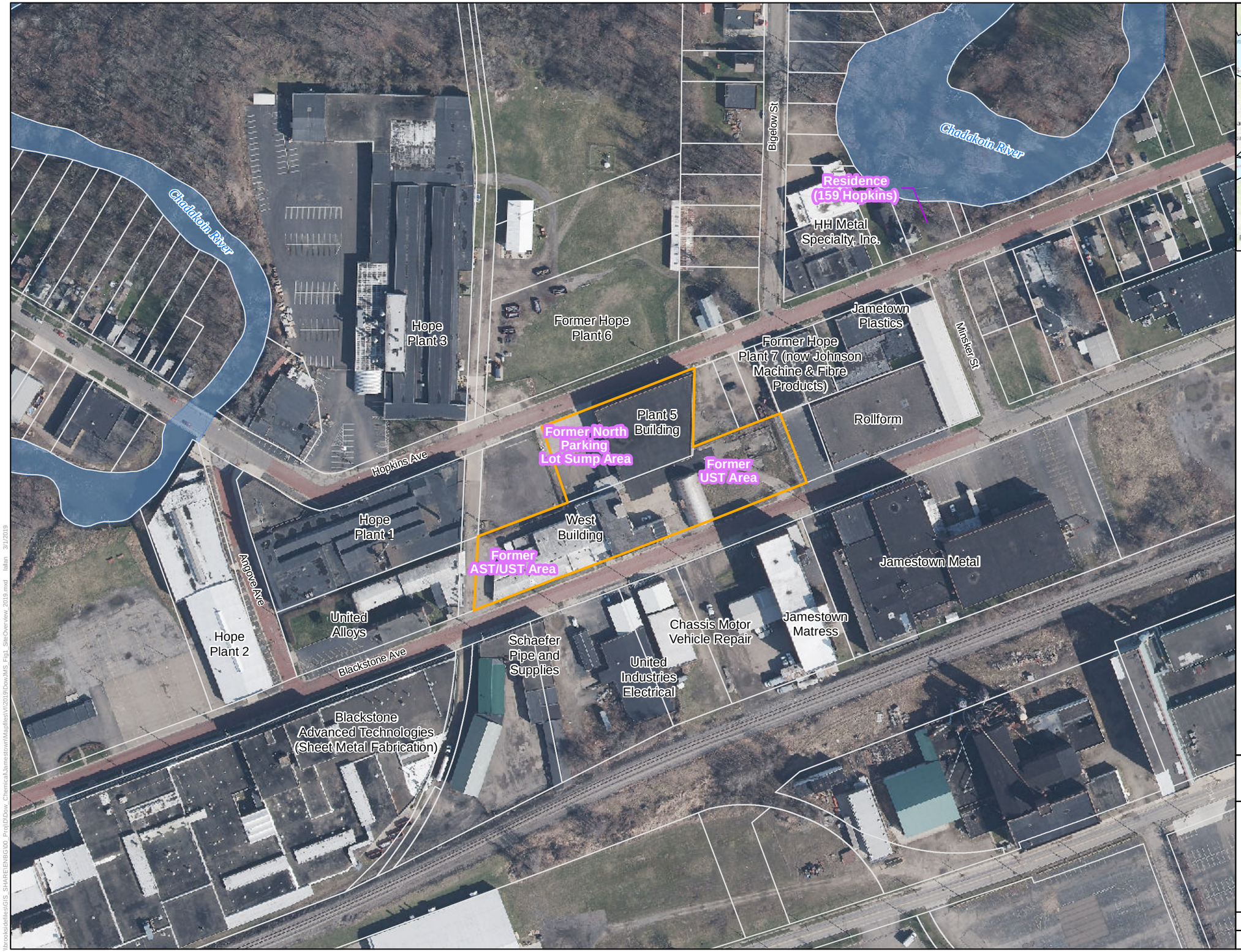
Table 8. Exterior Soil Vapor Probe Analytical Data—Winter 2018/2019 Interim Offsite Vapor Intrusion Investigation
Interim Offsite Vapor Intrusion Investigation
Essex-Hope Site, Jamestown, New York

		Location	SV-01		SV-02		SV-03		SV-04		SV-05		SV-06		SV-07			
		Field Sample ID	SV-01_20181211		SV-02_20181211		SV-03_20181211		SV-04_20181212		SV-05_20181212		SV-06_20181212		SV-07_20181212		SV-07_20181212-FD	
		Sample Date	12/11/2018		12/11/2018		12/11/2018		12/12/2018		12/12/2018		12/12/2018		12/12/2018			
		Units	µg/m³		µg/m³		µg/m³		µg/m³		µg/m³		µg/m³		µg/m³			
Cas #	Parameter Name	EPA Soil Vapor VISL																
75-01-4	Vinyl chloride	0.93	ND		ND		ND		ND		ND		ND		**2.24**	J	ND	
75-35-4	1,1-Dichloroethene	29,000	ND		ND		ND		ND		ND		**2.53**		ND		ND	
156-60-5	trans-1,2-Dichloroethene	NA	ND		ND		ND		ND		ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	NA	ND		ND		ND		ND		ND		ND		**5.71**	J	**3.68**	J
79-01-6	Trichloroethene	100	**262**		ND		ND		**3.27**		ND		**44.1**		**18.3**	J	**7.79**	J
127-18-4	Tetrachloroethene	1,600	**16.2**		**15.7**		**390**		ND		**16.3**		**7.05**		ND		**8.88**	J

		Location	SV-08		SV-09		SV-10				SV-11		SV-12		SV-13		SV-14		SV-15		SV-16	
		Field Sample ID	SV-08_20181212		SV-09_20181212		SV-10_20181213		SV-10_20181213-FD		SV-11_20181212		SV-12_20181212		SV-13_20181212		SV-14_20181213		SV-15_20181213		SV-16_20181213	
		Sample Date	12/12/2018		12/12/2018		12/13/2018				12/12/2018		12/12/2018		12/12/2018		12/13/2018		12/13/2018		12/13/2018	
		Units	µg/m³		µg/m³		µg/m³				µg/m³		µg/m³		µg/m³		µg/m³		µg/m³		µg/m³	
Cas #	Parameter Name	EPA Soil Vapor VISL																				
75-01-4	Vinyl chloride	0.93	ND		ND		**3.02**	J	**6.03**	J	ND		ND		ND		ND		ND		ND	
75-35-4	1,1-Dichloroethene	29,000	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
156-60-5	trans-1,2-Dichloroethene	NA	ND		ND		ND		ND		ND		ND		ND		ND		ND		ND	
156-59-2	cis-1,2-Dichloroethene	NA	ND		ND		**4.76**	J	**8.76**	J	ND		**1.72**		ND		**2.27**		**2.20**		**2.67**	
79-01-6	Trichloroethene	100	**2.71**		**8.81**		**5.75**	J	**10.5**	J	**4.77**		**6.45**		ND		**4.74**		ND		**111**	
127-18-4	Tetrachloroethene	1,600	ND		**3.57**		ND		**35.3**	J	ND		ND		ND		ND		ND		**6.63**	

Notes:
262 Exceeds EPA Vapor Intrusion Screening Level (for soil vapor)
USEPA Soil Vapor VISL: USEPA Vapor Intrusion Screening Level, November, 2018
Bold results indicate detection of chemical above the detection limit.
µg/m3 = micrograms per cubic meter
ND = not detected
EPA = U.S. Environmental Protection Agency

Figures





Site Boundary

Chautauqua County Tax Parcels

Chadakoin River

N

BASE MAP SOURCE:
Imagery: Statewide Digitial Orthoimagery 2012 of Chautauqua County, New York Stat Gov 2012; Tax Parcel Source: Chautauqua County Department of Information Services. Last updated July 7th, 2017.

0 50 100 200

Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 1
Site Location and Layout Map
Interim Off-site Intrusion Investigation

CREATED BY: LA	JACOBS
REVIEWED BY: MV	

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MW-15S	
Analytes	**2017**
Vinyl chloride	1.0 UJ
cis-1,2-Dichloroethene	**1.0 J**
Trichloroethene	**5.6**
Tetrachloroethene	ND

DPT-012 (11-15' bgs)	
Analytes	**2017**
Vinyl chloride	1.0 U
cis-1,2-Dichloroethene	2.5 U
Trichloroethene	**6.0 J**
Tetrachloroethene	ND

MW-104S		
Analytes	**2018**	**2017**
Vinyl chloride	ND	1.0 UJ
cis-1,2-Dichloroethene	ND	**1.0 J**
Trichloroethene	**100**	**130**
Tetrachloroethene	**0.26 J**	ND

DPT-011 (11-15' bgs)	
Analytes	**2017**
Vinyl chloride	1.0 U
cis-1,2-Dichloroethene	**11**
Trichloroethene	**21 J**
Tetrachloroethene	ND

MW-108S				
Analytes	**2018**		**2017**	
Vinyl chloride	ND	ND	1.0 U	1.0 U
cis-1,2-Dichloroethene	**5.8**	**5.8**	**4.6**	**4.6**
Trichloroethene	**28**	**28**	**22**	**22**
Tetrachloroethene	**0.31 J**	**0.33 J**	**0.48 J**	**0.48 J**

MW-7S	
Analytes	**2017**
Vinyl chloride	1.0 UJ
cis-1,2-Dichloroethene	**14**
Trichloroethene	**7.1**
Tetrachloroethene	ND

MW-106S	
Analytes	**2017**
Vinyl chloride	**6.4**
cis-1,2-Dichloroethene	**11**
Trichloroethene	**13**
Tetrachloroethene	ND

MW-14S	
Analytes	**2017**
Vinyl chloride	1.0 U
cis-1,2-Dichloroethene	**2.4 J**
Trichloroethene	**14**
Tetrachloroethene	ND

MW-103S	
Analytes	**2017**
Vinyl chloride	**0.17 J**
cis-1,2-Dichloroethene	**70**
Trichloroethene	**180**
Tetrachloroethene	ND

RW-2S		
Analytes	**2018**	**2017**
Vinyl chloride	**0.84 J**	**2**
cis-1,2-Dichloroethene	**24**	**31**
Trichloroethene	**35**	**14**
Tetrachloroethene	ND	ND

MW-25S	
Analytes	**2017**
Vinyl chloride	1.0 U
cis-1,2-Dichloroethene	**21**
Trichloroethene	**82**
Tetrachloroethene	ND

MW-18S	
Analytes	**2017**
Vinyl chloride	**0.34 J**
cis-1,2-Dichloroethene	**65**
Trichloroethene	**190**
Tetrachloroethene	ND

RW-1S		
Analytes	**2018**	**2017**
Vinyl chloride	**14**	**6**
cis-1,2-Dichloroethene	**360**	**91**
Trichloroethene	**260**	**26**
Tetrachloroethene	ND	ND

MW-102S		
Analytes	**2017**	**Dup**
Vinyl chloride	**0.16 J**	**0.15 J**
cis-1,2-Dichloroethene	**44**	**45**
Trichloroethene	**30**	**30**
Tetrachloroethene	ND	ND

GP-1S	
Analytes	**2017**
Vinyl chloride	**0.33 J**
cis-1,2-Dichloroethene	**16**
Trichloroethene	**18**
Tetrachloroethene	ND

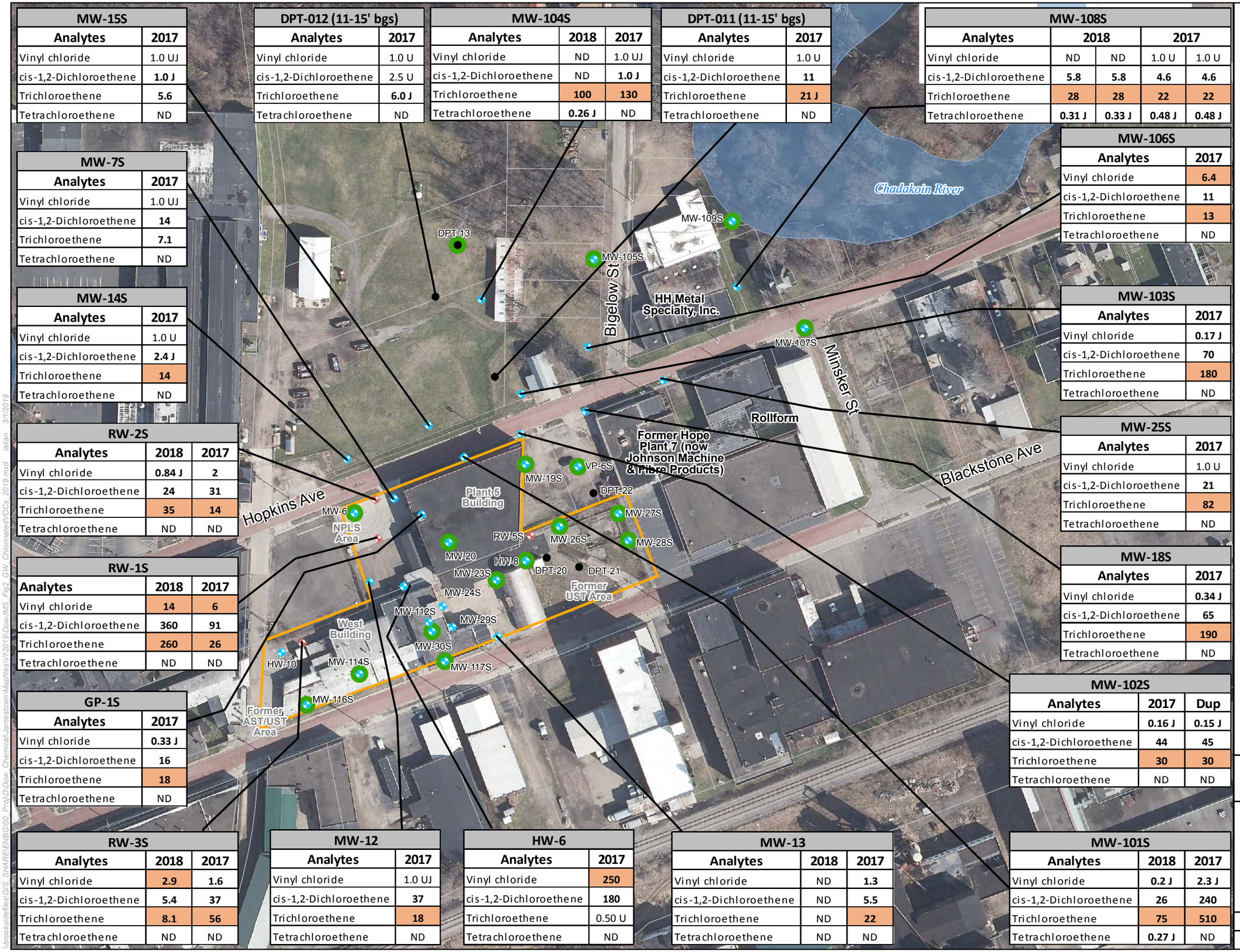
RW-3S		
Analytes	**2018**	**2017**
Vinyl chloride	**2.9**	**1.6**
cis-1,2-Dichloroethene	**5.4**	**37**
Trichloroethene	**8.1**	**56**
Tetrachloroethene	ND	ND

MW-12	
Analytes	**2017**
Vinyl chloride	1.0 UJ
cis-1,2-Dichloroethene	**37**
Trichloroethene	**18**
Tetrachloroethene	ND

HW-6	
Analytes	**2017**
Vinyl chloride	**250**
cis-1,2-Dichloroethene	**180**
Trichloroethene	0.50 U
Tetrachloroethene	ND

MW-13		
Analytes	**2018**	**2017**
Vinyl chloride	ND	**1.3**
cis-1,2-Dichloroethene	ND	**5.5**
Trichloroethene	ND	**22**
Tetrachloroethene	ND	ND

MW-101S		
Analytes	**2018**	**2017**
Vinyl chloride	**0.2 J**	**2.3 J**
cis-1,2-Dichloroethene	**26**	**240**
Trichloroethene	**75**	**510**
Tetrachloroethene	**0.27 J**	ND



Approximate Site Boundary

Chadakoin River

Shallow Sampling Points

Monitoring Well

Recovery Well

Direct Push Location

Samping Results

No exceedances of compounds

Parameter Name	USEPA GW VISL (ug/L)
Vinyl chloride	2.5
cis-1,2-Dichloroethene	NA
Trichloroethene	7.4
Tetrachloroethene	65

Notes:
1. Orange highlighted cells: Exceeds the USEPA Groundwater Vapor Intrusion Screening Levels (VISLs).
2. Bold results indicate detection of chemical above the detection limit.
3. Measurements in ug/L.
4. Most recent 2018 and 2017 results depicted (March, Aug, Sept, and Oct 2017, and Nov 2018).

Acronyms and Abbreviations:
; g = Microgram(s)
L = Liter
J = Estimated Value
U = Not Detected

N

BASE MAP SOURCE:

0 25 50 100
Scale in Feet

Essex Specialty Products, Inc

Essex/Hope Site, Jamestown, New York

FIGURE 2
Shallow WBZ Groundwater Results
Chlorinated VOCs
Interim Off-site Vapour Intrusion Investigation

CREATED BY: LA

REVIEWED BY: FR

JACOBS

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Soil Vapor Sample Location

Subslab Vapor Sample Location

Sanitary/Storm Sewer

Approximate Site Boundary

Parcels

Access to Rollform was Denied and therefore sampling has not been proposed at this time

Chadakoin River

N

BASE MAP SOURCE:

0 50 100 200

Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 3
Vapor Intrusion Investigation Locations
Interim Off-site Vapor Intrusion Investigation

CREATED BY: LA	JACOBS
REVIEWED BY: AS	

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WMS-SE-05	
Analytes	**Results**
Vinyl Chloride	ND
1,1-Dichloroethene	ND
trans-1,2,-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	ND

WMS-SE-06	
Analytes	**Results**
Vinyl Chloride	ND
1,1-Dichloroethene	ND
trans-1,2,-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	ND

WMS-SE-02	
Analytes	**Results**
Vinyl Chloride	ND
1,1-Dichloroethene	ND
trans-1,2,-Dichloroethene	ND
cis-1,2-Dichloroethene	**140**
Trichloroethene	**94**
Tetrachloroethene	**0.94 J**

WMS-SE-01	
Analytes	**Results**
Vinyl Chloride	ND
1,1-Dichloroethene	ND
trans-1,2,-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	ND

WMS-SE-04	
Analytes	**Results**
Vinyl Chloride	ND
1,1-Dichloroethene	ND
trans-1,2,-Dichloroethene	ND
cis-1,2-Dichloroethene	**25**
Trichloroethene	**26**
Tetrachloroethene	ND

WMS-SE-03	
Analytes	**Results**
Vinyl Chloride	ND
1,1-Dichloroethene	ND
trans-1,2,-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	ND

Bigelow St

Chadakoin River

HH Metal Specialty, Inc.

159 Hopkins Avenue Residence

Minsker St

Rollform

Former Hope Plant 6

Former Hope Plant 7 (now Johnson Machine & Fibre Products)

Plant 5 Building

NPLS Area

Treatment Building

Former UST Area

SV-01 SV-02 SV-03 SV-04 SV-05 SV-06 SV-07 SV-08 SV-09 SV-10 SV-11 SV-12 SV-13 SV-14 SV-15 SV-16

HH-01 HH-02 HH-03 HH-04 HH-05 HH-06 HH-07

JMF-01 JMF-02 JMF-03 JMF-04

Sanitary Sewer Location
Storm Sewer Location
Soil Vapor Sample Location
Subslab Vapor Sample Location
Sanitary/Storm Sewer
Approximate Site Boundary
Parcels
Access to Rollform was Denied and therefore sampling has not been proposed at this time
Chadakoin River

Notes:
1. Yellow highlighted cells: Exceeds NYSDEC, but indoor air data is required to determine if any further action is needed per the matrix.
2. Red text within cells: Exceeds USEPA Subslab Vapor Intrusion Screening Level
3. Bold results indicate detection of chemical above detection limit.
4. Measurements in Bg/L (micrograms/liter).

N

BASE MAP SOURCE:

0 25 50 100
Scale in Feet

Essex Specialty Products, Inc

Essex/Hope Site, Jamestown, New York

FIGURE 4
Passive Sampler in Sewer Data
November 2018
Investigation Locations
Interim Off-site Vapor Intrusion Investigation

CREATED BY: LA

REVIEWED BY: AS

JACOBS

3/6/2019

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HH-01	
Analytes	
Vinyl chloride	1.14 U
1,1-Dichloroethene	1.77 U
trans-1,2-Dichloroethene	1.77 U
cis-1,2-Dichloroethene	**11.8**
Trichloroethene	**33**
Tetrachloroethene	24.4

HH-02	
Analytes	
Vinyl chloride	1.12 U
1,1-Dichloroethene	1.73 U
trans-1,2-Dichloroethene	1.73 U
cis-1,2-Dichloroethene	**6.9**
Trichloroethene	**16.7**
Tetrachloroethene	43.5

HH-03	
Analytes	
Vinyl chloride	1.1 U
1,1-Dichloroethene	1.71 U
trans-1,2-Dichloroethene	1.71 U
cis-1,2-Dichloroethene	**7.33**
Trichloroethene	**23.1**
Tetrachloroethene	2.93 U

HH-04		
Analytes		Duplicate
Vinyl chloride	1.24 U	1.23 U
1,1-Dichloroethene	1.93 U	1.9 U
trans-1,2-Dichloroethene	1.93 U	1.9 U
cis-1,2-Dichloroethene	4.96	4.64
Trichloroethene	**14.5**	**14**
Tetrachloroethene	**102**	**101**

HH-05	
Analytes	
Vinyl chloride	1.15 U
1,1-Dichloroethene	1.78 U
trans-1,2-Dichloroethene	1.78 U
cis-1,2-Dichloroethene	2.2
Trichloroethene	**17**
Tetrachloroethene	31.3

HH-06	
Analytes	
Vinyl chloride	2.28 U
1,1-Dichloroethene	3.53 U
trans-1,2-Dichloroethene	3.53 U
cis-1,2-Dichloroethene	**26**
Trichloroethene	**1320**
Tetrachloroethene	9.9

JMF-01		
Analytes		Duplicate
Vinyl chloride	1.27 U	1.26 U
1,1-Dichloroethene	1.97 U	1.95 U
trans-1,2-Dichloroethene	1.97 U	1.95 U
cis-1,2-Dichloroethene	**6.78**	**6.22**
Trichloroethene	**17.8**	**17.5**
Tetrachloroethene	10.4	9.9

HH-07	
Analytes	
Vinyl chloride	1.08 U
1,1-Dichloroethene	1.68 U
trans-1,2-Dichloroethene	1.68 U
cis-1,2-Dichloroethene	**6.98**
Trichloroethene	**473**
Tetrachloroethene	4.58

JMF-02	
Analytes	
Vinyl chloride	1.1 U
1,1-Dichloroethene	1.71 U
trans-1,2-Dichloroethene	1.71 U
cis-1,2-Dichloroethene	4.4
Trichloroethene	**13**
Tetrachloroethene	2.93 U

JMF-04	
Analytes	
Vinyl chloride	1.16 U
1,1-Dichloroethene	1.8 U
trans-1,2-Dichloroethene	1.8 U
cis-1,2-Dichloroethene	**8.45**
Trichloroethene	**21.5**
Tetrachloroethene	14.9

JMF-03	
Analytes	
Vinyl chloride	1.17 U
1,1-Dichloroethene	1.82 U
trans-1,2-Dichloroethene	1.82 U
cis-1,2-Dichloroethene	**11.2**
Trichloroethene	**23.1**
Tetrachloroethene	8.68

Soil Vapor Sample Location
Subslab Vapor Sample Location
Sanitary/Storm Sewer
Approximate Site Boundary
Parcels
Access to Rollform was Denied and therefore sampling has not been proposed at this time
Chadakoin River

Notes:
1. Orange highlighted cells: Exceeds NY-SSC, but indoor air data is required to determine if any further action is needed per the matrix.
2. Red text within cells: Exceeds USEPA Sub-slab Vapor Intrusion Screening Level
3. Bold results indicate detection of chemical above detection limit.

N

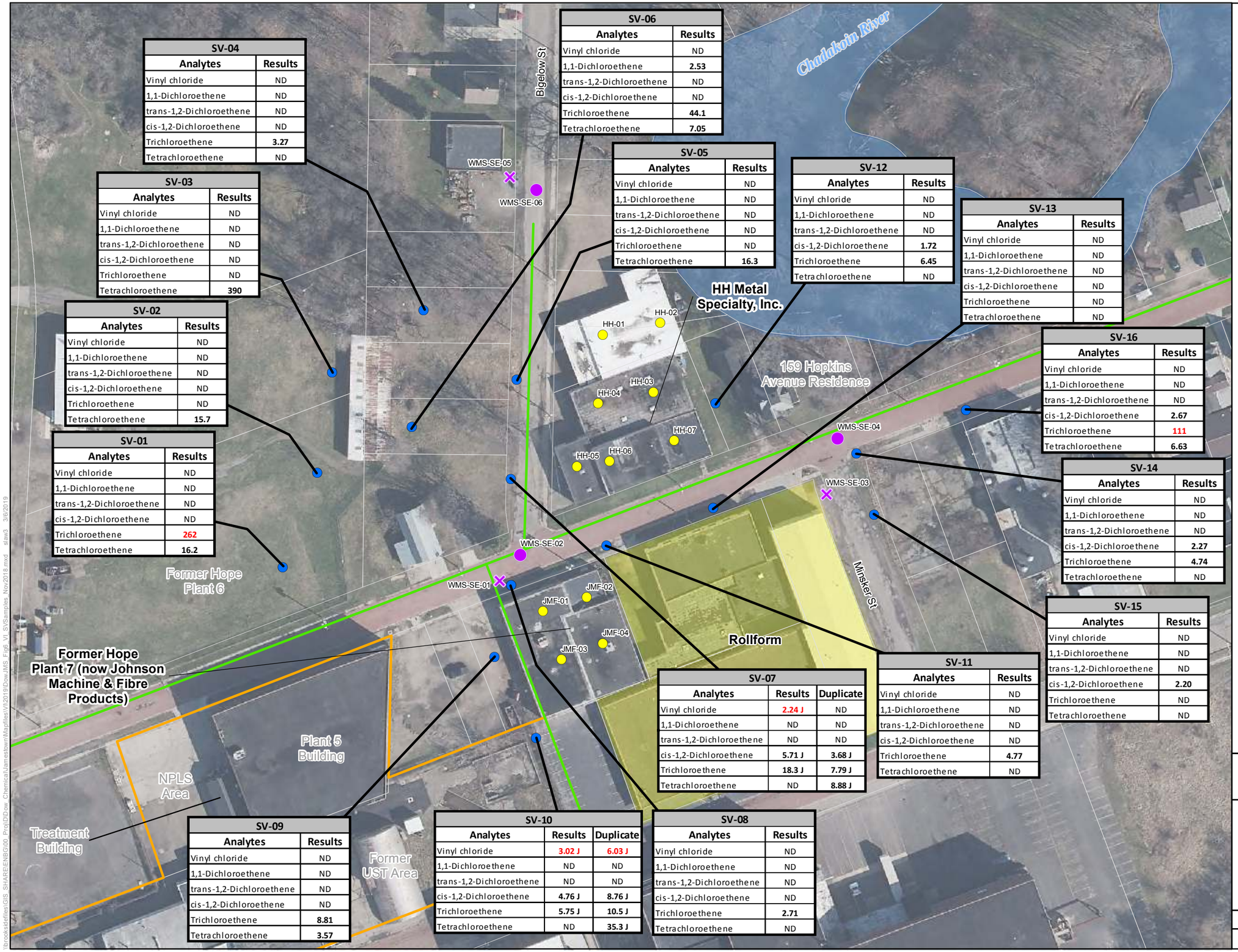
0 50 100 200
Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 5
Sub-Slab Analytical Results
November 2018
Investigation Locations
Interim Off-site Vapor Intrusion Investigation

CREATED BY: LA	JACOBS
REVIEWED BY: AS	

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SV-04	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	**3.27**
Tetrachloroethene	ND

SV-03	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	**390**

SV-02	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	**15.7**

SV-01	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	**262**
Tetrachloroethene	**16.2**

SV-06	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	**2.53**
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	**44.1**
Tetrachloroethene	**7.05**

SV-05	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	**16.3**

SV-12	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	**1.72**
Trichloroethene	**6.45**
Tetrachloroethene	ND

SV-13	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	ND
Tetrachloroethene	ND

SV-16	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	**2.67**
Trichloroethene	**111**
Tetrachloroethene	**6.63**

SV-14	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	**2.27**
Trichloroethene	**4.74**
Tetrachloroethene	ND

SV-15	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	**2.20**
Trichloroethene	ND
Tetrachloroethene	ND

SV-11	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	**4.77**
Tetrachloroethene	ND

SV-07		
Analytes	**Results**	**Duplicate**
Vinyl chloride	**2.24 J**	ND
1,1-Dichloroethene	ND	ND
trans-1,2-Dichloroethene	ND	ND
cis-1,2-Dichloroethene	**5.71 J**	**3.68 J**
Trichloroethene	**18.3 J**	**7.79 J**
Tetrachloroethene	ND	**8.88 J**

SV-10		
Analytes	**Results**	**Duplicate**
Vinyl chloride	**3.02 J**	**6.03 J**
1,1-Dichloroethene	ND	ND
trans-1,2-Dichloroethene	ND	ND
cis-1,2-Dichloroethene	**4.76 J**	**8.76 J**
Trichloroethene	**5.75 J**	**10.5 J**
Tetrachloroethene	ND	**35.3 J**

SV-09	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	**8.81**
Tetrachloroethene	**3.57**

SV-08	
Analytes	**Results**
Vinyl chloride	ND
1,1-Dichloroethene	ND
trans-1,2-Dichloroethene	ND
cis-1,2-Dichloroethene	ND
Trichloroethene	**2.71**
Tetrachloroethene	ND

- Sanitary Sewer Location
- Storm Sewer Location
- Soil Vapor Sample Location
- Subslab Vapor Sample Location
- Sanitary/Storm Sewer
- Approximate Site Boundary
- Parcels
- Access to Rollform was Denied and therefore sampling has not been proposed at this time
- Chadakoin River

Notes:
1. Red text within cells: exceeds USEPA exterior soil vapor intrusion screening levels.
2. Bold results indicate detection of chemical above the detection limit.

N

0 25 50 100
Scale in Feet

Essex Specialty Products, Inc

Essex/Hope Site, Jamestown, New York

FIGURE 6
Exterior Soil IGas Analytical Results
Interim Off-Site Vapor Intrusion Investigation

CREATED BY: LA
REVIEWED BY: AS

JACOBS

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Appendix A
Building Surveys

H+H METAL

OSR – 3

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name M. VIDAL + JON GOWING Date/Time Prepared 4/27/2018

Preparer's Affiliation CH2M - JACOBS Phone No. 978-427-1801

Purpose of Investigation 2018 VI INVESTIGATION

1. OCCUPANT: H+H METAL SPECIALTY INC.

Interviewed: (Y) N

Last Name: CECI First Name: BRIAN

Address: 153 HOPKINS AVENUE, JAMESTOWN NY 14701

County: CHAUTAUQUA

Home Phone: N/A Office Phone: 716-665-2110

Number of ~~Occupants/persons~~ at this location 2-3 Age of Occupants 40-60
EMPLOYEES

2. OWNER OR LANDLORD: (Check if same as occupant ___)

Interviewed: Y (N)

Last Name: HARRIS First Name: SUSAN

Address: N/A - AT NURSING HOME

County: N/A

Home Phone: N/A Office Phone: N/A

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
(Industrial)	Church	Other: ___

If the property is residential, type? (Circle appropriate response) N/A

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? N/A

If the property is commercial, type?

Business Type(s) METAL FABRICATION (WELDING, BRAZING, STAMPING)

Does it include residences (i.e., multi-use)? (Y) N If yes, how many? 1 (VACANT)

Other characteristics:

Number of floors 1 Building age BETWEEN 99 TO 19 YRS (SEE FLOOR PLA

Is the building insulated? (Y) / N How air tight? (Tight) / Average / Not Tight

OFFICE SPACE (NORTH SECTION) ONLY. OTHER SECTIONS ARE NOT INSULATED.

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

N/A - ONE FLOOR ONLY

Airflow near source

NO SOURCE IDENTIFIED. INDOOR AIR IS RE-CIRCULATED BY HVAC SYSTEM AND BLOWER IN THE MANUFACTURING, WELDING AND PRESS ROOM AREAS.

Outdoor air infiltration

POTENTIAL OUTDOOR AIR INFILTRATION FROM WINDOWS/DOORWAYS IN THE NON-INSULATED AREAS; ROOF LEAKS IN WELDING ROOM. FORMER CHIMNEY IS CURRENTLY CAPPED.

Infiltration into air ducts

EXHAUSTS AND UNIT HEATERS STACKS APPEAR TO BE AIR-TIGHT.

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply) - SLAB ON GRADE

a. Above grade construction:	wood frame	(concrete)	stone	brick
b. Basement type: N/A	full	crawlspace	slab	other _____
c. Basement floor: N/A	concrete	dirt	stone	other _____
d. Basement floor: N/A	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	(sealed) BUT HAS CRACKS, UTILITY TRENCHES, BOILER ROOM	sealed with _____	
f. Foundation walls:	poured	(block)	stone	other _____
g. Foundation walls:	unsealed	(sealed)	sealed with _____	
h. The basement is: N/A	wet	damp	dry	moldy
i. The basement is: N/A	finished	unfinished	partially finished	
j. Sump present?	Y (N)			
k. Water in sump?	Y / N / (not applicable)			

* WET + DAMP FLOOR AREAS IN WELDING AND PRESS ROOMS.

Basement/Lowest level depth below grade: 5.5 (feet) FORMER BOILER ROOM (~4' WIDE BY 5' LONG)

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

* FLOOR/CONCRETE CRACKS PRESENT IN WELDING + PRESS ROOMS (~2' TO 10' LONG)
* UTILITY TRENCHES IN PRESS ROOM (~9" DEEP)
* FORMER BOILER ROOM IN PRESS ROOM (~6'W x 5'L x 5.5' D)
* FLOOR DRAINS IN BATHROOMS AND MANUFACTURING AREA.
* TRENCH PIT FOR PRESS FILLED WITH GRAVEL (~5' DEEP)

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

FORCED AIR UNIT HEATER (Hot air circulation)	(Heat pump) → OFFICE AREA ONLY	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

(Natural Gas) → UNIT HEATER	Fuel Oil	Kerosene
(Electric) → HEAT PUMP	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: ELECTRIC (2 HOT WATER TANKS)

FORMER **Boiler/furnace located in:**	Basement	Outdoors	(Main Floor) L 5.5' BELOW GRADE	Other _____
Air conditioning:	(Central Air)	Window units	Open Windows	None

Are there air distribution ducts present? (Y) / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

NOT VISIBLE IN OFFICE, CAFETERIA OR BATHROOMS.
HVAC SYSTEM, BLOWER, STACKS AND UNIT HEATERS APPEAR AIR-TIGHT.

7. OCCUPANCY ~ 2 PEOPLE, 40 HRS/WEEK EACH.

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	N/A
1st Floor	OFFICE + WORKSHOP SPACES, INCLUDING 3 GARAGES.
2nd Floor	N/A
3rd Floor	N/A
4th Floor	N/A

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? (Y) N – 3 TOTAL

b. Does the garage have a separate heating unit? (Y) / N / NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) (Y) N / NA
Please specify TRUCKS, FORK LIFT, LAWN MOWERS

d. Has the building ever had a fire? Y / (N) When? _____

e. Is a kerosene or unvented gas space heater present? Y / (N) Where? _____

f. Is there a workshop or hobby/craft area? (Y) N Where & Type? MAJORITY OF BUILDING, METAL WELDING/FABRICATION

g. Is there smoking in the building? Y / (N) How frequently? _____

h. Have cleaning products been used recently? (Y) N When & Type? WEEKLY SPRAY 9, NICE N' EASY, WINDEX.

i. Have cosmetic products been used recently? Y / (N) When & Type? _____

j. Has painting/staining been done in the last 6 months? (Y) N Where & When? TOUCH-UPS ACROSS BUILDING

k. Is there new carpet, drapes or other textiles? (Y) N Where & When? 1+ YRS AGO

l. Have air fresheners been used recently? (Y) N When & Type? WOMEN'S BATHROOM

m. Is there a kitchen exhaust fan? (Y) N If yes, where vented? RECIRCULATED.

n. Is there a bathroom exhaust fan? (Y) N If yes, where vented? ROOF STACK

o. Is there a clothes dryer? Y (N) If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y (N) When & Type? _____

Are there odors in the building? (Y) N
If yes, please describe: WELDING FUMES, GRINDING DUST, SOLVENTS + LUBRICANTS ODORS

Do any of the building occupants use solvents at work? (Y) N - METAL FABRICATION PROCESS
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? * KENSOL 30 BY BRAD PEN
* L 67 VARNISHING OIL BY PPG
* LUBRICANTS / ADHESIVES / GREASES / METAL PAINTS - COATINGS.

If yes, are their clothes washed at work? Y (N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) (No)
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? (Y) N Date of Installation: BUT OFF SINCE 4/2018 → FOR RESIDENCE ONLY.
DUE TO VACANCY.
Is the system active or passive? (Active)/Passive

9. WATER AND SEWAGE

Water Supply: (Public Water) Drilled Well Driven Well Dug Well Other: _____

Sewage Disposal: (Public Sewer) Septic Tank Leach Field Dry Well Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency) BEING PURCHASED BUT NO CHANGES EXPETED IN USE/OCCUPANCY

a. Provide reasons why relocation is recommended: _____

N/A

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

d. Relocation package provided and explained to residents? Y / N

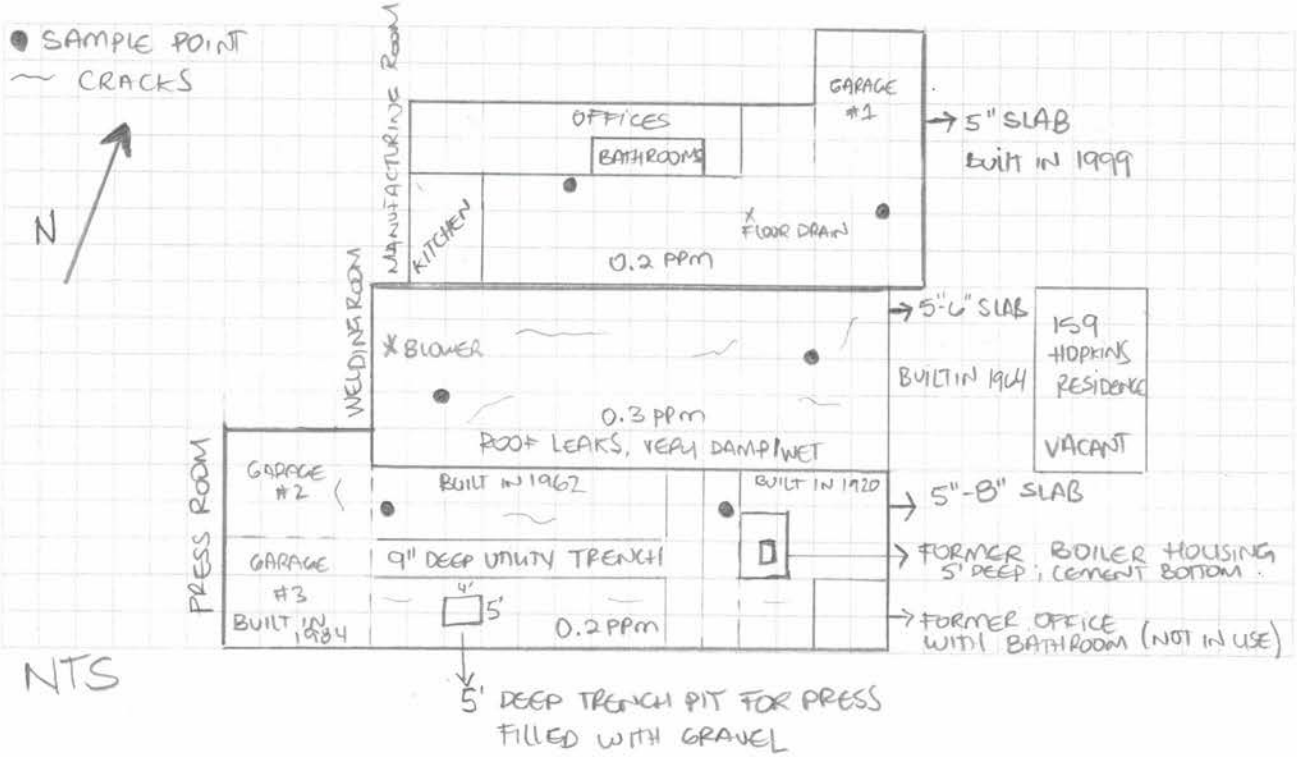
* RESIDENCE TO BE POTENTIALLY DEMOLISHED.

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement: N/A

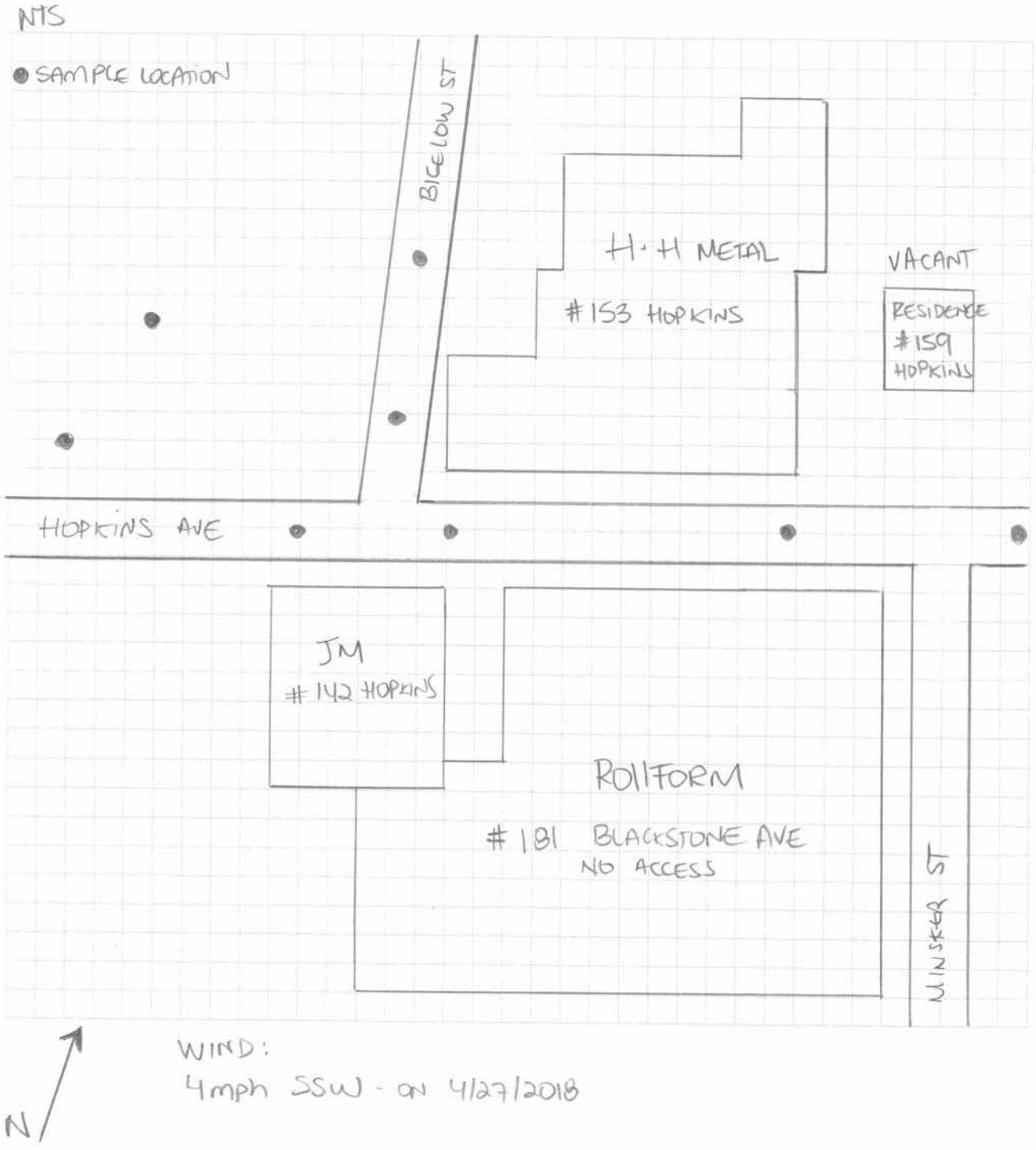
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: MINIRAE 2000 PHOTOIONIZATION DETECTOR (PID)

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units) gallons	Condition*	Chemical Ingredients	Field Instrument Reading (units) PPM	Photo ** Y / N
PRESS ROOM	KENSOL 30	55	U	STODDARD SOLVENT, NONANE, TMB	1.2	N
	L 67	55	U	OIL, RESIN, SOLVENT, DRIERS	0.5	N
	USED HYDRAULIC OIL	55	U	OILS, BUTANOL, ESTERS, ADIPATES	0.5	N
	SOAP GILCITE WAX - PD 17	55	U	DRAWING + STAMPING COMPOUNDS	0.5	N
	MOBIL OIL 600 W	(12)-5gal	U	BASE OIL + ADDITIVES	0.3	N
	TRANSMISSION OIL ATF-4	10gal	U	MINERAL OIL, DISTILLATES + PARAFFINS	0.5	N
	SPRAY NINE HEAVY DUTY	1	U	C9-C10 ALCOHOLS, DYPROPYLENE GYCOL, MONONBUTYL ETHER	0.1	N
	PAINT STRIPPER, CEMENT, PAINT, ANTIFREEZE, MICE +	VARIOUS SIZES	U	VARIOUS INGREDIENTS	0.3	N
WELDING ROOM	USED DRAIN OIL EASY	55	U	* SEE "USED HYDRAULIC OIL"	0.5	N
	KESTER 959T SOLDERING FLUX	VARIOUS gallons	U	ROSIN, PROPANOL, SUCCINIC ACID	0.2	N
	STARTING FLUID	3 SPRAY cans	U	HEPTANE, CO_2, ETHANOL, CHLOROETHANE, DIETHYL ETHER	0.1	N
	RUST TREATMENT	1 SPRAY CAN	U	ACETONE, PETRO GASES, FORMIC ACID, 2-BUTOXYETHANOL	0.1	N
	3M HI-STRENGTH 90 CONTACT ADHESIVE	2 SPRAY CAN	U	DIMETHYL ETHER, METHYL ACETATE CYCLOHEXANE, 1-1-DIFLUOROETHANE	0.1	N
MANUFACTURE ROOM	PROPANE GAS	2 small cylinders	U	PROPANE	0.3	N
	EMCO FINISHING PAINT	1	U	EPOXY RESINS	0.2	N
						N
GARAGES	PROPANE GAS	5 medium cylinders	U	PROPANE	0.3	N
	GASOLINE	1	U	GASOLINE	0.3	N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

OSR – 3

JOHNSON MACHINE

NEW YORK STATE DEPARTMENT OF HEALTH
INDOOR AIR QUALITY QUESTIONNAIRE AND BUILDING INVENTORY
CENTER FOR ENVIRONMENTAL HEALTH

This form must be completed for each residence involved in indoor air testing.

Preparer's Name M. VIDAL + J. GOWDY Date/Time Prepared 4/27/2018

Preparer's Affiliation CH2M - JACOBS Phone No. 978 427 1801

Purpose of Investigation 2018 VI INVESTIGATION

1. OCCUPANT: JOHNSON MACHINE + FIBRE PRODUCTS

Interviewed: (Y)/ N

Last Name: MARSHALL First Name: MICHAEL

Address: 142 HOPKINS AVENUE, JAMESTOWN NY 14701

County: CHAUTAUQUA

Home Phone: N/A Office Phone: 716-665-2003 x 205

Number of Occupants/persons at this location _____ Age of Occupants _____

2. OWNER OR LANDLORD: (Check if same as occupant ✓)

Interviewed: (Y)/ N

Last Name: _____ First Name: _____

Address: _____

County: _____

Home Phone: _____ Office Phone: _____

3. BUILDING CHARACTERISTICS

Type of Building: (Circle appropriate response)

Residential	School	Commercial/Multi-use
(Industrial)	Church	Other: _____

If the property is residential, type? (Circle appropriate response) N/A

Ranch	2-Family	3-Family
Raised Ranch	Split Level	Colonial
Cape Cod	Contemporary	Mobile Home
Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other:_____

If multiple units, how many? N/A

If the property is commercial, type?

Business Type(s) METAL FABRICATION

Does it include residences (i.e., multi-use)? Y / (N) If yes, how many? N/A

Other characteristics:

Number of floors 1 Building age 30 YRS

Is the building insulated? (Y) / N How air tight? Tight / (Average) / Not Tight

L SOME SHALLOW CRACKS

4. AIRFLOW

Use air current tubes or tracer smoke to evaluate airflow patterns and qualitatively describe:

Airflow between floors

N/A - ONE FLOOR ONLY

Airflow near source

NO SOURCE IDENTIFIED. INDOOR AIR IS RECIRCULATED BY HVAC SYSTEM AND BLOWER IN MANUFACTURING AREA.

Outdoor air infiltration

POTENTIAL OUTDOOR AIR INFILTRATION FROM WINDOWS/DOORWAYS.

Infiltration into air ducts

EXPOSED AIR DUCTS APPEAR TO BE AIR-TIGHT

5. BASEMENT AND CONSTRUCTION CHARACTERISTICS (Circle all that apply) 6"-12" SLAB.

a. Above grade construction:	wood frame	(concrete)	stone	(brick)
b. Basement type: N/A	full	crawlspace	slab	other _____
c. Basement floor: N/A	concrete	dirt	stone	other _____
d. Basement floor: N/A	uncovered	covered	covered with _____	
e. Concrete floor:	unsealed	(sealed)	sealed with _____	
f. Foundation walls:	poured	(block)	stone	other _____
g. Foundation walls:	unsealed	(sealed)	sealed with _____	
h. The ~~basement~~ FIRST FLOOR is:	wet	damp	(dry)	moldy
i. The basement is: N/A	finished	unfinished	partially finished	
j. Sump present?	Y (N)			
k. Water in sump?	Y / N / (not applicable)			

Basement/Lowest level depth below grade: 1 (feet) - WHERE SLAB IS THICKEST

Identify potential soil vapor entry points and approximate size (e.g., cracks, utility ports, drains)

* SHALLOW SURFACE CRACKS IN MANUFACTURING AREA (~2'-5' LONG)
* FLOOR DRAINS IN BATHROOMS AND MANUFACTURING AREA.

6. HEATING, VENTING and AIR CONDITIONING (Circle all that apply)

Type of heating system(s) used in this building: (circle all that apply – note primary)

Hot air circulation	(Heat pump)	Hot water baseboard	
Space Heaters	Stream radiation	Radiant floor	
Electric baseboard	Wood stove	Outdoor wood boiler	Other _____

The primary type of fuel used is:

Natural Gas	Fuel Oil	Kerosene
(Electric)	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: ELECTRIC

Boiler/furnace located in: Basement Outdoors Main Floor Other_____

Air conditioning: (Central Air) Window units Open Windows None

Are there air distribution ducts present? (Y) / N

Describe the supply and cold air return ductwork, and its condition where visible, including whether there is a cold air return and the tightness of duct joints. Indicate the locations on the floor plan diagram.

NOT VISIBLE IN OFFICE, KITCHEN OR BATHROOMS.
HVAC SYSTEM, BLOWER AND UNIT HEATERS APPEAR AIR-TIGHT.

7. OCCUPANCY ↱ AT LEAST 2 PEOPLE, 40 HRS/WEEK EACH.

Is basement/lowest level occupied? Full-time Occasionally Seldom Almost Never

Level	**General Use of Each Floor (e.g., familyroom, bedroom, laundry, workshop, storage)**
Basement	N/A
1st Floor	OFFICE + WORKSHOP.
2nd Floor	N/A
3rd Floor	N/A
4th Floor	N/A

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a. Is there an attached garage? (Y) N

b. Does the garage have a separate heating unit? Y (N) NA

c. Are petroleum-powered machines or vehicles stored in the garage (e.g., lawnmower, atv, car) (Y) N / NA Please specify VEHICLES

d. Has the building ever had a fire? Y / (N) When?

e. Is a kerosene or unvented gas space heater present? Y / (N) Where?

f. Is there a workshop or hobby/craft area? (Y) N Where & Type? MAJORITY OF BUILDING METAL FABRICATION

g. Is there smoking in the building? Y / (N) How frequently?

h. Have cleaning products been used recently? (Y) N When & Type? AT LEAST WEEKLY HOUSEHOLD + METAL CLEANING AGENTS.

i. Have cosmetic products been used recently? Y (N) When & Type?

j. Has painting/staining been done in the last 6 months? Y (N) Where & When? _____

k. Is there new carpet, drapes or other textiles? Y /(N) Where & When? _____

l. Have air fresheners been used recently? Y / (N) When & Type? _____

m. Is there a kitchen exhaust fan? Y /(N) If yes, where vented? _____

n. Is there a bathroom exhaust fan? Y /(N) If yes, where vented? _____

o. Is there a clothes dryer? Y /(N) If yes, is it vented outside? Y / N

p. Has there been a pesticide application? Y / (N) When & Type? _____

Are there odors in the building? (Y)/ N
If yes, please describe: SLIGHT SOLVENT + LUBRICANT ODORS

Do any of the building occupants use solvents at work? (Y)/ N
(e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetologist

If yes, what types of solvents are used? CRYSTAL CLEAN MINERAL SPIRITS, COOLANTS

If yes, are their clothes washed at work? Y /(N)

Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response)

Yes, use dry-cleaning regularly (weekly) (No)
Yes, use dry-cleaning infrequently (monthly or less) Unknown
Yes, work at a dry-cleaning service

Is there a radon mitigation system for the building/structure? Y /(N) Date of Installation: _____
Is the system active or passive? Active/Passive

9. WATER AND SEWAGE

Water Supply: (Public Water) Drilled Well Driven Well Dug Well Other: _____

Sewage Disposal: (Public Sewer) Septic Tank Leach Field Dry Well Other: _____

10. RELOCATION INFORMATION (for oil spill residential emergency) N/A

a. Provide reasons why relocation is recommended: _____

b. Residents choose to: remain in home relocate to friends/family relocate to hotel/motel

c. Responsibility for costs associated with reimbursement explained? Y / N

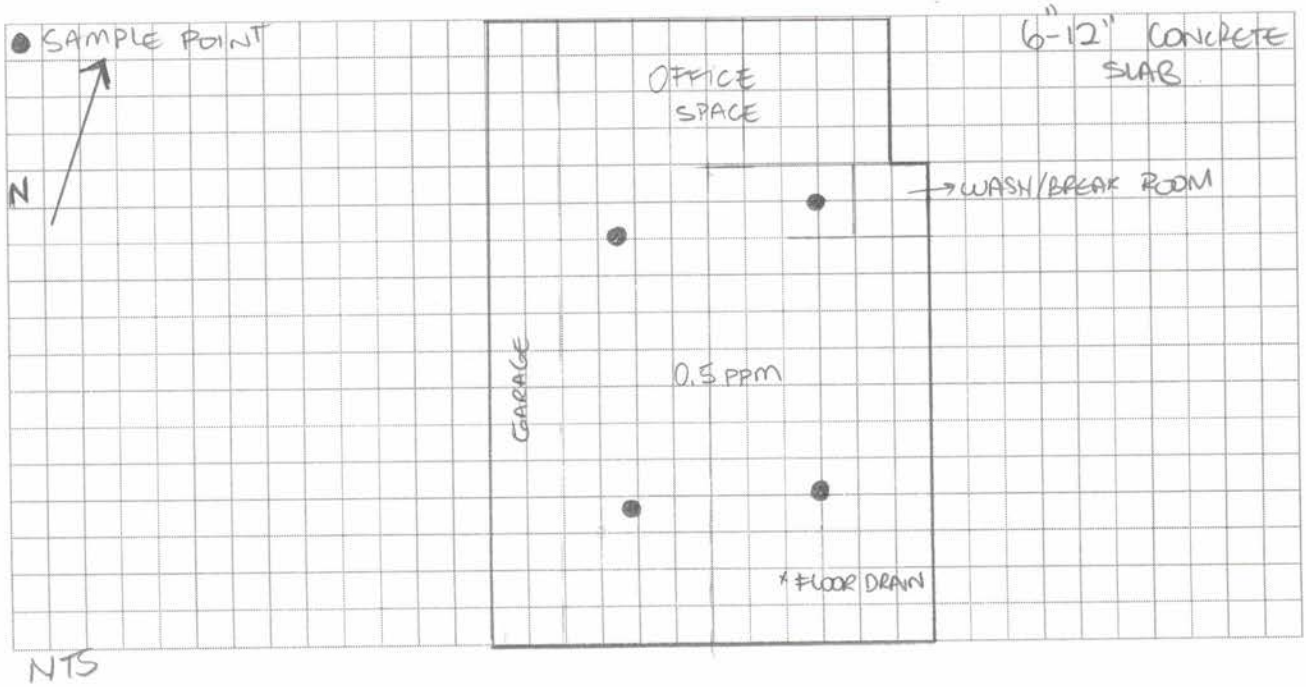
d. Relocation package provided and explained to residents? Y / N

11. FLOOR PLANS

Draw a plan view sketch of the basement and first floor of the building. Indicate air sampling locations, possible indoor air pollution sources and PID meter readings. If the building does not have a basement, please note.

Basement: NA

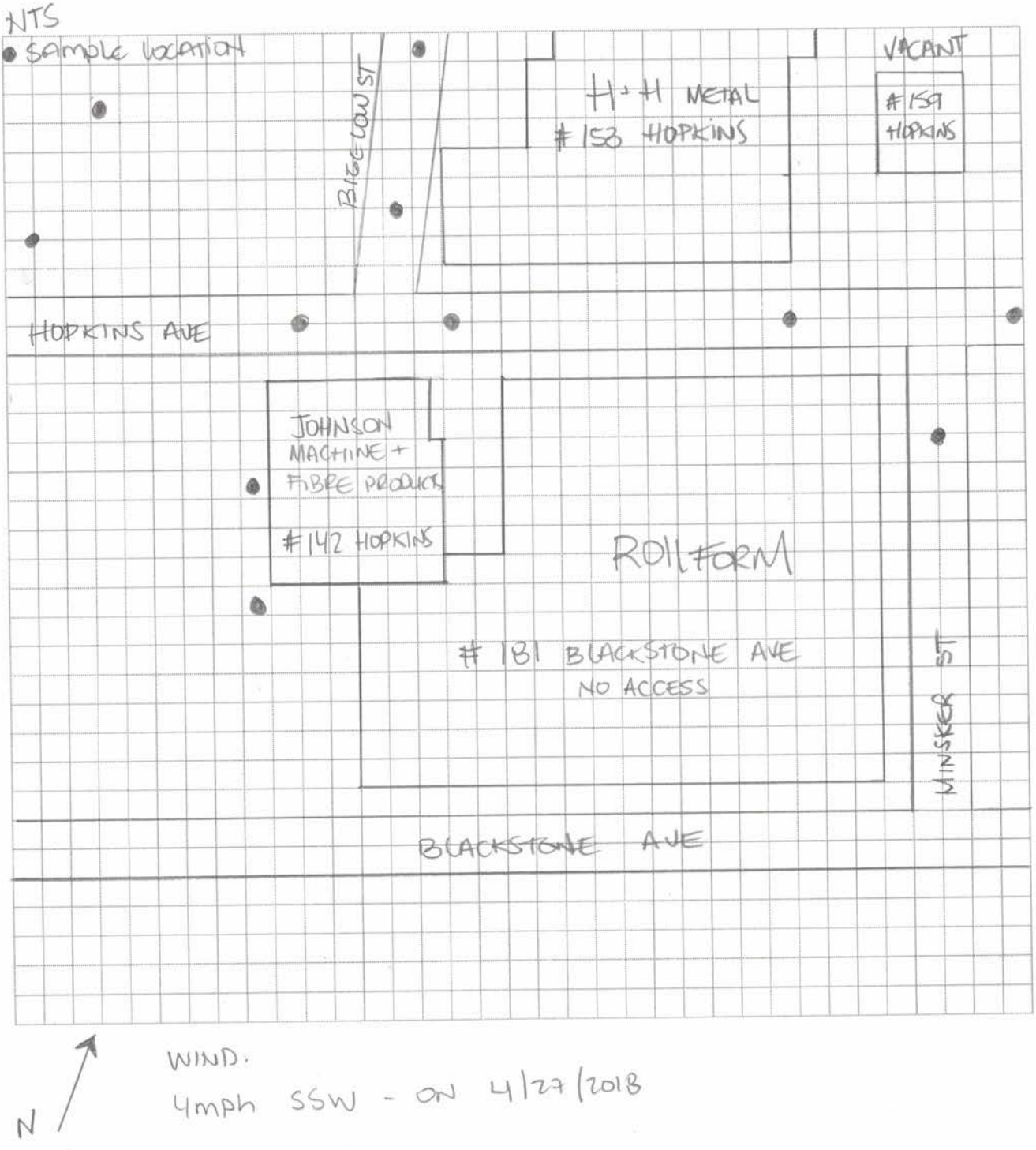
First Floor:



12. OUTDOOR PLOT

Draw a sketch of the area surrounding the building being sampled. If applicable, provide information on spill locations, potential air contamination sources (industries, gas stations, repair shops, landfills, etc.), outdoor air sampling location(s) and PID meter readings.

Also indicate compass direction, wind direction and speed during sampling, the locations of the well and septic system, if applicable, and a qualifying statement to help locate the site on a topographic map.



13. PRODUCT INVENTORY FORM

Make & Model of field instrument used: MINI RAE 2000 PHOTOIONIZATION DETECTOR (PID)

List specific products found in the residence that have the potential to affect indoor air quality.

Location	Product Description	Size (units) Gallons	Condition*	Chemical Ingredients	Field Instrument Reading (units) PPM	Photo ** Y / N
MANUFACTURING AREA	HOCUT WS 8900	(2) 55	U	METAL COOLANT: METHANOL, GLYCOLS, GLYCEROLS	0.5	N
	PROCUT 82	(2) 55	U	OIL BASED METAL CUTTING FLUID.	0.3	N
	CRYSTAL CLEAN 106	(2) 55	U	STODDARD SOLVENT	0.3	N
	UNMARKED LUBRICANT	5	U	BASE OIL + ADDITIVES	0.5	N
	UNMARKED HYDRAULIC OIL	(3) 55	U	OILS, BUTANOL, ESTERS, ADIPATES	0.1	N
	WOCOWAY 2 (15068)	(1) 55	U	LUBRICANT OIL	0.2	N

* Describe the condition of the product containers as **Unopened (UO), Used (U),** or **Deteriorated (D)**
** Photographs of the **front and back** of product containers can replace the handwritten list of chemical ingredients. However, the photographs must be of good quality and ingredient labels must be legible.

Appendix B
Utility Locate Summary

NYLD Infrastructure

NEW YORK LEAK DETECTION, INC.
PO Box 269, Jamesville, NY 13078
315-469-4601 info@nyld.com

Field Report – Utility Location

Date(s) on site: 11/6/18 to 11/7/18

Technician: Nick Starr **Other Technicians on site:** N/A

Customer: Jacobs

Site Address: 126 Hopkins Avenue, Jamestown, NY

Contact Person: Jon Gowing **Phone:** 519-497-2011

Scope of Work: Utility Location Services -- The only details provided was a request for 3 days of utility location.

Type of Service: *mark all that apply*

☐ *Leak Detection*	☐ *Comprehensive Leak Survey*	☐ *Pressurized Pipe Inspection*
☐ *Infrastructure Assessment*	☒ *Utility Location/GPR*	☐ *Utility Mapping/AutoCAD*
☐ *EM Survey*	☐ *Video Inspection*	☐ *Valve Exercising*

Type of Equipment Used: *mark all that apply*

☐ *Profiler EMP 400*	☒ *RD8000 Pipe & Cable Locator*	☐ *MetroTech vLocPro2*
☐ *LC2500 Leak Correlator*	☒ *Noggin 250 MHz*	☐ *PosiTector UTG G3*
☐ *S-30 Surveyor*	☐ *Noggin 500 MHz*	☐ *Video Inspection Camera*
☐ *Sonde / Locatable Rodder*	☒ *Conquest 1000 MHz*	☐ *Helium # Bottles*
☐ *Leica Robotic Total Station*	☐ *Leica RTK GPS*	☐ *JD7 Investigator*
☐ *Valve Maintenance Trailer*	☐ *Thermal Imaging Camera*	☐ *ZCorr Data Loggers*

Marking Used: *mark all that apply*

☒ *Paint*	☐ *Flags*	☐ *Chalk/Marker*
☐ *Tape*	☐ *Updated Onsite Mapping*	☐ *Other _____*

NYLD **Infrastructure**

NEW YORK LEAK DETECTION, INC.
PO Box 269, Jamesville, NY 13078
315-469-4601 info@nyld.com

Field Report – Utility Location

Site Access/Safety Training: N/A **Expiration Date:** N/A

Ground Cover/Weather Conditions: 11/6 – Partly cloudy with some rain around 60 degrees. 11/7 – Sunny around 50 degrees.

Instructions from Onsite Contact: Clear 17 exterior boring locations and 11 interior boring locations.

Information Transfer:

☒ *Information relayed on site to:*

Jon Gowing

In addition to this field report, mark all that apply:

☐ *Hand drawn sketch*

☐ *Photographs*

☐ *Surveyed and AutoCAD Mapping by NYLD*

☐ *Maps updated onsite*

☐ *Surveyed by others*

Notes/Testing Results:

A visual inspection was performed in the area of concern to assess for utility structures. Utilizing the RD8000 in conductive, inductive, and power/radio modes, located and marked out utilities as shown in the area below. Additional confirmation performed with the Noggin using the 250 and/or 500 MHz antenna and the Conquest 1000 MHz. GPR signal reception varies depending upon soil conditions. Therefore, it is utilized in combination with various other geophysical tools for the most accurate verification of known/unknown utilities and/or structures.

Utilities were painted in appropriate color.

Various exterior boring locations were moved to accommodate utilities in proximity. The new locations were marked on site and relayed to site contact. All other exterior boring locations are deemed clear.

All interior sampling locations had rebar in the concrete. The rebar was marked out on site using both white paint and black electrical tape. The cleared location for drilling was given by a red box marked in paint. Drilling is advised to take place within the red box. All information regarding interior locations relayed to on site contact.

This report is back up to information relayed and marked on site at time of service. It is for informational purposes only.

Key

Blue	Water
Red	Power
Orange	Communications
Yellow	Gas/Flammable Fuel
White	Unknown
Green	Storm/Sanitary

NYLD **Infrastructure**

NEW YORK LEAK DETECTION, INC.
PO Box 269, Jamesville, NY 13078
315-469-4601 info@nyld.com

Field Report – Utility Location



NYLD Infrastructure

NEW YORK LEAK DETECTION, INC.
PO Box 269, Jamesville, NY 13078
315-469-4601 info@nyld.com

Field Report – Utility Location

Subsurface Limitations

Utility locating is the art and science of using non-intrusive methods to search for, find and mark out buried, unseen conduits or other objects. There are innumerable variables involved in locating underground utilities, such as topography, size and complexity of job site, depth and proximity of buried utilities, above ground obstructions, short turnaround schedules, changes in the scope of work, lack of (or outdated) blueprints and adverse weather conditions.

New York Leak Detection, Inc. (NYLD) has made a substantial financial investment in crossover technologies and training to meet our clients' needs when locating and mapping utilities. However, due to unpredictable factors that may affect the results, NYLD makes no guarantee, expressed or implied, with respect to the completeness or accuracy of the information provided. Any use or reliance on the information or opinion is at the risk of the user and NYLD shall not be liable for any damage or injury arising out of the use or misuse of the information provided.

NYLD strives to provide the highest quality utility location services possible with the technical expertise of our field specialists and state-of-the-art equipment used. Every effort is made to provide our clients with the most accurate information possible without adverse consequences.

NYLD makes no guarantee that all subsurface utilities and obstructions will be detected. GPR signal penetration might not be sufficient to detect all utilities. NYLD is not responsible for detecting subsurface utilities and obstructions that normally cannot be detected by the methods employed or that cannot be detected because of site conditions. NYLD is not responsible for maintaining mark-outs after leaving the work area. Mark-outs made in inclement weather and in high traffic areas may not last. Surveyor assumes responsibility of picking up data on site.

Appendix C
Soil Vapor Probe Diagrams

JACOBS

SV-12

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/13/19

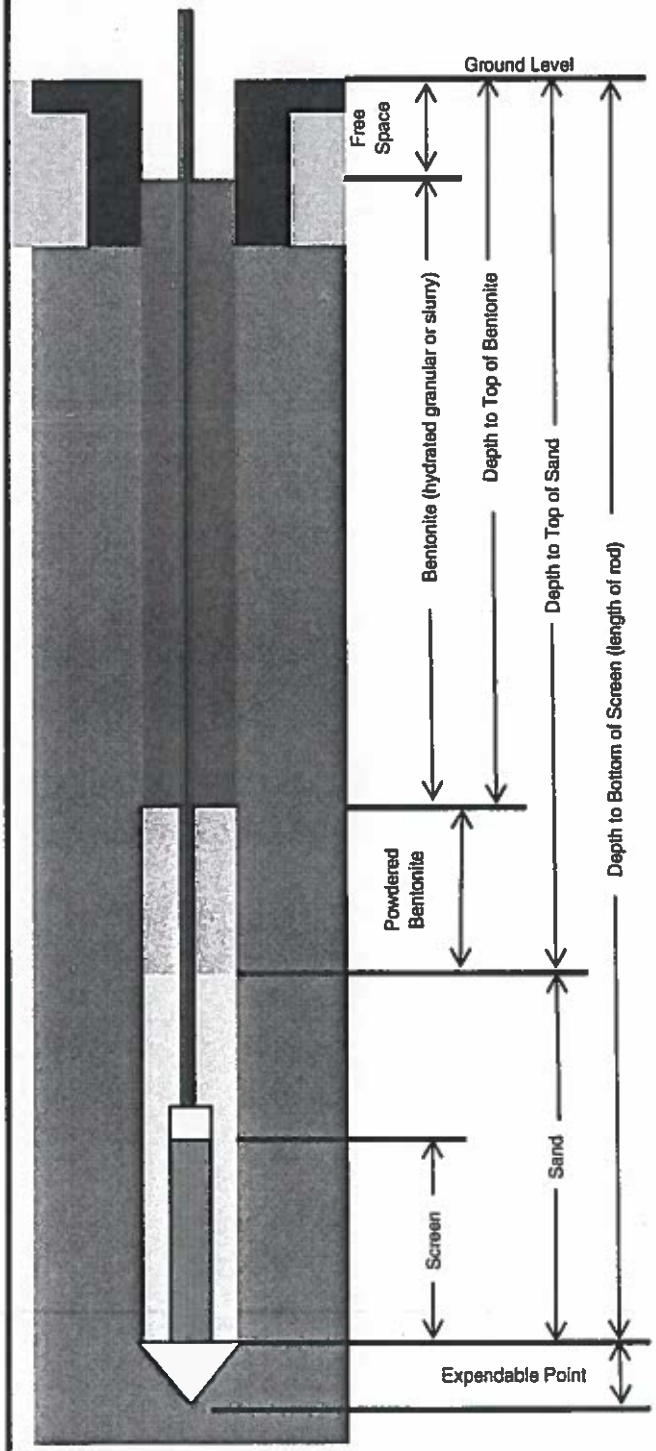
Soil Vapor Probe Diagram

PROJECT: Offsite VI investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1340 END: 1350 Installer: J. Gawlik



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) No 28

Bentonite: Enviro Plug Powdered No. 16

JACOBS

SV-14

PROJECT NUMBER	PROBE NUMBER
703765CH	SHEET 1 OF 1 DATE: 11/13/18

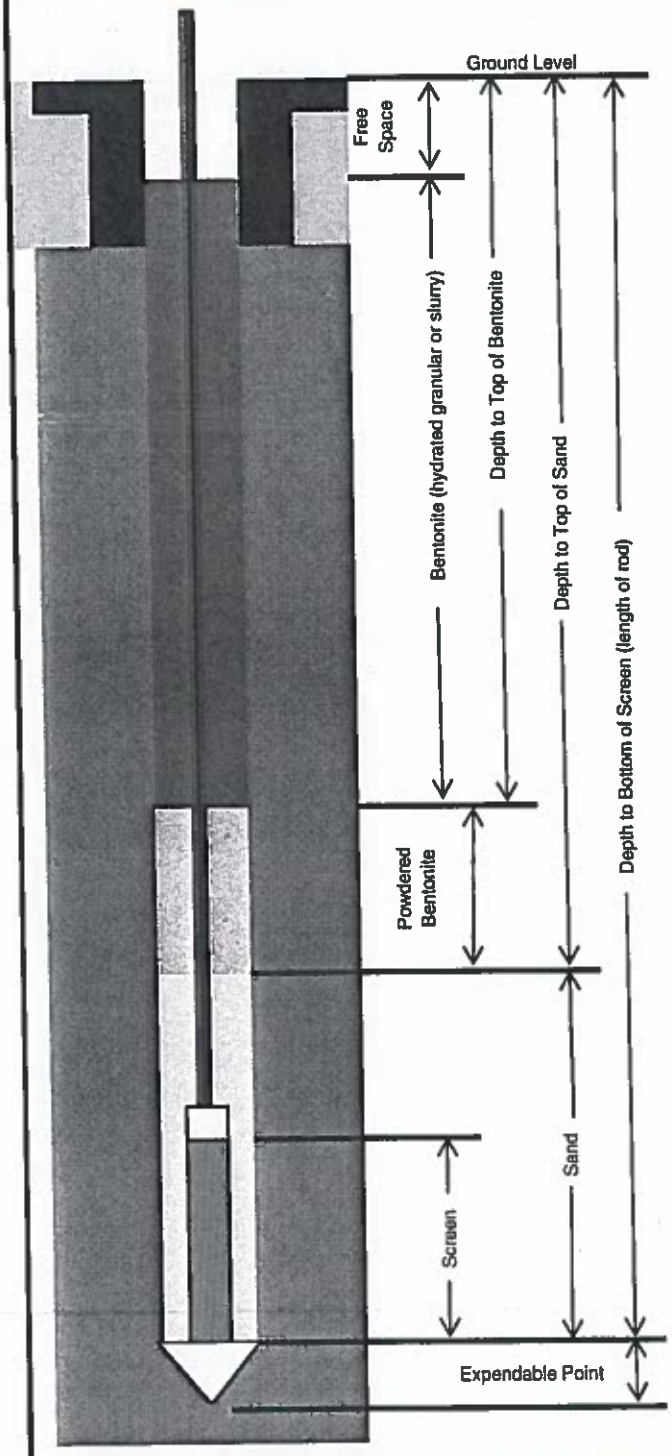
Soil Vapor Probe Diagram

PROJECT: offsite VI investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1310 END: 1320 Installer: J. Gowing



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) No. 28

Bentonite: Enviro Plug - Powdered No. 1

Expendable Point

JACOBS

SV-15

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/13/18

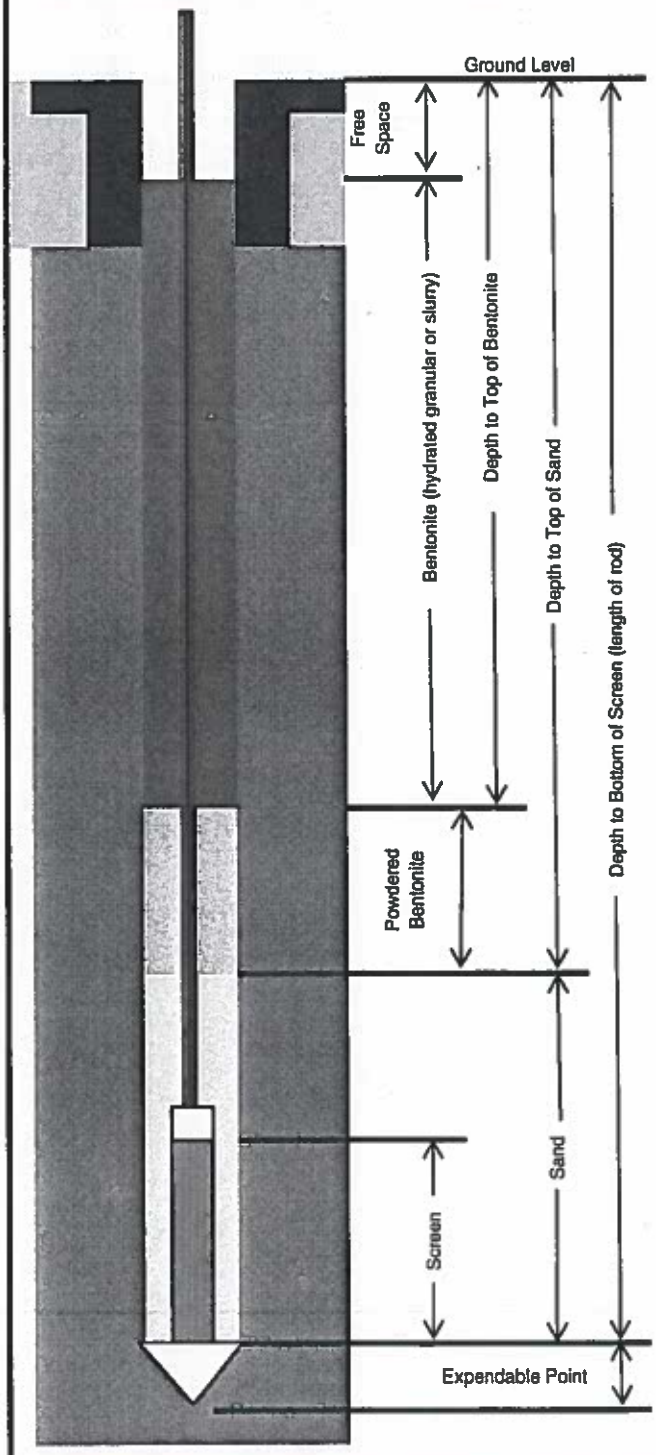
Soil Vapor Probe Diagram

PROJECT: offsite VI investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1355 END: 1410 Installer: J. Gaving



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) (No 28)

Bentonite: Enviro Plug Powdered No. 16

JACOBS

SV-10

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/13/18

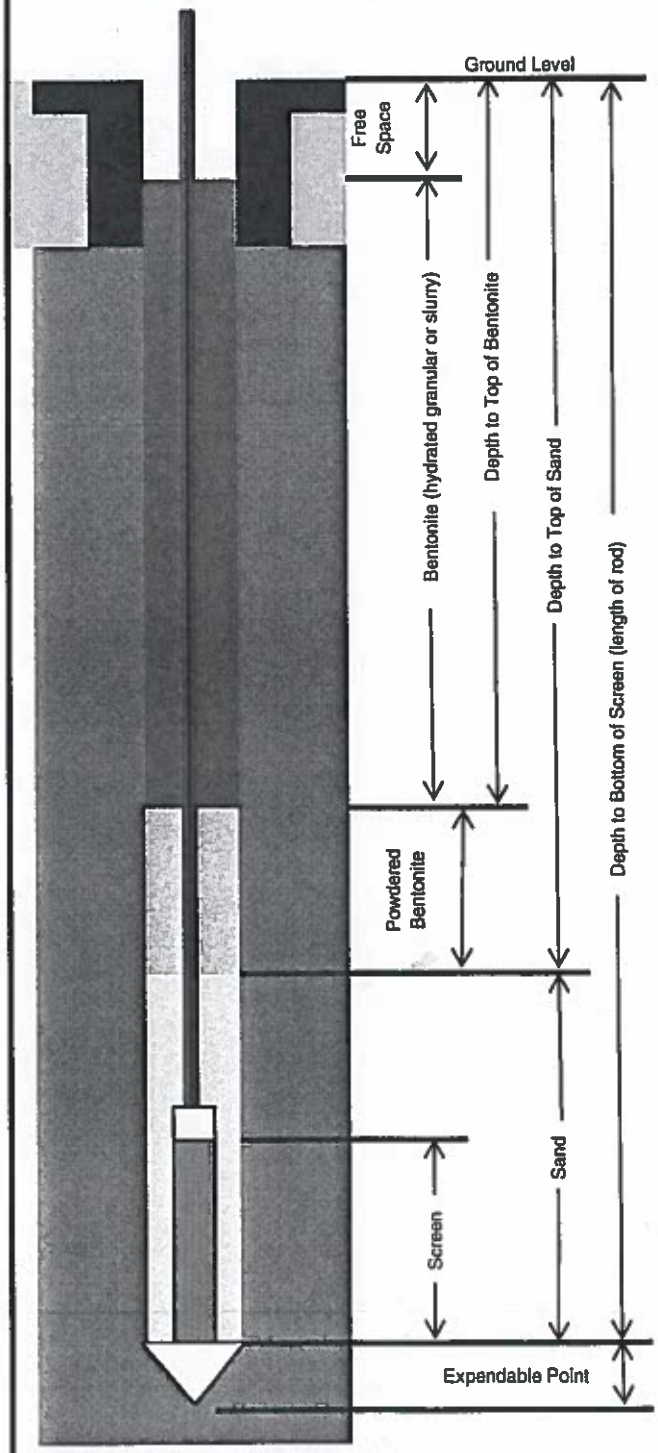
Soil Vapor Probe Diagram

PROJECT: Offsite VI Investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1430 END: 1505 Installer: J. Gowing



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (No. 28)

Bentonite: Enviro Plug Powdered (No. 16).

JACOBS

SV-09

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/13/18

Soil Vapor Probe Diagram

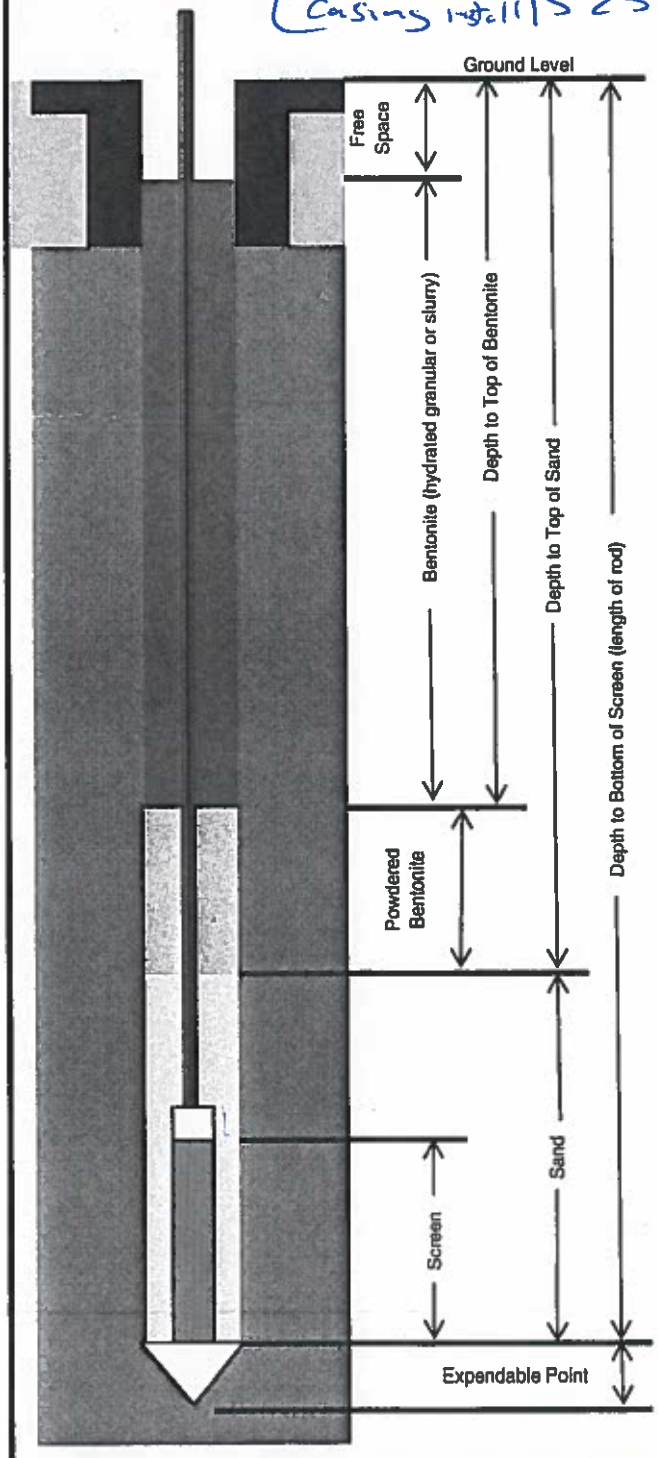
PROJECT: offsite VI investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parrat Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1125 END: 1140 Installer: J. Cowing

(Casing Install 1125)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) (No. 28)

Bentonite: ENVIRO Plug Powdered. (No. 16)

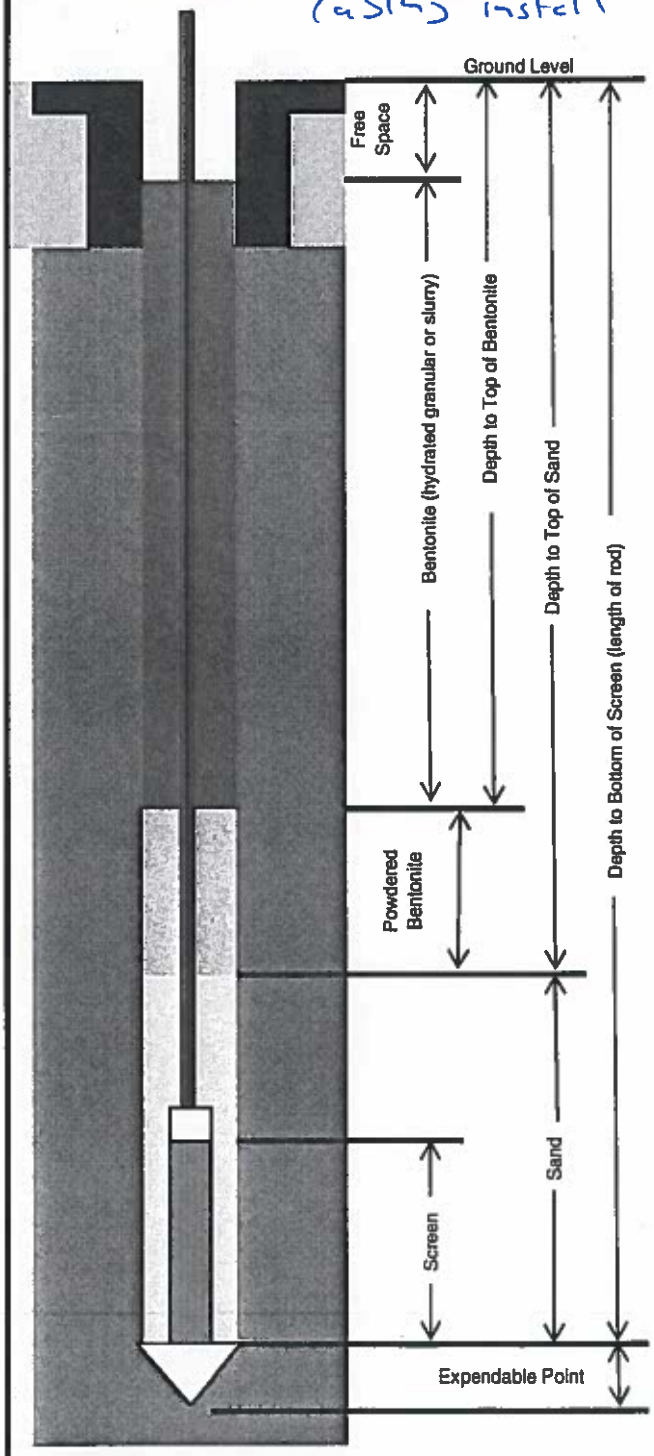
JACOBS

SV-08

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/15/18

Soil Vapor Probe Diagram

PROJECT: offsite VI investigation LOCATION: Jamestown NY
DRILLING CONTRACTOR: Parratt Wolff
DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe
START: 1145 END: 1155 Installer: J. Gowing
(casing install 1540)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) (No. 2S)

Bentonite: Enviro Plug Powdered (No. 16)

JACOBS

SV-11

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/15/18

Soil Vapor Probe Diagram

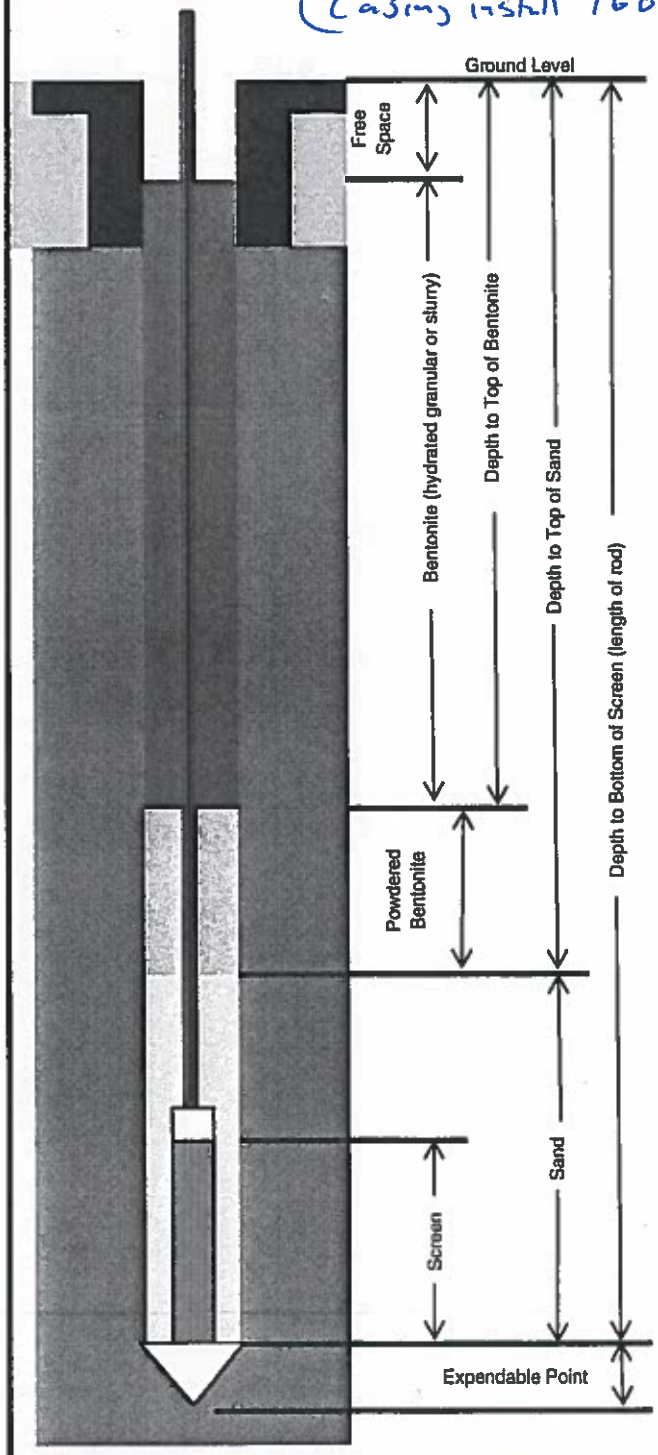
PROJECT: Offsite VI investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1200 END: 1220 Installer: J. Gavings

(Casing install 1600)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) (No. 28)

Bentonite: Envirp Plug, Powdered (No. 16).

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SV-13

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/15/18

Soil Vapor Probe Diagram

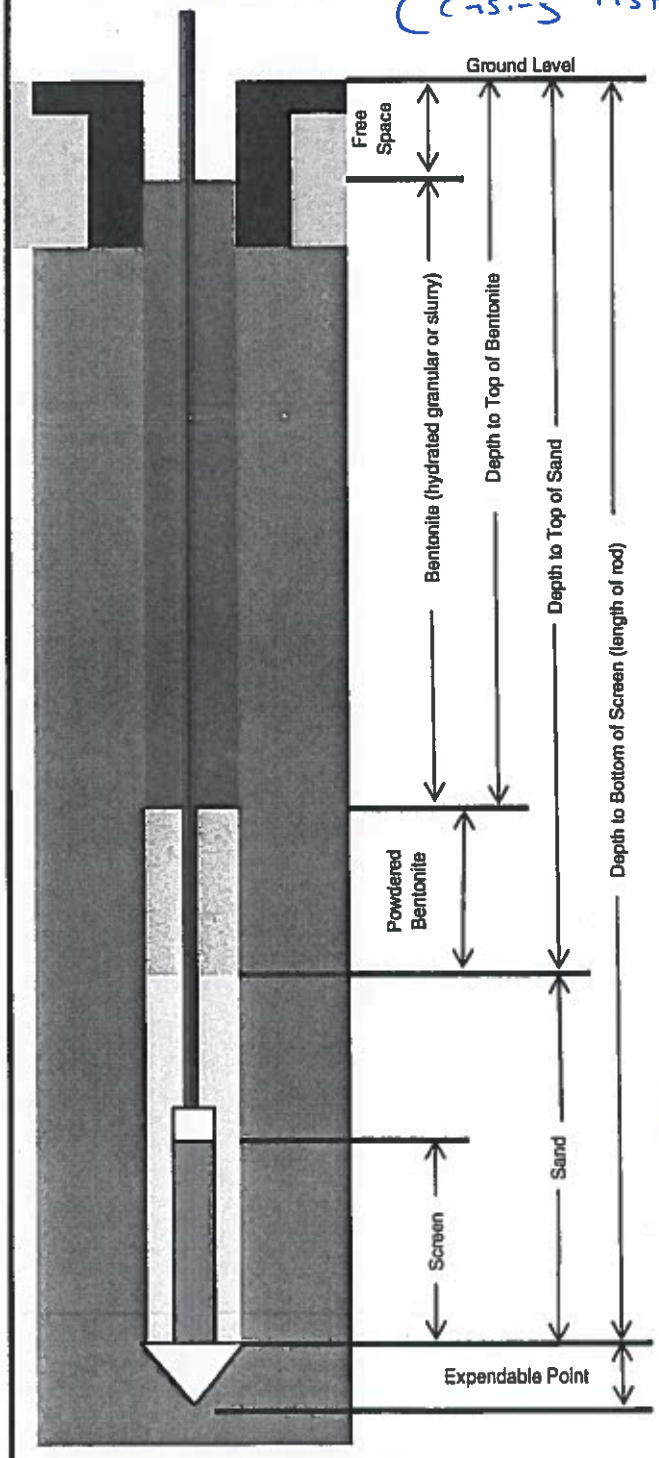
PROJECT: offsite VI Investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1250 END: 1305 Installer: J. Gowing

(Casing install 1620)



Outer Diameter of Rod (in.)	2 1/4 "
Depth to Bottom of Screen (ft)	7 '
Length of Expendable Point (in.)	3 "
Screen Diameter (in.) / Length (in.)	1/2 "
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12 "
Depth to Top of Sand (ft)	6 '
Length of Powdered Bentonite Seal (in.)	6 "
Depth to Top of Powdered Bentonite (ft)	5.5 '
Length of Bentonite (ft)	4 '
Depth to Top of Bentonite (ft)	1 '
Length of Free Space (in.)	1 "
Flush Mount Diameter.	4 "

Specifications (Quantity and Type)

Sand: natural Sand (Sable) No. 28

Bentonite: Envirp Plug No. 16 (Powdered)

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SV-16

PROJECT NUMBER	PROBE NUMBER
703765CH	SHEET 1 OF 1 DATE: 11/13/08

Soil Vapor Probe Diagram

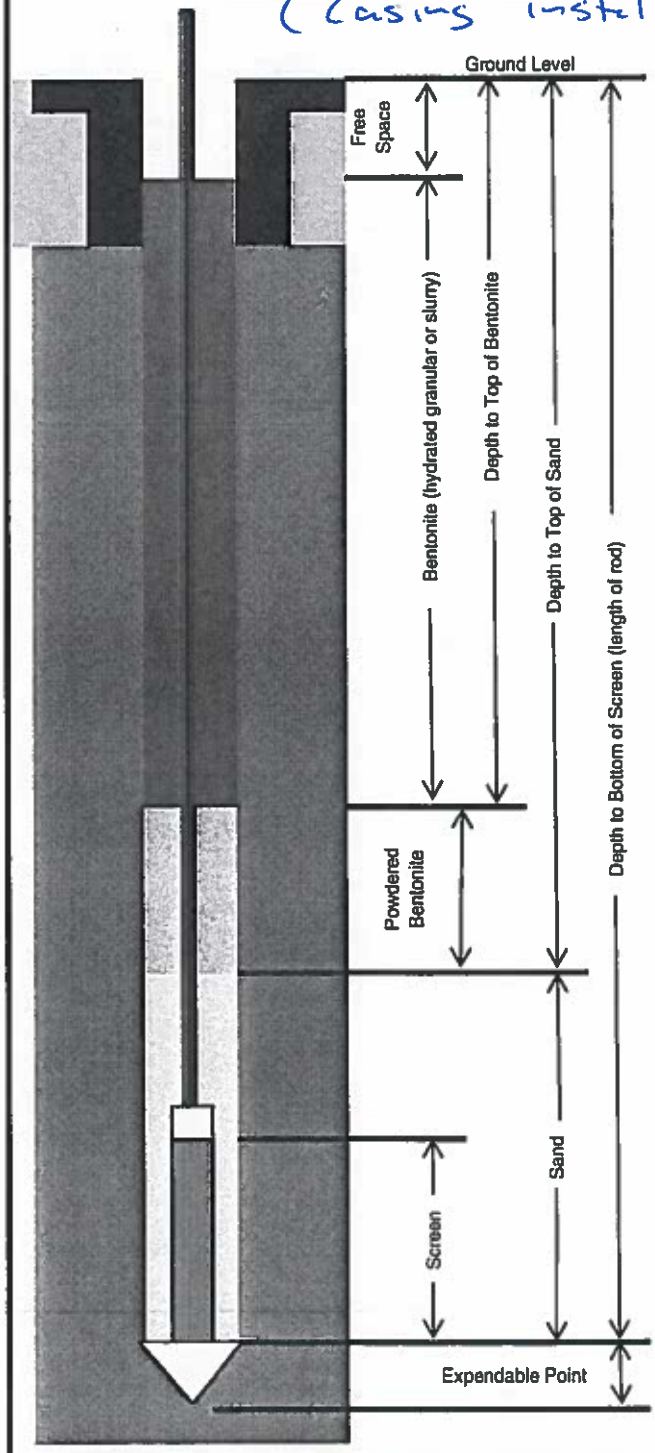
PROJECT: Offsite VI Investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 1320 END: 1335 Installer: J. Gowing

(Casing install 1640)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) (No. 20)

Bentonite: Enviro Plug Powdered (No. 16)

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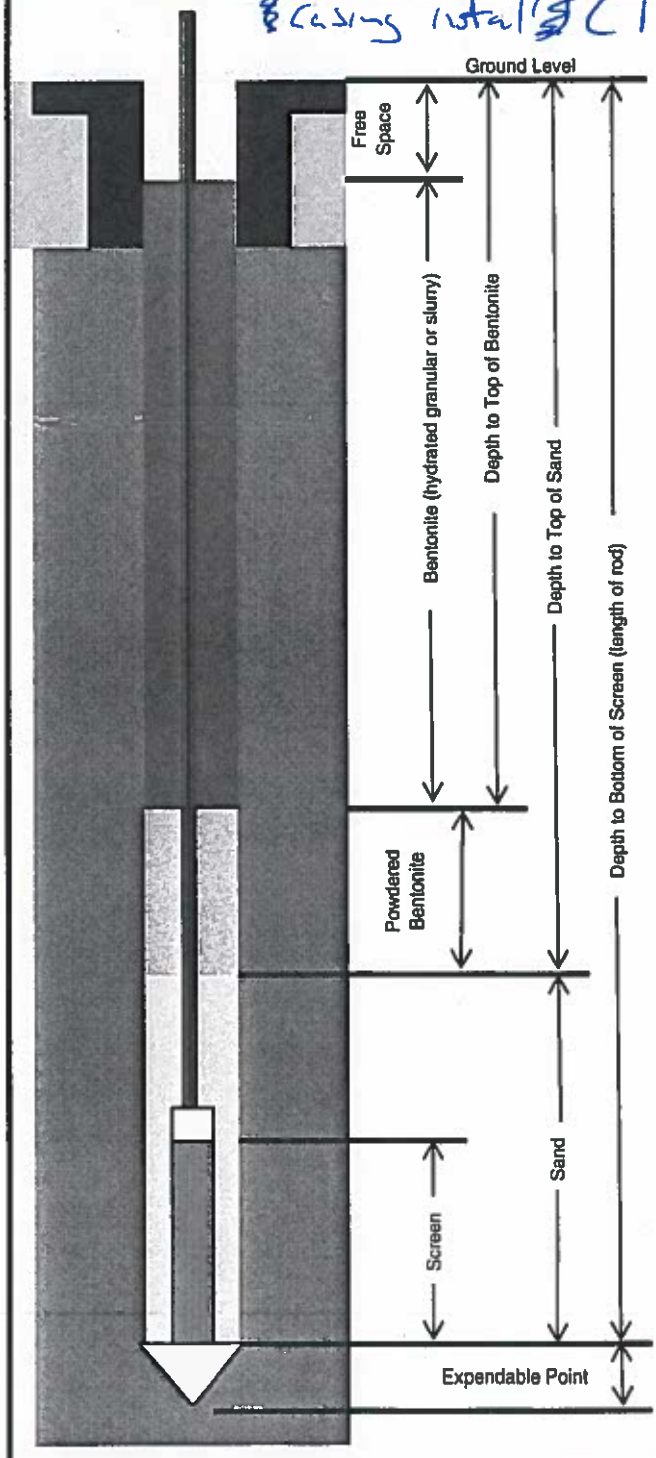
PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/13/18

SV-04

Soil Vapor Probe Diagram

PROJECT: Offsite VI Investigation LOCATION: Jamestown NY
DRILLING CONTRACTOR: Parratt Wolff
DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe
START: 0830 END: 0850 Installer: J Fewing

Casing Install (1015)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) (No. 7S)

Bentonite: Enviro Plug Powdered (No. 1)

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SV-05

PROJECT NUMBER	PROBE NUMBER
703765CH1	SHEET 1 OF 1 DATE: 11/13/18

Soil Vapor Probe Diagram

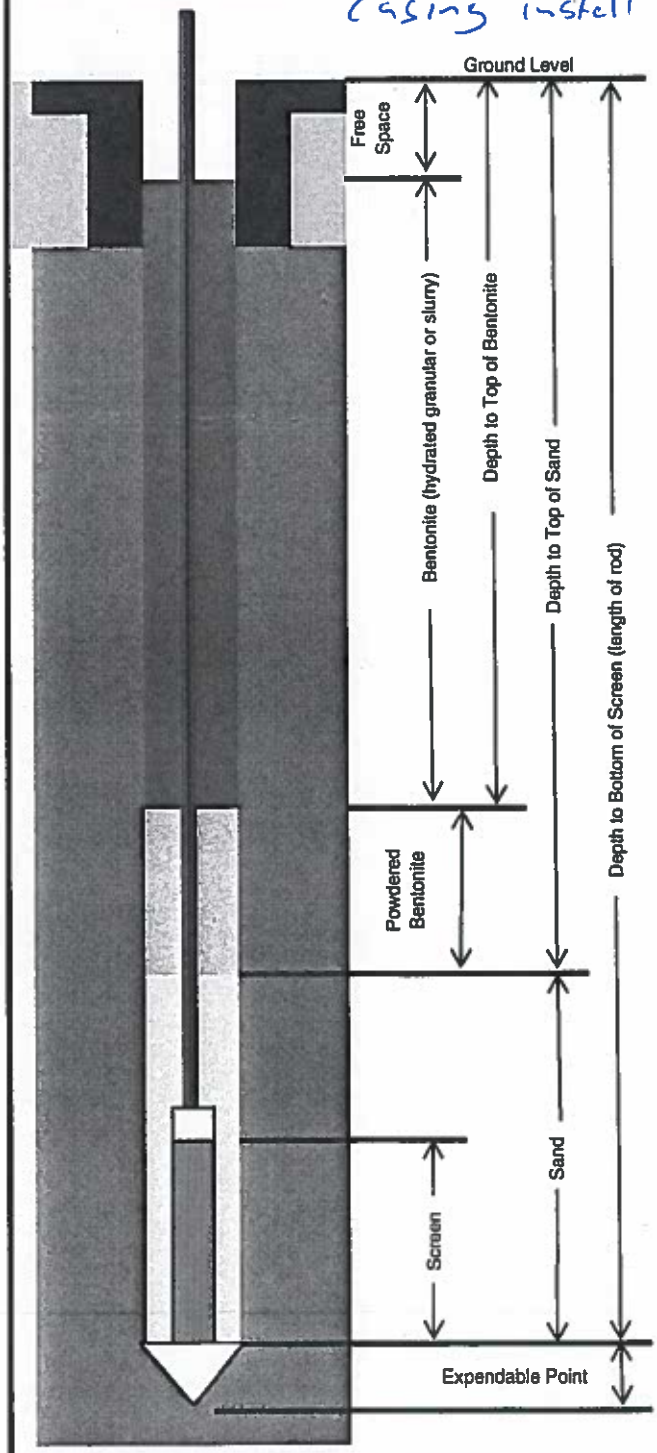
PROJECT: offsite Vi Investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 0850 END: 0910 Installer:

Casing install (1035)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/6"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sable) (No 28)

Bentonite: Envirp Plus Powdered (No 16)

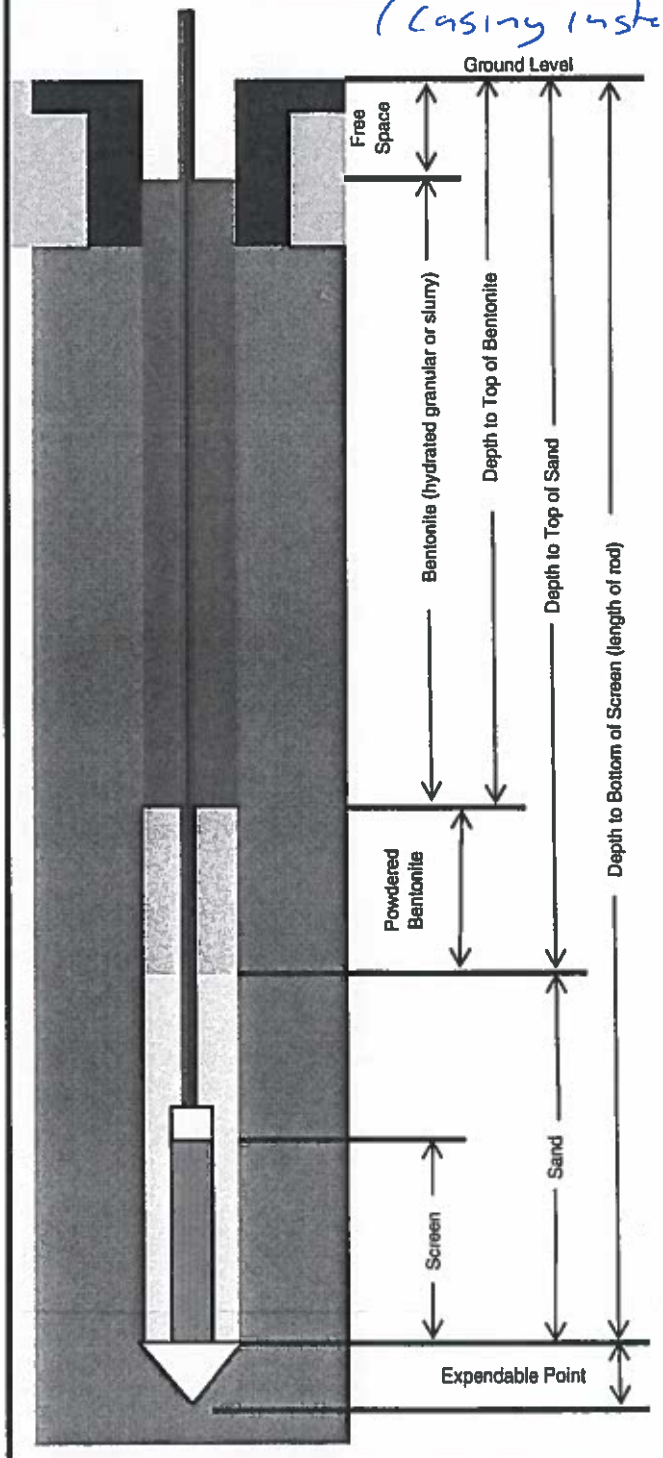
JACOBS

SV-06

PROJECT NUMBER	PROBE NUMBER
703765 CM	SHEET 1 OF 1 DATE: 11/13/18

Soil Vapor Probe Diagram

PROJECT: Offsite VI Investigation LOCATION: Jamestown NY
DRILLING CONTRACTOR: Parratt Wolff
DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe
START: 0915 END: 0930 Installer: J. Fleming
(Casing install 1055)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Gable) (No 78)

Bentonite: Envirp Plus Powdered (No 16)

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SV-07

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/13/18

Soil Vapor Probe Diagram

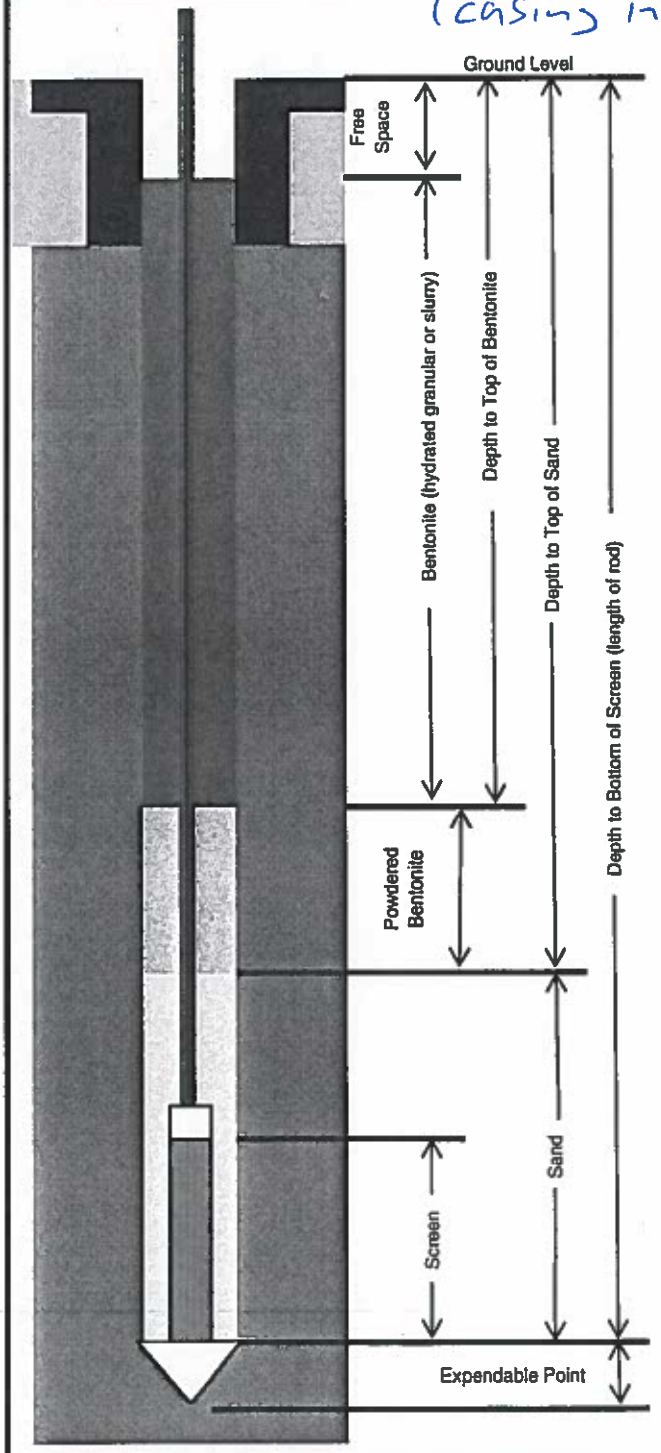
PROJECT: offsite VI Investigation LOCATION: Jamestown NY

DRILLING CONTRACTOR: Parratt Wolff

DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe

START: 0935 END: 0955 Installer:

(casing install 1115)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Natural Sand (Sakle) (No 25)

Bentonite: Enviro Plus Powdered (No 16)

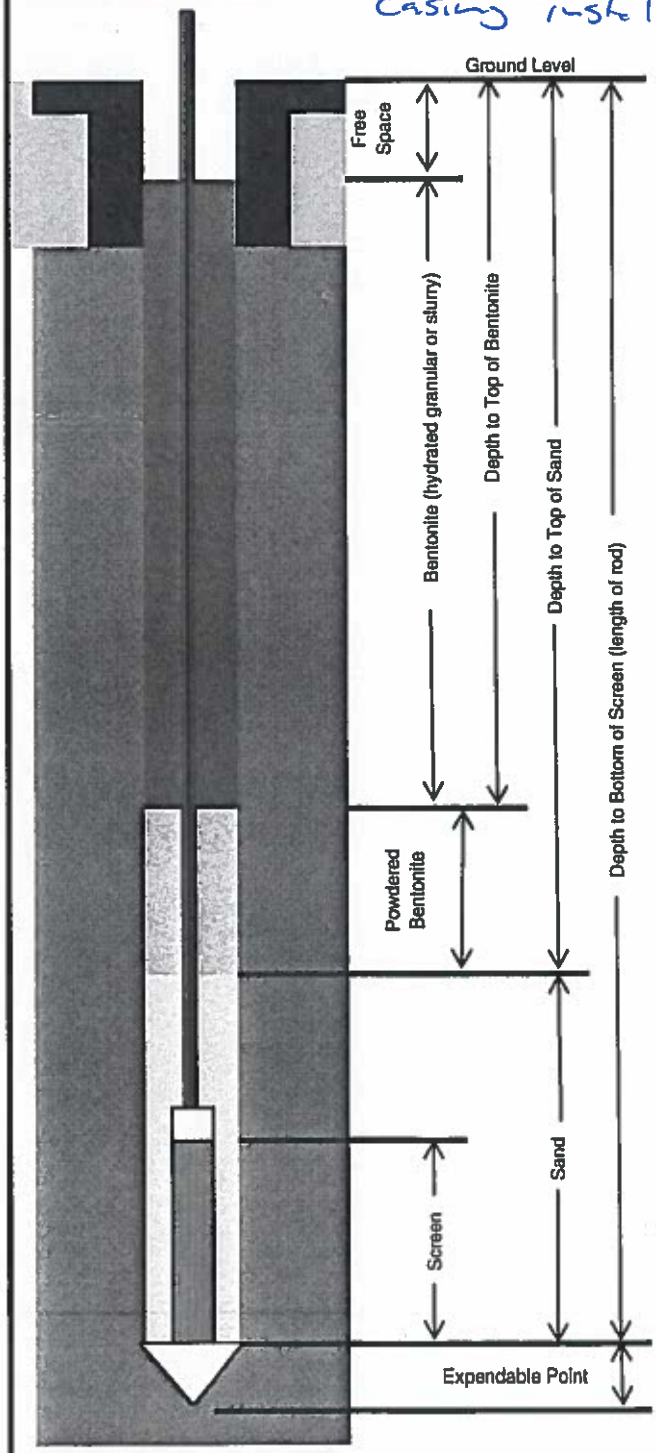
JACOBS

SV-01

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/12/18

Soil Vapor Probe Diagram

PROJECT: offsite VI investigation LOCATION: Jamestown NY
DRILLING CONTRACTOR: Pratt W&M
DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe
START: 1445 END: 1510 Installer: J. Gowing
Casing install (1515)



Outer Diameter of Rod (in.)	2 1/4 "
Depth to Bottom of Screen (ft)	7 '
Length of Expendable Point (in.)	3 "
Screen Diameter (in.) / Length (in.)	1/2 "
Screen Mesh (in.)	fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12 "
Depth to Top of Sand (ft)	6 '
Length of Powdered Bentonite Seal (in.)	6 "
Depth to Top of Powdered Bentonite (ft)	5.5 '
Length of Bentonite (ft)	4 '
Depth to Top of Bentonite (ft)	1 '
Length of Free Space (in.)	1 "
Flush Mount Diameter.	4 "

Specifications (Quantity and Type)

Sand: natural Sand
Sable 28

Bentonite: Enviro Plug No. 16
(Powdered)

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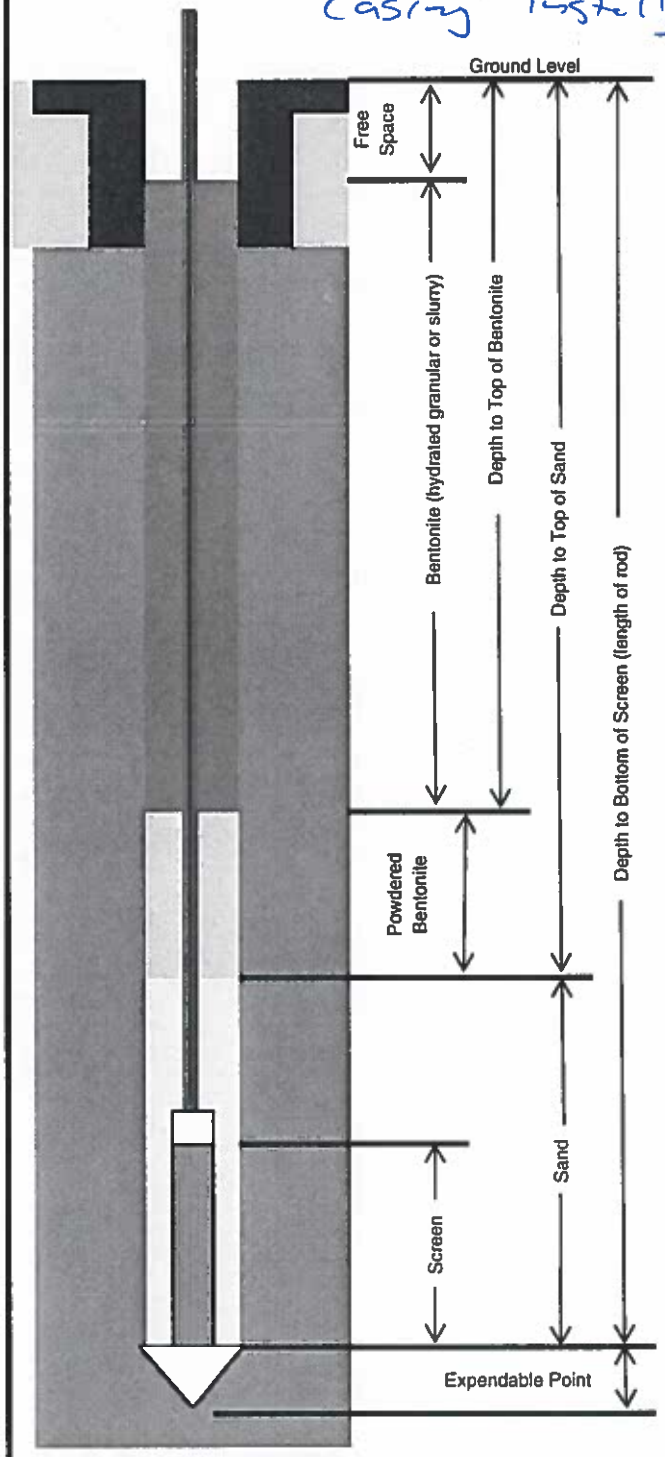
SV-02

PROJECT NUMBER	PROBE NUMBER
703765 CH	SHEET 1 OF 1 DATE: 11/12/2018

Soil Vapor Probe Diagram

PROJECT: offsite VI investigation LOCATION: Jamestown NY
DRILLING CONTRACTOR: Parratt Wolff
DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe
START: 1415 END: 1435 Installer: J Groves

Casing Install (1535)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5'
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter	4"

Specifications (Quantity and Type)

Sand: (Sable) Natural Sand (20)

Bentonite: Envirco Plug No 16 (powdered)

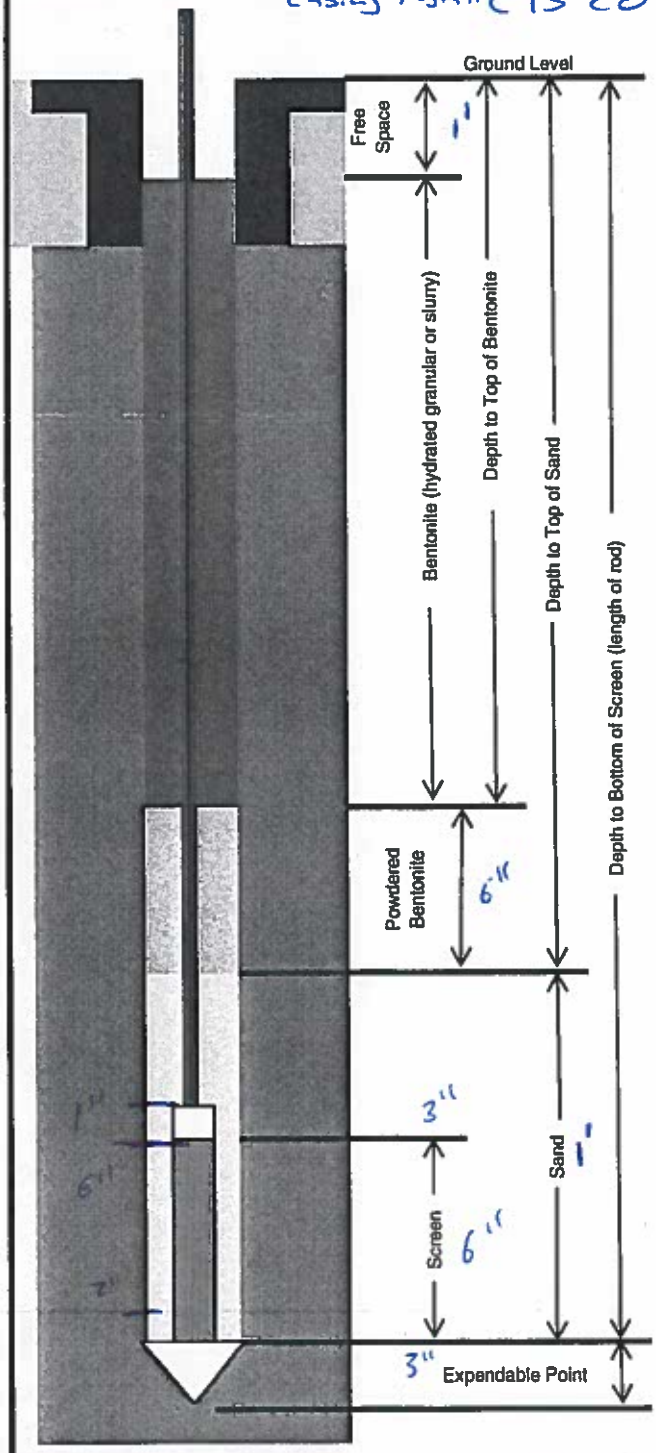
JACOBS

~~#03~~ SV-03

PROJECT NUMBER	PROBE NUMBER
703765CH	SHEET 1 OF 1 DATE: 11/12/18

Soil Vapor Probe Diagram

PROJECT: offsite Vapor Intrusion investigation LOCATION: Jamestown NY
DRILLING CONTRACTOR: Parratt Wolff
DRILLING METHOD AND EQUIPMENT USED: Direct Push Geoprobe
START: 1310 END: 1415 Installer: J. Gowings
Casing install (1520)



Outer Diameter of Rod (in.)	2 1/4"
Depth to Bottom of Screen (ft)	7'
Length of Expendable Point (in.)	~~4"~~ 3"
Screen Diameter (in.) / Length (in.)	1/2"
Screen Mesh (in.)	Fine
Teflon Tubing Outer Diameter (in.)	0.25
Length of Sand Pack (in.)	12"
Depth to Top of Sand (ft)	6'
Length of Powdered Bentonite Seal (in.)	6"
Depth to Top of Powdered Bentonite (ft)	5.5"
Length of Bentonite (ft)	4'
Depth to Top of Bentonite (ft)	1'
Length of Free Space (in.)	1'
Flush Mount Diameter.	4"

Specifications (Quantity and Type)

Sand: Sable Natural Sand (28)

Bentonite: Enviro Plug No 16 (Powdered)

6ft of 1 1/4" ID PVC riser installed with 1015 well adjacent to water

Direct push*

Appendix D
Data Quality Evaluations

JACOBS®

Memorandum

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Dallas, Texas 75201
United States
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F +1.214.638.0447
www.jacobs.com

Subject **Data Quality Evaluation for the 2018 Vapor Intrusion Investigation, Dow Jamestown, New York**

Attention Union Carbine Corporation

From Jacobs

Date February 12, 2019

1. Introduction

The objective of this data quality evaluation (DQE) report is to assess the data quality of analytical results for air samples collected from the Dow Chemical Company (Dow) Jamestown Facility in Jamestown, New York. Jacobs collected samples November 14-15, 2018 and December 11-12, 2018. Guidance for this DQE report came from the following: *Quality Assurance Project Plan, Site Characterization Investigation Activities, Essex-Hope Site, Jamestown, New York, June 2016 (QAPP)*; *the QAPP Addendum, August 2018*; the *U.S. Environmental Protection Agency* (EPA) *National Functional Guidelines for Superfund Organic Methods Data Review,* January 2017*;* and, individual method requirements.

The analytical results were evaluated using the criteria of precision, accuracy, representativeness, comparability and completeness (PARCC) as described in the QAPP. This report is intended as a general data quality assessment designed to summarize data issues.

2. Analytical Data

Jacobs collected 16 soil vapor samples, 11 indoor air samples 2 soil vapor field duplicate samples (FD), 2 indoor air FDs and one trip blank (TB). The samples were reported in three sample delivery groups identified as 1811372R1, L1847517 and L1851659.

Samples were collected and delivered to Eurofins Air Toxics Laboratory in Folsom, California and Alpha Analytical Laboratory in Mansfield, Massachusetts. The samples were analyzed by one or more of the methods listed in Table 1.

Table 1. Analytical Parameters. 2018 Vapor Intrusion Investigation, Dow Jamestown, New York

Parameter	Method	Laboratory
Volatile Organic Compounds (VOC)	TO-15	Alpha
VOC	TO-17	Air Toxics

The sample delivery groups were assessed by reviewing the following: (1) the chain of custody documentation; (2) holding-time compliance; (3) calibration; (4) method blanks/field blanks; (5) laboratory control spiking sample/laboratory control spiking sample duplicate (LCS/LCSD) recoveries and precision; (6) internal standard recoveries; (7) surrogate spike recoveries; (8) FD precision, and (9) required method quality control (QC) samples at the specified frequencies.

Data flags were assigned according to the QAPP. Multiple flags are routinely applied to specific sample method/matrix/analyte combinations, but there will only be one final flag. A final flag is applied to the data and is the most conservative of the applied validation flags. The final flag also includes matrix and blank sample impacts.

The data flags are those listed in the QAPP and are defined below:

- J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- R = The sample result was rejected due to serious deficiencies in the ability to analyze the sample and meet the QC criteria. The presence or absence of the analyte could not be verified.
- U = The analyte was analyzed for but was not detected above the reported sample quantitation limit.
- UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

3. Findings

The overall summaries of the data validation are contained in the following sections. Qualified data are presented in Table 2.

4. Holding Time and Preservation

All holding time and preservation criteria were met.

5. Calibration

Initial and continuing calibration analyses were performed as required by the methods and acceptance criteria were met.

6. Method Blanks

Method blanks were analyzed at the required frequency and were free of contamination.

7. Laboratory Control Samples

LCS/LCSDs were analyzed as required and accuracy and precision criteria were met.

8. Surrogates

Surrogates were added to the samples and acceptance criteria were met.

9. Internal Standards

Internal standards were added to the samples and acceptance criteria were met.

10. Field Blanks

One TB was collected, analyzed and was free of contamination

11. Field Duplicates

FDs were collected, analyzed and precision criteria were met with the following exceptions:

- The relative percent differences (RPD) for several analytes exceeded criteria in FD pairs SV-07_20181212 -FD and SV-10_20181213/ SV-10_20181213-FD. The data were qualified as estimated detected and non-detected results and flagged “J” and “UJ”, respectively in the FD pairs.

12. Canister/Flow Controller Certifications

Jacobs collected the air samples in SUMMA canisters that were batch certified “clean” per project instructions before shipment to the project site.

13. Chain of Custody

Required procedures were followed and COCs were generally free of errors.

14. Overall Assessment

The goal of this assessment is to demonstrate that a sufficient number of representative samples were collected, and the resulting analytical data can be used to support the decision-making process. The following summary highlights the PARCC findings for the above-defined events:

Precision of the data was verified through the review of the field and laboratory data quality indicators that include: FD and LCS/LCSD RPDs. Precision was generally acceptable; however, a few analytes were qualified as estimated detected and non-detected results in four samples due to FD RPD issues. Data users should consider the impact to any result that is qualified as estimated as it may contain a bias which could affect the decision-making process.

Accuracy of the data was verified through the review calibration, LCS/LCSD, surrogate and internal standard recoveries, as well as the evaluation of method/field blank data. Accuracy was acceptable.

Representativeness of the data was verified through the sample’s collection, storage and preservation procedures and the verification of holding-time compliance. No issues were reported for sample collection and storage procedures. The data were reported from analyses within the EPA recommended holding time.

Comparability of the data was verified through the use of standard EPA analytical procedures and standard units for reporting. Results obtained are comparable to industry standards in that the collection and analytical techniques followed approved, documented procedures.

Completeness is a measure of the number of valid measurements obtained in relation to the total number of measurements planned. Completeness is expressed as the percentage of valid or usable measurements compared to planned measurements. Valid data are defined as all data that are not rejected for project use. All data were considered valid.

The data can be used for project decisions taking into consideration the validation flags applied to the samples.

Table 2. Data Qualification Summary. 2018 Vapor Intrusion Investigation, Dow Jamestown, New York

Field ID	Method	Analyte	Units	Final Result	Validation Flag	Validation Reason
SV-07_20181212	TO-15	Tetrachloroethene	µg/m3	3.07	UJ	FD>RPD
SV-07_20181212	TO-15	Trichloroethene	µg/m3	18.3	J	FD>RPD
SV-07_20181212	TO-15	Vinyl chloride	µg/m3	2.24	J	FD>RPD
SV-07_20181212	TO-15	cis-1,2-Dichloroethene	µg/m3	5.71	J	FD>RPD

Table 2. Data Qualification Summary. 2018 Vapor Intrusion Investigation, Dow Jamestown, New York

Field ID	Method	Analyte	Units	Final Result	Validation Flag	Validation Reason
SV-07_20181212-FD	TO-15	Tetrachloroethene	µg/m3	8.88	J	FD>RPD
SV-07_20181212-FD	TO-15	Trichloroethene	µg/m3	7.79	J	FD>RPD
SV-07_20181212-FD	TO-15	Vinyl chloride	µg/m3	1.16	UJ	FD>RPD
SV-07_20181212-FD	TO-15	cis-1,2-Dichloroethene	µg/m3	3.68	J	FD>RPD
SV-10_20181213	TO-15	Tetrachloroethene	µg/m3	3.08	UJ	FD>RPD
SV-10_20181213	TO-15	Trichloroethene	µg/m3	5.75	J	FD>RPD
SV-10_20181213	TO-15	Vinyl chloride	µg/m3	3.02	J	FD>RPD
SV-10_20181213	TO-15	cis-1,2-Dichloroethene	µg/m3	4.76	J	FD>RPD
SV-10_20181213-FD	TO-15	Tetrachloroethene	µg/m3	35.3	J	FD>RPD
SV-10_20181213-FD	TO-15	Trichloroethene	µg/m3	10.5	J	FD>RPD
SV-10_20181213-FD	TO-15	Vinyl chloride	µg/m3	6.03	J	FD>RPD
SV-10_20181213-FD	TO-15	cis-1,2-Dichloroethene	µg/m3	8.76	J	FD>RPD
Validation Reasons:						
FD>RPD	The relative percent difference exceeded criteria in the FD pair					

Note:
µg/m3 = micrograms per cubic meter

15. References

CH2M HILL. 2018. *Quality Assurance Project Plan Addendum for the Site Characterization Investigation Activities, Essex-Hope Site, Jamestown, New York*. Prepared for Essex Specialty Products, Inc. August.

USEPA. 2017. *USEPA National Functional Guidelines for Organic Superfund Methods*

Data Review. OLEM 9355.0-136. EPA-540-R-2017-002. January.

CH2M HILL. 2016. *Quality Assurance Project Plan for the Site Characterization Investigation Activities, Essex-Hope Site, Jamestown, New York*. Prepared for Union Carbide Corporation. June.

Appendix E
Laboratory Analytical Reports

eurofins | Air Toxics

12/12/2018
Ms. Shane Lowe
CH2M Hill
300 Hunter Ave
Suite 305
St. Louis MO 63124

Project Name: Essex - Hope
Project #: 703765CH.01.03
Workorder #: 1811372R1

Dear Ms. Shane Lowe

The following report includes the data for the above referenced project for sample(s) received on 11/19/2018 at Air Toxics Ltd.

The data and associated QC analyzed by Passive S.E. WMS are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Brian Whittaker at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Brian Whittaker

Project Manager

eurofins | Air Toxics

WORK ORDER #: 1811372R1

Work Order Summary

CLIENT:	Ms. Shane Lowe CH2M Hill 300 Hunter Ave Suite 305 St. Louis, MO 63124	**BILL TO:**	Ms. Shane Lowe CH2M Hill 300 Hunter Ave Suite 305 St. Louis, MO 63124
PHONE:	(314)-421-0900	**P.O. #**	PN 703765CH.01.04
FAX:		**PROJECT #**	703765CH.01.03 Essex - Hope
DATE RECEIVED:	11/19/2018	**CONTACT:**	Brian Whittaker
DATE COMPLETED:	12/11/2018		
DATE REISSUED:	12/12/2018		

FRACTION #	NAME	TEST
01A	WMS-SE-01	Passive S.E. WMS
02A	WMS-SE-02	Passive S.E. WMS
03A	WMS-SE-03	Passive S.E. WMS
04A	WMS-SE-04	Passive S.E. WMS
05A	WMS-SE-05	Passive S.E. WMS
06A	WMS-SE-06	Passive S.E. WMS
07A	TB-111618	Passive S.E. WMS
08A	Lab Blank	Passive S.E. WMS
09A	LCS	Passive S.E. WMS
09AA	LCSD	Passive S.E. WMS

CERTIFIED BY: Heidi Hayes

Technical Director

DATE: 12/12/18

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics LLC.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
WMS Passive SE by Mod EPA TO-17
CH2M Hill
Workorder# 1811372R1

Seven WMS-SE samples were received on November 19, 2018. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

Please note that 1,1,2,2-Tetrachloroethane (1,1,2,2-PCA) can degrade into Trichloroethene (TCE) during storage on the charcoal-based sorbent used in the WMS device. Samples containing 1,1,2,2-PCA may yield reduced concentrations of 1,1,2,2-PCA and elevated concentrations of TCE.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

Requirement	***TO-17***	***ATL Modifications***
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

To calculate ug/m3 concentrations in the Lab Blank and Trip Blank, a sampling duration of 5468 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

The workorder was reissued on 12/12/2018 to report estimated values for target compound hits that are below the reporting limit but greater than the method detection limit.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

C - Estimated concentration due to calculated sampling rate

CN - See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

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Summary of Detected Compounds
VOC BY PASSIVE SAMPLER - GC/MS

Client Sample ID: WMS-SE-01

Lab ID#: 1811372R1-01A

No Detections Were Found.

Client Sample ID: WMS-SE-02

Lab ID#: 1811372R1-02A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
cis-1,2-Dichloroethene	0.050	4.8	1.4	140
Trichloroethene	0.050	3.5	1.3	94
Tetrachloroethene	0.050	2.3	0.020 J	0.94 J

Client Sample ID: WMS-SE-03

Lab ID#: 1811372R1-03A

No Detections Were Found.

Client Sample ID: WMS-SE-04

Lab ID#: 1811372R1-04A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
cis-1,2-Dichloroethene	0.050	4.8	0.26	25
Trichloroethene	0.050	3.6	0.36	26

Client Sample ID: WMS-SE-05

Lab ID#: 1811372R1-05A

No Detections Were Found.

Client Sample ID: WMS-SE-06

Lab ID#: 1811372R1-06A

No Detections Were Found.

Client Sample ID: TB-111618

Lab ID#: 1811372R1-07A

No Detections Were Found.

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Client Sample ID: WMS-SE-01

Lab ID#: 1811372R1-01A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121113simr1**	**Date of Collection: 11/16/18 10:08:00 A**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 12:17 PM**	
		Date of Extraction: 12/11/18	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	30	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	11	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.8	Not Detected	Not Detected
Trichloroethene	0.050	3.5	Not Detected	Not Detected
Tetrachloroethene	0.050	2.3	Not Detected	Not Detected

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5468 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	111	70-130

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Client Sample ID: WMS-SE-02

Lab ID#: 1811372R1-02A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121114simr1**	**Date of Collection: 11/16/18 10:10:00 A**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 12:39 PM**	
		Date of Extraction: 12/11/18	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	30	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	11	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.8	1.4	140
Trichloroethene	0.050	3.5	1.3	94
Tetrachloroethene	0.050	2.3	0.020 J	0.94 J

J = Estimated value.

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5465 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	111	70-130

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Client Sample ID: WMS-SE-03

Lab ID#: 1811372R1-03A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121115simr1**	**Date of Collection: 11/16/18 10:16:00 A**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 01:01 PM**	
		Date of Extraction: 12/11/18	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	31	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	11	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.8	Not Detected	Not Detected
Trichloroethene	0.050	3.5	Not Detected	Not Detected
Tetrachloroethene	0.050	2.4	Not Detected	Not Detected

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5441 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	113	70-130

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Client Sample ID: WMS-SE-04

Lab ID#: 1811372R1-04A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121116simr1**	**Date of Collection: 11/16/18 10:17:00 A**
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 01:24 PM**
		Date of Extraction: 12/11/18

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	31	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	12	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.8	0.26	25
Trichloroethene	0.050	3.6	0.36	26
Tetrachloroethene	0.050	2.4	Not Detected	Not Detected

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5417 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	111	70-130

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Client Sample ID: WMS-SE-05

Lab ID#: 1811372R1-05A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121117simr1**	**Date of Collection: 11/16/18 10:03:00 A**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 01:46 PM**	
		Date of Extraction: 12/11/18	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	31	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	12	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.9	Not Detected	Not Detected
Trichloroethene	0.050	3.6	Not Detected	Not Detected
Tetrachloroethene	0.050	2.4	Not Detected	Not Detected

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5371 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	113	70-130

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Client Sample ID: WMS-SE-06

Lab ID#: 1811372R1-06A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121118simr1**	**Date of Collection: 11/16/18 9:58:00 AM**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 02:09 PM**	
		Date of Extraction: 12/11/18	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	31	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	12	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.9	Not Detected	Not Detected
Trichloroethene	0.050	3.6	Not Detected	Not Detected
Tetrachloroethene	0.050	2.4	Not Detected	Not Detected

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5373 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	110	70-130

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Client Sample ID: TB-111618

Lab ID#: 1811372R1-07A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121112simr1**	**Date of Collection: 11/16/18**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 11:54 AM**	
		Date of Extraction: 12/11/18	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	30	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	11	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.8	Not Detected	Not Detected
Trichloroethene	0.050	3.5	Not Detected	Not Detected
Tetrachloroethene	0.050	2.3	Not Detected	Not Detected

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5468 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	113	70-130

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Client Sample ID: Lab Blank

Lab ID#: 1811372R1-08A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121110simr1**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 11:07 AM**	
		Date of Extraction: 12/11/18	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Vinyl Chloride	0.20	30	Not Detected	Not Detected
1,1-Dichloroethene	0.20	26	Not Detected	Not Detected
trans-1,2-Dichloroethene	0.10	11	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.050	4.8	Not Detected	Not Detected
Trichloroethene	0.050	3.5	Not Detected	Not Detected
Tetrachloroethene	0.050	2.3	Not Detected	Not Detected

Results of ND are equal to a "U" qualifier flag and were Not Detected at the RL.
Temperature = 77.0F , duration time = 5468 minutes.
Container Type: WMS-SE

Surrogates	%Recovery	Method Limits
Toluene-d8	112	70-130

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Client Sample ID: LCS

Lab ID#: 1811372R1-09A

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121108sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 10:22 AM**	
		Date of Extraction: 12/11/18	

Compound	%Recovery	Method Limits
Vinyl Chloride	100	50-140
1,1-Dichloroethene	129	70-130
trans-1,2-Dichloroethene	116	70-130
cis-1,2-Dichloroethene	107	70-130
Trichloroethene	115	70-130
Tetrachloroethene	107	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	111	70-130

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Client Sample ID: LCSD

Lab ID#: 1811372R1-09AA

VOC BY PASSIVE SAMPLER - GC/MS

File Name:	**9121109sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 12/11/18 10:45 AM**	
		Date of Extraction: 12/11/18	

Compound	%Recovery	Method Limits
Vinyl Chloride	112	50-140
1,1-Dichloroethene	129	70-130
trans-1,2-Dichloroethene	113	70-130
cis-1,2-Dichloroethene	107	70-130
Trichloroethene	115	70-130
Tetrachloroethene	108	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	110	70-130

ANALYTICAL REPORT

Lab Number:	L1847517
Client:	Jacobs 18 Tremont Street Suite 700 Boston, MA 02108
ATTN:	Kyle Block
Phone:	(617) 523-2260
Project Name:	ESSEX/HOP
Project Number:	703765CH.01.03
Report Date:	12/05/18

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Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), 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 #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1847517-01	JMF-01-20181114	SOIL_VAPOR	JAMESTOWN, NY	11/14/18 19:53	11/19/18
L1847517-02	JMF-01-20181114-FD	SOIL_VAPOR	JAMESTOWN, NY	11/14/18 19:53	11/19/18
L1847517-03	JMF-02-20181114	SOIL_VAPOR	JAMESTOWN, NY	11/14/18 17:03	11/19/18
L1847517-04	JMF-03-20181114	SOIL_VAPOR	JAMESTOWN, NY	11/14/18 19:09	11/19/18
L1847517-05	JMF-04-20181114	SOIL_VAPOR	JAMESTOWN, NY	11/14/18 17:37	11/19/18
L1847517-06	HH-01-20181115	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 09:51	11/19/18
L1847517-07	HH-02-20181115	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 10:17	11/19/18
L1847517-08	HH-03-20181115	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 11:34	11/19/18
L1847517-09	HH-04-20181115	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 12:32	11/19/18
L1847517-10	HH-04-20181115-FD	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 12:32	11/19/18
L1847517-11	HH-05-20181115	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 14:33	11/19/18
L1847517-12	HH-06-20181115	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 15:24	11/19/18
L1847517-13	HH-07-20181115	SOIL_VAPOR	JAMESTOWN, NY	11/15/18 16:14	11/19/18

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

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: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

Case Narrative (continued)

Volatile Organics in Air

Canisters were released from the laboratory on November 7, 2018. The canister certification results are provided as an addendum.

L1847517-01 through -13: Prior to sample analysis, the canisters were pressurized with UHP Nitrogen due to canister size. The pressurization resulted in a dilution of the samples. The reporting limits have been elevated accordingly.

L1847517-12: The sample has elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the sample.

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: 12/05/18

AIR

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-01 D
Client ID: JMF-01-20181114
Sample Location: JAMESTOWN, NY

Date Collected: 11/14/18 19:53
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 17:03
Analyst: EW

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								
Vinyl chloride	ND	0.496	--	ND	1.27	--		2.479
1,1-Dichloroethene	ND	0.496	--	ND	1.97	--		2.479
trans-1,2-Dichloroethene	ND	0.496	--	ND	1.97	--		2.479
cis-1,2-Dichloroethene	1.71	0.496	--	6.78	1.97	--		2.479
Trichloroethene	3.31	0.496	--	17.8	2.67	--		2.479
Tetrachloroethene	1.54	0.496	--	10.4	3.36	--		2.479

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	105		60-140
Bromochloromethane	106		60-140
chlorobenzene-d5	107		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-02 D
Client ID: JMF-01-20181114-FD
Sample Location: JAMESTOWN, NY

Date Collected: 11/14/18 19:53
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 17:43
Analyst: EW

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								
Vinyl chloride	ND	0.493	--	ND	1.26	--		2.467
1,1-Dichloroethene	ND	0.493	--	ND	1.95	--		2.467
trans-1,2-Dichloroethene	ND	0.493	--	ND	1.95	--		2.467
cis-1,2-Dichloroethene	1.57	0.493	--	6.22	1.95	--		2.467
Trichloroethene	3.26	0.493	--	17.5	2.65	--		2.467
Tetrachloroethene	1.46	0.493	--	9.90	3.34	--		2.467

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	104		60-140
Bromochloromethane	103		60-140
chlorobenzene-d5	106		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-03 D
Client ID: JMF-02-20181114
Sample Location: JAMESTOWN, NY

Date Collected: 11/14/18 17:03
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 19:02
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.432	--	ND	1.10	--		2.161
1,1-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
trans-1,2-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
cis-1,2-Dichloroethene	1.11	0.432	--	4.40	1.71	--		2.161
Trichloroethene	2.41	0.432	--	13.0	2.32	--		2.161
Tetrachloroethene	ND	0.432	--	ND	2.93	--		2.161

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	102		60-140
Bromochloromethane	102		60-140
chlorobenzene-d5	105		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-04 D
Client ID: JMF-03-20181114
Sample Location: JAMESTOWN, NY

Date Collected: 11/14/18 19:09
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 19:41
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.459	--	ND	1.17	--		2.297
1,1-Dichloroethene	ND	0.459	--	ND	1.82	--		2.297
trans-1,2-Dichloroethene	ND	0.459	--	ND	1.82	--		2.297
cis-1,2-Dichloroethene	2.82	0.459	--	11.2	1.82	--		2.297
Trichloroethene	4.30	0.459	--	23.1	2.47	--		2.297
Tetrachloroethene	1.28	0.459	--	8.68	3.11	--		2.297

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	103		60-140
Bromochloromethane	102		60-140
chlorobenzene-d5	105		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-05 D
Client ID: JMF-04-20181114
Sample Location: JAMESTOWN, NY

Date Collected: 11/14/18 17:37
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 20:21
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.454	--	ND	1.16	--		2.269
1,1-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
trans-1,2-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
cis-1,2-Dichloroethene	2.13	0.454	--	8.45	1.80	--		2.269
Trichloroethene	4.00	0.454	--	21.5	2.44	--		2.269
Tetrachloroethene	2.20	0.454	--	14.9	3.08	--		2.269

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	102		60-140
Bromochloromethane	102		60-140
chlorobenzene-d5	104		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-06 D
Client ID: HH-01-20181115
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 09:51
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 21:00
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.447	--	ND	1.14	--		2.233
1,1-Dichloroethene	ND	0.447	--	ND	1.77	--		2.233
trans-1,2-Dichloroethene	ND	0.447	--	ND	1.77	--		2.233
cis-1,2-Dichloroethene	2.98	0.447	--	11.8	1.77	--		2.233
Trichloroethene	6.14	0.447	--	33.0	2.40	--		2.233
Tetrachloroethene	3.60	0.447	--	24.4	3.03	--		2.233

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	102		60-140
Bromochloromethane	101		60-140
chlorobenzene-d5	104		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-07 D
Client ID: HH-02-20181115
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 10:17
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 21:39
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.437	--	ND	1.12	--		2.185
1,1-Dichloroethene	ND	0.437	--	ND	1.73	--		2.185
trans-1,2-Dichloroethene	ND	0.437	--	ND	1.73	--		2.185
cis-1,2-Dichloroethene	1.74	0.437	--	6.90	1.73	--		2.185
Trichloroethene	3.10	0.437	--	16.7	2.35	--		2.185
Tetrachloroethene	6.41	0.437	--	43.5	2.96	--		2.185

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	101		60-140
Bromochloromethane	100		60-140
chlorobenzene-d5	104		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-08 D
Client ID: HH-03-20181115
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 11:34
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 22:19
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.432	--	ND	1.10	--		2.161
1,1-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
trans-1,2-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
cis-1,2-Dichloroethene	1.85	0.432	--	7.33	1.71	--		2.161
Trichloroethene	4.30	0.432	--	23.1	2.32	--		2.161
Tetrachloroethene	ND	0.432	--	ND	2.93	--		2.161

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	103		60-140
Bromochloromethane	101		60-140
chlorobenzene-d5	104		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-09 D
Client ID: HH-04-20181115
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 12:32
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 22:58
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.487	--	ND	1.24	--		2.435
1,1-Dichloroethene	ND	0.487	--	ND	1.93	--		2.435
trans-1,2-Dichloroethene	ND	0.487	--	ND	1.93	--		2.435
cis-1,2-Dichloroethene	1.25	0.487	--	4.96	1.93	--		2.435
Trichloroethene	2.69	0.487	--	14.5	2.62	--		2.435
Tetrachloroethene	15.1	0.487	--	102	3.30	--		2.435

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	101		60-140
Bromochloromethane	100		60-140
chlorobenzene-d5	103		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-10 D
Client ID: HH-04-20181115-FD
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 12:32
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 23:38
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.480	--	ND	1.23	--		2.398
1,1-Dichloroethene	ND	0.480	--	ND	1.90	--		2.398
trans-1,2-Dichloroethene	ND	0.480	--	ND	1.90	--		2.398
cis-1,2-Dichloroethene	1.17	0.480	--	4.64	1.90	--		2.398
Trichloroethene	2.60	0.480	--	14.0	2.58	--		2.398
Tetrachloroethene	14.9	0.480	--	101	3.25	--		2.398

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	102		60-140
Bromochloromethane	101		60-140
chlorobenzene-d5	105		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-11 D
Client ID: HH-05-20181115
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 14:33
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/04/18 00:17
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.449	--	ND	1.15	--		2.244
1,1-Dichloroethene	ND	0.449	--	ND	1.78	--		2.244
trans-1,2-Dichloroethene	ND	0.449	--	ND	1.78	--		2.244
cis-1,2-Dichloroethene	0.554	0.449	--	2.20	1.78	--		2.244
Trichloroethene	3.17	0.449	--	17.0	2.41	--		2.244
Tetrachloroethene	4.61	0.449	--	31.3	3.04	--		2.244

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	101		60-140
Bromochloromethane	100		60-140
chlorobenzene-d5	105		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-12 D
Client ID: HH-06-20181115
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 15:24
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/04/18 00:54
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.890	--	ND	2.28	--		4.451
1,1-Dichloroethene	ND	0.890	--	ND	3.53	--		4.451
trans-1,2-Dichloroethene	ND	0.890	--	ND	3.53	--		4.451
cis-1,2-Dichloroethene	6.56	0.890	--	26.0	3.53	--		4.451
Trichloroethene	246	0.890	--	1320	4.78	--		4.451
Tetrachloroethene	1.46	0.890	--	9.90	6.04	--		4.451

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	102		60-140
Bromochloromethane	100		60-140
chlorobenzene-d5	105		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

SAMPLE RESULTS

Lab ID: L1847517-13 D
Client ID: HH-07-20181115
Sample Location: JAMESTOWN, NY

Date Collected: 11/15/18 16:14
Date Received: 11/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/04/18 01:34
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.424	--	ND	1.08	--		2.122
1,1-Dichloroethene	ND	0.424	--	ND	1.68	--		2.122
trans-1,2-Dichloroethene	ND	0.424	--	ND	1.68	--		2.122
cis-1,2-Dichloroethene	1.76	0.424	--	6.98	1.68	--		2.122
Trichloroethene	88.0	0.424	--	473	2.28	--		2.122
Tetrachloroethene	0.675	0.424	--	4.58	2.88	--		2.122

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	102		60-140
Bromochloromethane	100		60-140
chlorobenzene-d5	105		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03
Lab Number: L1847517
Report Date: 12/05/18

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/03/18 15:04

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): 01-13 Batch: WG1185068-4								
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1

Lab Control Sample Analysis

Batch Quality Control

Project Name: ESSEX/HOP

Project Number: 703765CH.01.03

Lab Number: L1847517

Report Date: 12/05/18

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-13 Batch: WG1185068-3								
Vinyl chloride	82		-		70-130	-		
1,1-Dichloroethene	118		-		70-130	-		
trans-1,2-Dichloroethene	119		-		70-130	-		
cis-1,2-Dichloroethene	124		-		70-130	-		
Trichloroethene	110		-		70-130	-		
Tetrachloroethene	128		-		70-130	-		

Lab Duplicate Analysis
Batch Quality Control

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-13 QC Batch ID: WG1185068-5 QC Sample: L1847517-02 Client ID: JMF-01-20181114-FD						
Vinyl chloride	ND	ND	ppbV	NC		25
1,1-Dichloroethene	ND	ND	ppbV	NC		25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC		25
cis-1,2-Dichloroethene	1.57	1.48	ppbV	6		25
Trichloroethene	3.26	3.15	ppbV	3		25
Tetrachloroethene	1.46	1.41	ppbV	3		25

Project Name: ESSEX/HOP

Project Number: 703765CH.01.03

Lab Number: L1847517

Report Date: 12/05/18

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
L1847517-01	JMF-01-20181114	2499	1.0L Can	11/07/18	277167	L1842636-02	Pass	-29.7	-4.9	-	-	-	-
L1847517-02	JMF-01-20181114-FD	0523	SV200	11/07/18	277167		-	-	-	Pass	226	226	0
L1847517-02	JMF-01-20181114-FD	2529	1.0L Can	11/07/18	277167	L1839361-04	Pass	-29.6	-4.7	-	-	-	-
L1847517-03	JMF-02-20181114	0654	SV200	11/07/18	277167		-	-	-	Pass	227	209	8
L1847517-03	JMF-02-20181114	1502	1.0L Can	11/07/18	277167	L1838497-02	Pass	-29.4	-1.5	-	-	-	-
L1847517-04	JMF-03-20181114	0688	SV200	11/07/18	277167		-	-	-	Pass	230	212	8
L1847517-04	JMF-03-20181114	2557	1.0L Can	11/07/18	277167	L1835794-02	Pass	-30.0	-2.8	-	-	-	-
L1847517-05	JMF-04-20181114	0991	SV200	11/07/18	277167		-	-	-	Pass	227	203	11
L1847517-05	JMF-04-20181114	716	1.0L Can	11/07/18	277167	L1840402-01	Pass	-29.7	-2.3	-	-	-	-
L1847517-06	HH-01-20181115	0852	SV200	11/07/18	277167		-	-	-	Pass	230	208	10
L1847517-06	HH-01-20181115	800	1.0L Can	11/07/18	277167	L1843299-02	Pass	-29.5	-1.7	-	-	-	-
L1847517-07	HH-02-20181115	0670	SV200	11/07/18	277167		-	-	-	Pass	230	207	11
L1847517-07	HH-02-20181115	721	1.0L Can	11/07/18	277167	L1844397-02	Pass	-29.4	-1.4	-	-	-	-
L1847517-08	HH-03-20181115	0652	SV200	11/07/18	277167		-	-	-	Pass	228	207	10
L1847517-08	HH-03-20181115	824	1.0L Can	11/07/18	277167	L1844032-01	Pass	-29.6	-1.0	-	-	-	-

Project Name: ESSEX/HOP

Lab Number: L1847517

Project Number: 703765CH.01.03

Report Date: 12/05/18

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
L1847517-09	HH-04-20181115	2157	1.0L Can	11/07/18	277167	L1840402-01	Pass	-29.5	-4.2	-	-	-	-
L1847517-10	HH-04-20181115-FD	01051	SV200	11/07/18	277167		-	-	-	Pass	225	225	0
L1847517-10	HH-04-20181115-FD	2162	1.0L Can	11/07/18	277167	L1838227-02	Pass	-29.4	-4.1	-	-	-	-
L1847517-11	HH-05-20181115	0653	SV200	11/07/18	277167		-	-	-	Pass	220	200	10
L1847517-11	HH-05-20181115	2175	1.0L Can	11/07/18	277167	L1840402-01	Pass	-29.9	-2.0	-	-	-	-
L1847517-12	HH-06-20181115	0668	SV200	11/07/18	277167		-	-	-	Pass	227	211	7
L1847517-12	HH-06-20181115	848	1.0L Can	11/07/18	277167	L1835794-02	Pass	-29.7	-1.7	-	-	-	-
L1847517-13	HH-07-20181115	0666	SV200	11/07/18	277167		-	-	-	Pass	227	211	7
L1847517-13	HH-07-20181115	2532	1.0L Can	11/07/18	277167	L1840402-01	Pass	-29.9	-0.63	-	-	-	-

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1835794
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 09/13/18 00:30
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1835794
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:

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								
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
Trichloroethene	ND	0.200	--	ND	1.07	--		1

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1835794
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:

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								
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: L1835794
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:

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								
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 **Lab Number:** L1835794

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:

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	95		60-140
Bromochloromethane	95		60-140
chlorobenzene-d5	93		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1835794

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 09/13/18 00:30
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1835794
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1835794
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1835794-02
Client ID: CAN 2089 SHELF 17
Sample Location:

Date Collected: 09/10/18 16:00
Date Received: 09/11/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	88		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1838227

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 09/27/18 21:46
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1838227

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838227
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838227
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1838227
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					
Cyclotrisiloxane, Hexamethyl-	1.3	NJ	ppbV		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	94		60-140
Bromochloromethane	97		60-140
chlorobenzene-d5	93		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838227
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 09/27/18 21:46
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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	--	J	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: L1838227
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838227
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838227-02
Client ID: CAN 2162 SHELF 11
Sample Location:

Date Collected: 09/24/18 16:00
Date Received: 09/25/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	93		60-140
bromochloromethane	97		60-140
chlorobenzene-d5	94		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1838497
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 09/27/18 23:04
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1838497
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838497
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838497
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838497
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	93		60-140
Bromochloromethane	97		60-140
chlorobenzene-d5	91		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838497
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 09/27/18 23:04
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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 **Lab Number:** L1838497

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:

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								
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	--	J	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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1838497
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1838497-02
Client ID: CAN 1502 SHELF 20
Sample Location:

Date Collected: 09/25/18 16:00
Date Received: 09/26/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	--	J	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	93		60-140
bromochloromethane	97		60-140
chlorobenzene-d5	92		60-140

Project Name: INDIV. CANISTER CERTIFICATION
Project Number: CANISTER QC INDIV

Lab Number: L1839361
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/02/18 22:01
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: INDIV. CANISTER CERTIFICATION
Project Number: CANISTER QC INDIV

Lab Number: L1839361
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: INDIV. CANISTER CERTIFICATION **Lab Number:** L1839361

Project Number: CANISTER QC INDIV **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: INDIV. CANISTER CERTIFICATION
Project Number: CANISTER QC INDIV

Lab Number: L1839361
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: INDIV. CANISTER CERTIFICATION **Lab Number:** L1839361

Project Number: CANISTER QC INDIV **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	83		60-140
Bromochloromethane	85		60-140
chlorobenzene-d5	83		60-140

Project Name: INDIV. CANISTER CERTIFICATION **Lab Number:** L1839361

Project Number: CANISTER QC INDIV **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 10/02/18 22:01
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.500	--	ND	0.500	--		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	2.00	--	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
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	--	J	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: INDIV. CANISTER CERTIFICATION **Lab Number:** L1839361

Project Number: CANISTER QC INDIV **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:

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								
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	0.500	--	ND	0.983	--		1
1,3,5-Trimethybenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.500	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.500	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1

Project Name: INDIV. CANISTER CERTIFICATION
Project Number: CANISTER QC INDIV

Lab Number: L1839361
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1839361-04
Client ID: CAN 2529
Sample Location:

Date Collected: 09/30/18 12:00
Date Received: 10/01/18
Field Prep: Not Specified

Sample Depth:

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								
n-Butylbenzene	ND	0.500	--	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	92		60-140
chlorobenzene-d5	88		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1840402
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/05/18 20:50
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1840402
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1840402
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1840402
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1840402
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	91		60-140
Bromochloromethane	94		60-140
chlorobenzene-d5	87		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1840402

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 10/05/18 20:50
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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 **Lab Number:** L1840402

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:

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								
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	--	J	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	0.043	0.020	--	0.292	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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1840402
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1840402-01
Client ID: CAN 716 SHELF 14
Sample Location:

Date Collected: 10/05/18 09:00
Date Received: 10/05/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	93		60-140
bromochloromethane	95		60-140
chlorobenzene-d5	92		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1842636
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/19/18 20:36
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1842636
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1842636

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1842636
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1842636
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	91		60-140
Bromochloromethane	96		60-140
chlorobenzene-d5	88		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1842636

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 10/19/18 20:36
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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	--	J	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: L1842636
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1842636
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1842636-02
Client ID: CAN 2499 SHELF 15
Sample Location:

Date Collected: 10/18/18 16:00
Date Received: 10/19/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	93		60-140
bromochloromethane	96		60-140
chlorobenzene-d5	88		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/24/18 19:22
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

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: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 10/24/18 19:22
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1843299
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1843299-02
Client ID: CAN 800 SHELF 9
Sample Location:

Date Collected: 10/23/18 16:00
Date Received: 10/24/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	94		60-140
chlorobenzene-d5	93		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/30/18 20:43
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	92		60-140
Bromochloromethane	98		60-140
chlorobenzene-d5	86		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 10/30/18 20:43
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1844032
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844032-01
Client ID: CAN 824 SHELF 10
Sample Location:

Date Collected: 10/26/18 16:00
Date Received: 10/29/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	95		60-140
chlorobenzene-d5	87		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1844397
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/31/18 21:50
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1844397
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1844397
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1844397
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1844397
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	83		60-140
Bromochloromethane	90		60-140
chlorobenzene-d5	88		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1844397

Project Number: CANISTER QC BAT **Report Date:** 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 10/31/18 21:50
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1844397
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1844397
Report Date: 12/05/18

Air Canister Certification Results

Lab ID: L1844397-02
Client ID: CAN 721 SHELF 15
Sample Location:

Date Collected: 10/30/18 16:00
Date Received: 10/31/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	86		60-140
bromochloromethane	94		60-140
chlorobenzene-d5	91		60-140

Project Name: ESSEX/HOP
Project Number: 703765CH.01.03

Lab Number: L1847517
Report Date: 12/05/18

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
N/A	Present/Intact

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1847517-01A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-02A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-03A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-04A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-05A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-06A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-07A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-08A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-09A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-10A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-11A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-12A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)
L1847517-13A	Canister - 1 Liter	N/A	NA			Y	Present/Intact		TO15-LL(30)

*Values in parentheses indicate holding time in days

Project Name:	ESSEX/HOP	**Lab Number:**	L1847517
Project Number:	703765CH.01.03	**Report Date:**	12/05/18

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).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
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.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
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.

Report Format: Data Usability Report

Project Name:	ESSEX/HOP	**Lab Number:**	L1847517
Project Number:	703765CH.01.03	**Report Date:**	12/05/18

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 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

Project Name:	ESSEX/HOP	**Lab Number:**	L1847517
Project Number:	703765CH.01.03	**Report Date:**	12/05/18

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 624/624.1: 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 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
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: Chloride, 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: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, 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 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: 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 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

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, Fe, Pb, Mn, Ni, K, Se, Ag, Na, 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 2

CHAIN OF CUSTODY

320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 11/19/18

ALPHA Job #: L1847517

Client Information

Client: Jacobs / CH2M
Address: 18 Tremont Street
Boston, MA
Phone: 617-963-3129
Fax:
Email: Kyle.Block@Jacobs.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Essex / Hope
Project Location: Jamestown, NY
Project #: 703765CH.01.03
Project Manager: Kyle Block
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
14-Day
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 #:
See PO

Regulatory Requirements/Report Limits

State/Fed	Program	Res / Comm

Other Project Specific Requirements/Comments:

Project-Specific Target Compound List: ☐

ANALYSIS

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	I D Can	I D - Flow Controller	TO-15	TO-15 SIM	APH (Subset Non-petroleum HCs ☐)	Fixed Gases	Sulfides & Mercaptans by TO-15	Sample Comments (i.e. PID)
47517.01	JMF-01_20181114	11/14/18	1946	1953	-28.67	-5.01	SV	AS	1L	2499	0523	X					
-02	JMF-01_20181114-FD	11/14/18	1946	1953	-28.68	-4.88	SV	AS	1L	2529	0523	X					
-03	JMF-02_20181114	11/14/18	1658	1703	-28.41	-1.67	SV	AS	1L	1502	0654	X					
-04	JMF-03_20181114	11/14/18	1904	1909	-28.64	-2.83	SV	AS	1L	2557	0688	X					
-05	JMF-04_20181114	11/14/18	1732	1737	-28.78	-2.03	SV	AS	1L	716	0991	X					
-06	HH-01_20181115	11/15/18	0946	0951	-29.10	-2.19	SV	AS	1L	800	0852	X					
-07	HH-02_20181115	11/15/18	1013	1017	-28.69	-1.76	SV	AS	1L	721	0670	X					
-08	HH-03_20181115	11/15/18	1129	1134	-28.61	-1.73	SV	AS	1L	824	0652	X					
-09	HH-04_20181115	11/15/18	1225	1232	-29.09	-4.69	SV	AS	1L	2157	01051	X					
-10	HH-04_20181115-FD	11/15/18	1225	1232	-28.47	-4.60	SV	AS	1L	2162	01051	X					

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

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:
	11/15/18 1200	FedEx	11/19/18 9:52

AIR ANALYSIS

PAGE 2 OF 2

ALPHA ANALYTICAL — CHAIN OF CUSTODY

320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 11/19/18

ALPHA Job #: L1847517

Client Information

Client: Jacobs / CH2M
Address: 18 Tremont Street
Boston, MA
Phone: 617-963-3129
Fax:
Email: Kyle.Block@Jacobs.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Essex-Hope
Project Location: Jamestown, NY
Project #: 703765CH.01.03
Project Manager: Kyle Block
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
14-DAY
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 #:
See 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	I D Can	I D - Flow Controller	TO-15	TO-15 SIM	APH (Subject Non-petroleum HCs ☐)	Fixed Gases	Sulfides & Mercaptans by TO-15	Sample Comments (i.e. PID)
-11	HH-05_20181115	11/15/18	1428	1433	-29.17	-2.69	SV	AS	1L	2175	0653	X					
-12	HH-06_20181115	11/15/18	1519	1524	-28.42	-2.24	SV	AS	1L	849	0668	X					
-13	HH-07_20181115	11/15/18	1609	1614	-29.13	-1.30	SV	AS	1L	2532	0666	X					

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

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:
[signature]	11/15/18 1200	FedEx [signature]	11/19/18 9:32

Form No: 101-02 Rev: (25-Sep-15)

ANALYTICAL REPORT

Lab Number:	L1851659
Client:	Jacobs 18 Tremont Street Suite 700 Boston, MA 02108
ATTN:	Kyle Block
Phone:	(617) 523-2260
Project Name:	ESSEX/HOPE
Project Number:	703765CH.01.03
Report Date:	01/02/19

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), 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 #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03

Lab Number: L1851659
Report Date: 01/02/19

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1851659-01	SV-01_20181211	SOIL_VAPOR	JAMESTOWN, NY	12/11/18 17:34	12/13/18
L1851659-02	SV-02_20181211	SOIL_VAPOR	JAMESTOWN, NY	12/11/18 16:05	12/13/18
L1851659-03	SV-03_20181211	SOIL_VAPOR	JAMESTOWN, NY	12/11/18 15:22	12/13/18
L1851659-04	SV-04_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 09:33	12/13/18
L1851659-05	SV-05_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 10:59	12/13/18
L1851659-06	SV-06_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 10:07	12/13/18
L1851659-07	SV-07_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 13:21	12/13/18
L1851659-08	SV-07_20181212-FD	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 13:21	12/13/18
L1851659-09	SV-08_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 14:37	12/13/18
L1851659-10	SV-09_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 13:59	12/13/18
L1851659-11	SV-10_20181213	SOIL_VAPOR	JAMESTOWN, NY	12/13/18 12:17	12/13/18
L1851659-12	SV-10_20181213-FD	SOIL_VAPOR	JAMESTOWN, NY	12/13/18 12:17	12/13/18
L1851659-13	SV-11_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 15:13	12/13/18
L1851659-14	SV-12_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 15:50	12/13/18
L1851659-15	SV-13_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/12/18 16:33	12/13/18
L1851659-16	SV-14_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/13/18 10:31	12/13/18
L1851659-17	SV-15_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/13/18 11:37	12/13/18
L1851659-18	SV-16_20181212	SOIL_VAPOR	JAMESTOWN, NY	12/13/18 11:04	12/13/18

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03

Lab Number: L1851659
Report Date: 01/02/19

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: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

Case Narrative (continued)

Volatile Organics in Air

Canisters were released from the laboratory on December 10, 2018. The canister certification results are provided as an addendum.

L1851659-17 & -18: Prior to sample analysis, the canisters were pressurized with UHP Nitrogen due to canister size. The pressurization resulted in a dilution of the samples. The reporting limits have been elevated accordingly.

WG1193633-5: Prior to sample analysis, the canisters were pressurized with UHP Nitrogen due to canister size. The pressurization resulted in a dilution of the sample. The reporting limits have been elevated accordingly.

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: 01/02/19

AIR

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-01 D
Client ID: SV-01_20181211
Sample Location: JAMESTOWN, NY

Date Collected: 12/11/18 17:34
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 15:50
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.454	--	ND	1.16	--		2.269
1,1-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
trans-1,2-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
cis-1,2-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
Trichloroethene	48.8	0.454	--	262	2.44	--		2.269
Tetrachloroethene	2.39	0.454	--	16.2	3.08	--		2.269

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	101		60-140
Bromochloromethane	102		60-140
chlorobenzene-d5	96		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-02 D
Client ID: SV-02_20181211
Sample Location: JAMESTOWN, NY

Date Collected: 12/11/18 16:05
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 16:25
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.438	--	ND	1.12	--		2.193
1,1-Dichloroethene	ND	0.438	--	ND	1.74	--		2.193
trans-1,2-Dichloroethene	ND	0.438	--	ND	1.74	--		2.193
cis-1,2-Dichloroethene	ND	0.438	--	ND	1.74	--		2.193
Trichloroethene	ND	0.438	--	ND	2.35	--		2.193
Tetrachloroethene	2.31	0.438	--	15.7	2.97	--		2.193

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	91		60-140
Bromochloromethane	93		60-140
chlorobenzene-d5	89		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-03 D
Client ID: SV-03_20181211
Sample Location: JAMESTOWN, NY

Date Collected: 12/11/18 15:22
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 17:34
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.455	--	ND	1.16	--		2.277
1,1-Dichloroethene	ND	0.455	--	ND	1.80	--		2.277
trans-1,2-Dichloroethene	ND	0.455	--	ND	1.80	--		2.277
cis-1,2-Dichloroethene	ND	0.455	--	ND	1.80	--		2.277
Trichloroethene	ND	0.455	--	ND	2.45	--		2.277
Tetrachloroethene	57.5	0.455	--	390	3.09	--		2.277

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	88		60-140
Bromochloromethane	89		60-140
chlorobenzene-d5	88		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-04 D
Client ID: SV-04_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 09:33
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 18:09
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.444	--	ND	1.13	--		2.218
1,1-Dichloroethene	ND	0.444	--	ND	1.76	--		2.218
trans-1,2-Dichloroethene	ND	0.444	--	ND	1.76	--		2.218
cis-1,2-Dichloroethene	ND	0.444	--	ND	1.76	--		2.218
Trichloroethene	0.608	0.444	--	3.27	2.39	--		2.218
Tetrachloroethene	ND	0.444	--	ND	3.01	--		2.218

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	88		60-140
Bromochloromethane	91		60-140
chlorobenzene-d5	87		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-05 D
Client ID: SV-05_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 10:59
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 18:43
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.421	--	ND	1.08	--		2.106
1,1-Dichloroethene	ND	0.421	--	ND	1.67	--		2.106
trans-1,2-Dichloroethene	ND	0.421	--	ND	1.67	--		2.106
cis-1,2-Dichloroethene	ND	0.421	--	ND	1.67	--		2.106
Trichloroethene	ND	0.421	--	ND	2.26	--		2.106
Tetrachloroethene	2.40	0.421	--	16.3	2.85	--		2.106

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	89		60-140
Bromochloromethane	89		60-140
chlorobenzene-d5	85		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-06 D
Client ID: SV-06_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 10:07
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 19:17
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.435	--	ND	1.11	--		2.177
1,1-Dichloroethene	0.638	0.435	--	2.53	1.72	--		2.177
trans-1,2-Dichloroethene	ND	0.435	--	ND	1.72	--		2.177
cis-1,2-Dichloroethene	ND	0.435	--	ND	1.72	--		2.177
Trichloroethene	8.21	0.435	--	44.1	2.34	--		2.177
Tetrachloroethene	1.04	0.435	--	7.05	2.95	--		2.177

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	88		60-140
Bromochloromethane	88		60-140
chlorobenzene-d5	87		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-07 D
Client ID: SV-07_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 13:21
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 19:51
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	0.877	0.452	--	2.24	1.16	--		2.26
1,1-Dichloroethene	ND	0.452	--	ND	1.79	--		2.26
trans-1,2-Dichloroethene	ND	0.452	--	ND	1.79	--		2.26
cis-1,2-Dichloroethene	1.44	0.452	--	5.71	1.79	--		2.26
Trichloroethene	3.41	0.452	--	18.3	2.43	--		2.26
Tetrachloroethene	ND	0.452	--	ND	3.07	--		2.26

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	86		60-140
Bromochloromethane	87		60-140
chlorobenzene-d5	83		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-08 D
Client ID: SV-07_20181212-FD
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 13:21
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 20:26
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.453	--	ND	1.16	--		2.267
1,1-Dichloroethene	ND	0.453	--	ND	1.80	--		2.267
trans-1,2-Dichloroethene	ND	0.453	--	ND	1.80	--		2.267
cis-1,2-Dichloroethene	0.929	0.453	--	3.68	1.80	--		2.267
Trichloroethene	1.45	0.453	--	7.79	2.43	--		2.267
Tetrachloroethene	1.31	0.453	--	8.88	3.07	--		2.267

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	86		60-140
Bromochloromethane	88		60-140
chlorobenzene-d5	82		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-09 D
Client ID: SV-08_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 14:37
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 21:00
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.437	--	ND	1.12	--		2.185
1,1-Dichloroethene	ND	0.437	--	ND	1.73	--		2.185
trans-1,2-Dichloroethene	ND	0.437	--	ND	1.73	--		2.185
cis-1,2-Dichloroethene	ND	0.437	--	ND	1.73	--		2.185
Trichloroethene	0.505	0.437	--	2.71	2.35	--		2.185
Tetrachloroethene	ND	0.437	--	ND	2.96	--		2.185

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	86		60-140
Bromochloromethane	89		60-140
chlorobenzene-d5	82		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03

Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-10 D
Client ID: SV-09_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 13:59
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 21:34
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.432	--	ND	1.10	--		2.161
1,1-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
trans-1,2-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
cis-1,2-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
Trichloroethene	1.64	0.432	--	8.81	2.32	--		2.161
Tetrachloroethene	0.527	0.432	--	3.57	2.93	--		2.161

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	85		60-140
Bromochloromethane	88		60-140
chlorobenzene-d5	83		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-11 D
Client ID: SV-10_20181213
Sample Location: JAMESTOWN, NY

Date Collected: 12/13/18 12:17
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 22:09
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	1.18	0.454	--	3.02	1.16	--		2.269
1,1-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
trans-1,2-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
cis-1,2-Dichloroethene	1.20	0.454	--	4.76	1.80	--		2.269
Trichloroethene	1.07	0.454	--	5.75	2.44	--		2.269
Tetrachloroethene	ND	0.454	--	ND	3.08	--		2.269

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	88		60-140
Bromochloromethane	95		60-140
chlorobenzene-d5	86		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-12 D
Client ID: SV-10_20181213-FD
Sample Location: JAMESTOWN, NY

Date Collected: 12/13/18 12:17
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 22:43
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	2.36	0.454	--	6.03	1.16	--		2.269
1,1-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
trans-1,2-Dichloroethene	ND	0.454	--	ND	1.80	--		2.269
cis-1,2-Dichloroethene	2.21	0.454	--	8.76	1.80	--		2.269
Trichloroethene	1.96	0.454	--	10.5	2.44	--		2.269
Tetrachloroethene	5.21	0.454	--	35.3	3.08	--		2.269

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	86		60-140
Bromochloromethane	93		60-140
chlorobenzene-d5	83		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03

Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-13 D
Client ID: SV-11_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 15:13
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 23:18
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.430	--	ND	1.10	--		2.152
1,1-Dichloroethene	ND	0.430	--	ND	1.70	--		2.152
trans-1,2-Dichloroethene	ND	0.430	--	ND	1.70	--		2.152
cis-1,2-Dichloroethene	ND	0.430	--	ND	1.70	--		2.152
Trichloroethene	0.887	0.430	--	4.77	2.31	--		2.152
Tetrachloroethene	ND	0.430	--	ND	2.92	--		2.152

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	85		60-140
Bromochloromethane	87		60-140
chlorobenzene-d5	78		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-14 D
Client ID: SV-12_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 15:50
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/28/18 23:52
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.432	--	ND	1.10	--		2.161
1,1-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
trans-1,2-Dichloroethene	ND	0.432	--	ND	1.71	--		2.161
cis-1,2-Dichloroethene	0.434	0.432	--	1.72	1.71	--		2.161
Trichloroethene	1.20	0.432	--	6.45	2.32	--		2.161
Tetrachloroethene	ND	0.432	--	ND	2.93	--		2.161

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	84		60-140
Bromochloromethane	87		60-140
chlorobenzene-d5	81		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-15 D
Client ID: SV-13_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/12/18 16:33
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/29/18 00:27
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.438	--	ND	1.12	--		2.193
1,1-Dichloroethene	ND	0.438	--	ND	1.74	--		2.193
trans-1,2-Dichloroethene	ND	0.438	--	ND	1.74	--		2.193
cis-1,2-Dichloroethene	ND	0.438	--	ND	1.74	--		2.193
Trichloroethene	ND	0.438	--	ND	2.35	--		2.193
Tetrachloroethene	ND	0.438	--	ND	2.97	--		2.193

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	86		60-140
Bromochloromethane	90		60-140
chlorobenzene-d5	85		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-16 D
Client ID: SV-14_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/13/18 10:31
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/29/18 01:01
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.429	--	ND	1.10	--		2.146
1,1-Dichloroethene	ND	0.429	--	ND	1.70	--		2.146
trans-1,2-Dichloroethene	ND	0.429	--	ND	1.70	--		2.146
cis-1,2-Dichloroethene	0.573	0.429	--	2.27	1.70	--		2.146
Trichloroethene	0.882	0.429	--	4.74	2.31	--		2.146
Tetrachloroethene	ND	0.429	--	ND	2.91	--		2.146

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	83		60-140
Bromochloromethane	87		60-140
chlorobenzene-d5	84		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-17 D
Client ID: SV-15_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/13/18 11:37
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/29/18 00:13
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.444	--	ND	1.13	--		2.218
1,1-Dichloroethene	ND	0.444	--	ND	1.76	--		2.218
trans-1,2-Dichloroethene	ND	0.444	--	ND	1.76	--		2.218
cis-1,2-Dichloroethene	0.554	0.444	--	2.20	1.76	--		2.218
Trichloroethene	ND	0.444	--	ND	2.39	--		2.218
Tetrachloroethene	ND	0.444	--	ND	3.01	--		2.218

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	95		60-140
Bromochloromethane	98		60-140
chlorobenzene-d5	93		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

SAMPLE RESULTS

Lab ID: L1851659-18 D
Client ID: SV-16_20181212
Sample Location: JAMESTOWN, NY

Date Collected: 12/13/18 11:04
Date Received: 12/13/18
Field Prep: Not Specified

Sample Depth:
Matrix: Soil_Vapor
Anaytical Method: 48,TO-15
Analytical Date: 12/29/18 01:31
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**MDL**	**Qualifier**	**Dilution Factor**
Volatile Organics in Air - Mansfield Lab								
Vinyl chloride	ND	0.444	--	ND	1.13	--		2.218
1,1-Dichloroethene	ND	0.444	--	ND	1.76	--		2.218
trans-1,2-Dichloroethene	ND	0.444	--	ND	1.76	--		2.218
cis-1,2-Dichloroethene	0.674	0.444	--	2.67	1.76	--		2.218
Trichloroethene	20.6	0.444	--	111	2.39	--		2.218
Tetrachloroethene	0.978	0.444	--	6.63	3.01	--		2.218

Internal Standard	**% Recovery**	**Qualifier**	**Acceptance Criteria**
1,4-Difluorobenzene	91		60-140
Bromochloromethane	94		60-140
chlorobenzene-d5	90		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/28/18 13:40

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): 01-16 Batch: WG1193607-4								
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03
Lab Number: L1851659
Report Date: 01/02/19

Method Blank Analysis
Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 12/28/18 14:50

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): 17-18 Batch: WG1193633-4								
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1

Lab Control Sample Analysis

Batch Quality Control

Project Name: ESSEX/HOPE

Project Number: 703765CH.01.03

Lab Number: L1851659

Report Date: 01/02/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-16 Batch: WG1193607-3								
Vinyl chloride	91		-		70-130	-		
1,1-Dichloroethene	88		-		70-130	-		
trans-1,2-Dichloroethene	84		-		70-130	-		
cis-1,2-Dichloroethene	86		-		70-130	-		
Trichloroethene	93		-		70-130	-		
Tetrachloroethene	73		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: ESSEX/HOPE

Project Number: 703765CH.01.03

Lab Number: L1851659

Report Date: 01/02/19

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 17-18 Batch: WG1193633-3								
Vinyl chloride	121		-		70-130	-		
1,1-Dichloroethene	116		-		70-130	-		
trans-1,2-Dichloroethene	115		-		70-130	-		
cis-1,2-Dichloroethene	107		-		70-130	-		
Trichloroethene	91		-		70-130	-		
Tetrachloroethene	92		-		70-130	-		

Lab Duplicate Analysis
Batch Quality Control

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03

Lab Number: L1851659
Report Date: 01/02/19

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-16 QC Batch ID: WG1193607-5 QC Sample: L1851659-02 Client ID: SV-02_20181211						
Vinyl chloride	ND	ND	ppbV	NC		25
1,1-Dichloroethene	ND	ND	ppbV	NC		25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC		25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC		25
Trichloroethene	ND	ND	ppbV	NC		25
Tetrachloroethene	2.31	2.26	ppbV	2		25
Volatile Organics in Air - Mansfield Lab Associated sample(s): 17-18 QC Batch ID: WG1193633-5 QC Sample: L1851659-17 Client ID: SV-15_20181212						
Vinyl chloride	ND	ND	ppbV	NC		25
1,1-Dichloroethene	ND	ND	ppbV	NC		25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC		25
cis-1,2-Dichloroethene	0.554	0.550	ppbV	1		25
Trichloroethene	ND	ND	ppbV	NC		25
Tetrachloroethene	ND	ND	ppbV	NC		25

Project Name: ESSEX/HOPE

Project Number: 703765CH.01.03

Lab Number: L1851659

Report Date: 01/02/19

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
L1851659-01	SV-01_20181211	0211	Flow 2	12/10/18	280786		-	-	-	Pass	200	92	74
L1851659-01	SV-01_20181211	2396	1.0L Can	12/10/18	280786	L1832965-02	Pass	-29.6	-2.4	-	-	-	-
L1851659-02	SV-02_20181211	0146	Flow 1	12/10/18	280786		-	-	-	Pass	200	221	10
L1851659-02	SV-02_20181211	803	1.0L Can	12/10/18	280786	L1848624-02	Pass	-29.6	-1.3	-	-	-	-
L1851659-03	SV-03_20181211	0314	Flow 3	12/10/18	280786		-	-	-	Pass	200	209	4
L1851659-03	SV-03_20181211	683	1.0L Can	12/10/18	280786	L1836539-02	Pass	-29.6	-2.4	-	-	-	-
L1851659-04	SV-04_20181212	0355	Flow 3	12/10/18	280786		-	-	-	Pass	200	200	0
L1851659-04	SV-04_20181212	567	1.0L Can	12/10/18	280786	L1849158-02	Pass	-29.6	-1.8	-	-	-	-
L1851659-05	SV-05_20181212	0756	Flow 3	12/10/18	280786		-	-	-	Pass	200	200	0
L1851659-05	SV-05_20181212	872	1.0L Can	12/10/18	280786	L1849355-02	Pass	-29.6	-1.5	-	-	-	-
L1851659-06	SV-06_20181212	0126	Flow 1	12/10/18	280786		-	-	-	Pass	200	340	52
L1851659-06	SV-06_20181212	2089	1.0L Can	12/10/18	280786	L1849158-02	Pass	-29.1	-1.0	-	-	-	-
L1851659-07	SV-07_20181212	0594	Flow 5	12/10/18	280786		-	-	-	Pass	200	192	4
L1851659-07	SV-07_20181212	2163	1.0L Can	12/10/18	280786	L1834244-02	Pass	-29.6	-2.2	-	-	-	-
L1851659-08	SV-07_20181212-FD	2406	1.0L Can	12/10/18	280786		Pass	-29.6	-2.2	-	-	-	-

Project Name: ESSEX/HOPE

Lab Number: L1851659

Project Number: 703765CH.01.03

Report Date: 01/02/19

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
L1851659-09	SV-08_20181212	01010	Flow 2	12/10/18	280786		-	-	-	Pass	200	200	0
L1851659-09	SV-08_20181212	2168	1.0L Can	12/10/18	280786	L1846293-02	Pass	-29.6	-1.4	-	-	-	-
L1851659-10	SV-09_20181212	0377	Flow 2	12/10/18	280786		-	-	-	Pass	200	204	2
L1851659-10	SV-09_20181212	855	1.0L Can	12/10/18	280786	L1849179-02	Pass	-29.6	-1.3	-	-	-	-
L1851659-11	SV-10_20181213	702	1.0L Can	12/10/18	280786	L1849179-02	Pass	-29.6	-2.4	-	-	-	-
L1851659-12	SV-10_20181213-FD	0546	Flow 4	12/10/18	280786		-	-	-	Pass	200	200	0
L1851659-12	SV-10_20181213-FD	675	1.0L Can	12/10/18	280786	L1849355-02	Pass	-29.6	-2.3	-	-	-	-
L1851659-13	SV-11_20181212	0677	Flow 3	12/10/18	280786		-	-	-	Pass	200	205	2
L1851659-13	SV-11_20181212	1918	1.0L Can	12/10/18	280786	L1849158-02	Pass	-29.8	-0.59	-	-	-	-
L1851659-14	SV-12_20181212	0934	Flow 3	12/10/18	280786		-	-	-	Pass	200	204	2
L1851659-14	SV-12_20181212	681	1.0L Can	12/10/18	280786	L1849046-02	Pass	-29.6	-1.0	-	-	-	-
L1851659-15	SV-13_20181212	0378	Flow 5	12/10/18	280786		-	-	-	Pass	200	200	0
L1851659-15	SV-13_20181212	886	1.0L Can	12/10/18	280786	L1849179-02	Pass	-29.6	-1.2	-	-	-	-
L1851659-16	SV-14_20181212	0224	Flow 2	12/10/18	280786		-	-	-	Pass	200	206	3
L1851659-16	SV-14_20181212	1914	1.0L Can	12/10/18	280786	L1849355-02	Pass	-29.5	-0.90	-	-	-	-

Project Name: ESSEX/HOPE

Project Number: 703765CH.01.03

Lab Number: L1851659

Report Date: 01/02/19

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
L1851659-17	SV-15_20181212	0407	Flow 2	12/10/18	280786		-	-	-	Pass	200	204	2
L1851659-17	SV-15_20181212	2404	1.0L Can	12/10/18	280786	L1849355-02	Pass	-29.6	-2.5	-	-	-	-
L1851659-18	SV-16_20181212	01123	Flow 1	12/10/18	280786		-	-	-	Pass	200	203	1
L1851659-18	SV-16_20181212	2467	1.0L Can	12/10/18	280786	L1849355-02	Pass	-29.7	-1.7	-	-	-	-

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1832965
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 08/22/18 19:22
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1832965
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1832965

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1832965
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1832965
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	88		60-140
Bromochloromethane	90		60-140
chlorobenzene-d5	89		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1832965

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 08/22/18 19:22
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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 **Lab Number:** L1832965

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:

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								
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	0.061	0.020	--	0.414	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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1832965
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1832965-02
Client ID: CAN 2396 SHELF 15
Sample Location:

Date Collected: 08/21/18 16:00
Date Received: 08/22/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	89		60-140
bromochloromethane	93		60-140
chlorobenzene-d5	90		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1834244
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 08/30/18 20:10
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1834244
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1834244

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1834244
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1834244
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	90		60-140
Bromochloromethane	92		60-140
chlorobenzene-d5	95		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1834244
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 08/30/18 20:10
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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 **Lab Number:** L1834244

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1834244
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1834244-02
Client ID: CAN 2163 SHELF 7
Sample Location:

Date Collected: 08/29/18 16:00
Date Received: 08/30/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	91		60-140
chlorobenzene-d5	88		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1836539
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 09/14/18 17:43
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1836539
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1836539

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1836539
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1836539
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					
Silanol, Trimethyl-	1.0	NJ	ppbV		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	96		60-140
Bromochloromethane	112		60-140
chlorobenzene-d5	96		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1836539
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 09/14/18 17:43
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1836539
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1836539
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1836539-02
Client ID: CAN 683 SHELF 11
Sample Location:

Date Collected: 09/13/18 16:00
Date Received: 09/14/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	95		60-140
bromochloromethane	112		60-140
chlorobenzene-d5	95		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1846293

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 11/12/18 18:56
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1846293
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1846293
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1846293
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1846293
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					
Ethene, chlorotrifluoro-	1.4	NJ	ppbV		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	79		60-140
Bromochloromethane	88		60-140
chlorobenzene-d5	93		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1846293
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 11/12/18 18:56
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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	0.085	0.050	--	0.651	0.383	--		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 **Lab Number:** L1846293

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1846293
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1846293-02
Client ID: CAN 2168 SHELF 17
Sample Location:

Date Collected: 11/09/18 07:30
Date Received: 11/12/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	79		60-140
bromochloromethane	93		60-140
chlorobenzene-d5	80		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 11/29/18 10:15
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	70		60-140
Bromochloromethane	80		60-140
chlorobenzene-d5	73		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 11/29/18 10:15
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1848624
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1848624-02
Client ID: CAN 803 SHELF 15
Sample Location:

Date Collected: 11/28/18 16:00
Date Received: 11/29/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	72		60-140
bromochloromethane	80		60-140
chlorobenzene-d5	76		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 11/30/18 20:28
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	92		60-140
Bromochloromethane	95		60-140
chlorobenzene-d5	93		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 11/30/18 20:28
Analyst: RY

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849046
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849046-02
Client ID: CAN 681 SHLEF 16
Sample Location:

Date Collected: 11/30/18 09:00
Date Received: 11/30/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	93		60-140
bromochloromethane	95		60-140
chlorobenzene-d5	94		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/01/18 18:19
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	95		60-140
Bromochloromethane	97		60-140
chlorobenzene-d5	94		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/01/18 18:19
Analyst: EW

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849158
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849158-02
Client ID: CAN 1918 SHELF 15
Sample Location:

Date Collected: 11/29/18 16:00
Date Received: 12/01/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	97		60-140
bromochloromethane	99		60-140
chlorobenzene-d5	97		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/03/18 16:41
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	93		60-140
Bromochloromethane	95		60-140
chlorobenzene-d5	92		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/03/18 16:41
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849179
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849179-02
Client ID: CAN 855 SHELF 8
Sample Location:

Date Collected: 12/01/18 16:00
Date Received: 12/03/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	94		60-140
bromochloromethane	100		60-140
chlorobenzene-d5	95		60-140

Project Name: BATCH CANISTER CERTIFICATION **Lab Number:** L1849355

Project Number: CANISTER QC BAT **Report Date:** 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 12/04/18 17:12
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849355
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849355
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:

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								
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
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1849355
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:

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								
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849355
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:

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								

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	93		60-140
Bromochloromethane	96		60-140
chlorobenzene-d5	95		60-140

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849355
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:
Matrix: Air
Anaytical Method: 48,TO-15-SIM
Analytical Date: 12/04/18 17:12
Analyst: MB

	ppbV			ug/m3				
Parameter	**Results**	**RL**	**MDL**	**Results**	**RL**	**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
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: L1849355
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:

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								
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

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT
Lab Number: L1849355
Report Date: 01/02/19

Air Canister Certification Results

Lab ID: L1849355-02
Client ID: CAN 872 SHELF 11
Sample Location:

Date Collected: 12/03/18 16:00
Date Received: 12/04/18
Field Prep: Not Specified

Sample Depth:

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								
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
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	94		60-140
bromochloromethane	95		60-140
chlorobenzene-d5	96		60-140

Project Name: ESSEX/HOPE
Project Number: 703765CH.01.03

Lab Number: L1851659
Report Date: 01/02/19

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
N/A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L1851659-01A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-02A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-03A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-04A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-05A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-06A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-07A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-08A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-09A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-10A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-11A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-12A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-13A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-14A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-15A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-16A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-17A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)
L1851659-18A	Canister - 1 Liter	N/A	NA			Y	Absent		TO15-LL(30)

*Values in parentheses indicate holding time in days

Project Name:	ESSEX/HOPE	**Lab Number:**	L1851659
Project Number:	703765CH.01.03	**Report Date:**	01/02/19

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).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
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.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample¿s toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
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.

Report Format: Data Usability Report

Project Name:	ESSEX/HOPE	**Lab Number:**	L1851659
Project Number:	703765CH.01.03	**Report Date:**	01/02/19

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 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

Project Name:	ESSEX/HOPE	**Lab Number:**	L1851659
Project Number:	703765CH.01.03	**Report Date:**	01/02/19

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 624/624.1: 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 6860: SCM: Perchlorate

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
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: Chloride, 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: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **LACHAT 10-107-06-1-B**: Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2**: Nitrate-N**, 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 300: Chloride, Sulfate, Nitrate.**
EPA 624.1: Volatile Halocarbons & Aromatics,
EPA 608.3: 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 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522.

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, Fe, Pb, Mn, Ni, K, Se, Ag, Na, 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 2

CHAIN OF CUSTODY

ALPHA ANALYTICAL
320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 12/14/18

ALPHA Job #: L1851659

Client Information

Client: Jacobs / CH2M
Address: 18 Tremont Street
Boston, MA 02108
Phone: 617-963-3129
Fax:
Email: Kyle.Block@Jacobs.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Essex - Hope
Project Location: Jamestown, NY
Project #: 703765CH.01.03
Project Manager: Kyle Block
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
14-Day
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 #:
See 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	I D Can	I D - Flow Controller	ANALYSIS TO-15	TO-15 SIM	APH Subset Non-petroleum HCs ☐	Fixed Gases	Sulfides & Mercaptans by TO-15	Sample Comments (i.e. PID)
51659.01	SV-01_20181211	12/11/18	1724	1734	-29.20	-3.81	SV	AS	1L	2396	0211	X					
.02	SV-02_20181211	12/11/18	1600	1605	-28.46	-2.61	SV	AS	1L	803	0146	X					
.03	SV-03_20181211	12/11/18	1518	1522	-28.59	-3.56	SV	AS	1L	683	0314	X					
.04	SV-04_20181212	12/12/18	0928	0933	-28.68	-2.99	SV	AS	1L	567	0355	X					
.05	SV-05_20181212	12/12/18	1054	1059	-29.98	-2.55	SV	AS	1L	872	0756	X					
.06	SV-06_20181212	12/12/18	1004	1007	-28.83	-2.30	SV	AS	1L	2089	0126	X					
.07	SV-07_20181212	12/12/18	1311	1321	-29.31	-3.35	SV	AS	1L	1163	0594	X					
.08	SV-07_20181212-FD	12/12/18	1311	1321	-29.08	-3.41	SV	AS	1L	2406	0594	X					
.09	SV-08_20181212	12/12/18	1432	1437	-29.07	-2.36	SV	AS	1L	2168	01010	X					
.10	SV-09_20181212	12/12/18	1354	1359	-29.00	-2.27	SV	AS	1L	855	0377	X					

*SAMPLE MATRIX CODES
AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

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:
AAL	12/13/18 1410	AAL	12/13/18 @ 1410
	12/13/18 1620		12/13/18 1620
	12/14/18 0620		12/14/18 0620

AIR ANALYSIS

PAGE 2 OF 2

CHAIN OF CUSTODY

ALPHA ANALYTICAL
320 Forbes Blvd, Mansfield, MA 02048
TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 12/14/18

ALPHA Job #: L1851659

Client Information

Client: Jacobs / CH2M
Address: 18 Tremont Street
Boston, MA 02108
Phone: 617-963-3129
Fax:
Email: Kyle.Block@Jacobs.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: Essex - Hope
Project Location: Jamestown, NY
Project #: 703765CH.01.03
Project Manager: Kyle Block
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved!)
14-Day
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 #:
See 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 (Subtract Non-petroleum HCs ☐)	Fixed Gases	Sulfides & Mercaptans by TO-15	Sample Comments (i.e. PID)
1851659.01	SV-10_20181213	12/13/18	1209	1217	-28.95	-3.22	SV	AS	1L	702	~~0575~~ 0546	X					
.12	SV-10_20181213-FD	12/13/18	1209	1217	-28.85	-3.14	SV	AS	1L	675	0546	X					
.13	SV-11_20181212	12/12/18	1508	1513	-28.94	-1.64	SV	AS	1L	718	0677	X					
.14	SV-12_20181212	12/12/18	1545	1550	-28.79	-2.07	SV	AS	1L	681	0934	X					
.15	SV-13_20181212	12/12/18	1628	1633	-29.00	-2.39	SV	AS	1L	886	0378	X					
.16	SV-14_20181213	12/13/18	1026	1031	-29.00	-1.77	SV	AS	1L	1914	0224	X					
.17	SV-15_20181213	12/13/18	1132	1137	-29.02	-3.29	SV	AS	1L	2404	0407	X					
.18	SV-16_20181213	12/13/18	1059	1104	-29.00	-2.47	SV	AS	1L	2467	0123	X					

*SAMPLE MATRIX CODES

AA = Ambient Air (Indoor/Outdoor)
SV = Soil Vapor/Landfill Gas/SVE
Other = Please Specify

Container Type

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:
AAL	12/13/18 1410	AAL	12/13/18 @1410
	12/13/18/1620		12/13/18 1620
	12/14/18 0620		12/14/18 0620

Appendix F
Notification Letters

The Dow Chemical Company
P.O. Box 8361
South Charleston, WV 25303-8361
USA

January 18, 2019

Mr. Barry Harris
H & H Metal Specialty, Inc.
153 Hopkins Avenue
Jamestown, New York 14701

Subject: Results of the Soil Vapor Intrusion Evaluation Conducted at 153 Hopkins Avenue

Dear Mr. Harris:

This letter has been prepared to provide the results of the soil vapor intrusion (SVI) evaluation performed on November 14, 2018, at 153 Hopkins Avenue. Additional soil vapor samples necessary to perform a SVI pathway assessment were collected between December 11 and 13, 2018 along the adjacent streets. The work was performed in association with ongoing investigations related to the Essex-Hope Superfund Site (Site ID No. 907015). This evaluation was performed with cooperation from the New York State Department of Environmental Conservation (NYSDEC) and the New York State Department of Health (NYSDOH).

The sub-slab vapor sampling data were reviewed for accuracy, and validation of these results was completed on January 14, 2019. The results from samples collected from 153 Hopkins Avenue are included in Table 1 and the locations of the samples collected are provided on Figure 1. The results were screened against NYSDOH sub-slab vapor concentration criteria (which do not account for the differences between residences and commercial buildings) to determine if further action is needed. Results were also compared against calculated U.S. Environmental Protection Agency (EPA) commercial sub-slab vapor intrusion screening levels (VISLs). Certain chemicals were detected in sub-slab soil vapor at the property. This letter is being provided in accordance with NYSDEC Law Article 27-2405 to provide timely notification. These results are being further evaluated to determine if additional actions are necessary.

Results and Evaluation

Sub-slab soil vapor samples were collected within the H & H Metal Specialty, Inc. facility in November 2018 following the completion of building surveys conducted in April 2018. The surveys attempted to inventory chemicals present in the sampling areas that have the potential to affect air sample results. A summary of volatile organic compounds (VOCs) detected in the November 2018 sub-slab soil vapor samples is presented in Table 1; the sampling locations are identified on Figure 1.

Detected VOC concentrations in sub-slab vapor soil are evaluated against the following criteria (see Table 1):

1. Calculated EPA commercial VISLs (EPA, 2018).
2. NYSDOH sub-slab vapor concentrations criteria per *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006). A copy of the NYSDOH soil vapor/indoor air decision matrices is included in Attachment 1. Note that indoor air data are required to determine if any further action is needed per the NYSDOH decision matrices.

Comparison to EPA VISLs and NYSDOH Air Guideline Values

Seven sub-slab locations were sampled within the H & H Metal Specialty, Inc. facility as shown on Figure 1, with the respective results listed in Table 1. At the time of sampling, the facility was vacant. Cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethene (TCE), and tetrachloroethene (PCE) were detected at concentrations greater than the most conservative NYSDOH and/or EPA soil vapor screening criteria in various samples. Only two sub-slab soil vapor sample results (HH-06 and HH-07) are in exceedance of both

the NYSDOH and calculated EPA soil vapor screening criteria for TCE. No other substances were detected. Additional information on the chemicals of concern detected at the property is presented in Attachment 1.

Summary and Conclusions

Investigation activities conducted in November and December 2018 identified TCE, cis-1,2-DCE, and PCE in sub-slab soil vapor at concentrations greater than NYSDOH and/or calculated EPA soil vapor screening criteria. A comprehensive SVI pathway assessment is currently being performed and will be presented to NYSDEC and NYSDOH. We will inform you of any potential additional sampling efforts required to complete the SVI study at your facility.

We appreciate your cooperation for the duration of this project. If you would like to discuss these results, please contact me at 304.747.3763.

Sincerely,

Tim King
Authorized Representative

Enclosures
Table 1 – Detected Concentrations of Volatile Organic Compounds in Sub-slab Soil Vapor
Figure 1 – Soil Vapor Intrusion Investigation Locations
Attachment 1 – NYSDOH Fact Sheets and Information

References

New York State Department of Health (NYSDOH). 2006. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. October. Updated May 2017.

U.S. Environmental Protection Agency (EPA). 2013. *Office of Solid Waste and Emergency Response (OSWER) Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air*. External Review Draft. April 11.

U.S. Environmental Protection Agency (EPA). 2018. VISL Calculator for Commercial Sub-slab Vapor Intrusion Screening Level. November. https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator.

Table

TABLE 1
Detected Concentrations of Volatile Organic Compounds in Sub-slab Soil Vapor
153 Hopkins Avenue

LOCATION						HH-01-20181115		HH-02-20181115		HH-03-20181115		HH-04-20181115		HH-04-20181115-FD		HH-05-20181115		HH-06-20181115		HH-07-20181115	
SAMPLING DATE						11/15/2018		11/15/2018		11/15/2018		11/15/2018		11/15/2018		11/15/2018		11/15/2018		11/15/2018	
SCREENING CRITERIA	NY-SSC-A	NY-SSC-B	NY-SSC-C	USEPA VISL	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Volatile Organic Compounds (VOCs)																					
Vinyl chloride	--	--	6	93	µg/m^3	1.14	U	1.12	U	1.1	U	1.24	U	1.23	U	1.15	U	2.28	U	1.08	U
1,1-Dichloroethene	6	--	--	29,000	µg/m^3	1.77	U	1.73	U	1.71	U	1.93	U	1.9	U	1.78	U	3.53	U	1.68	U
trans-1,2-Dichloroethene	--	--	--	NA	µg/m^3	1.77	U	1.73	U	1.71	U	1.93	U	1.9	U	1.78	U	3.53	U	1.68	U
cis-1,2-Dichloroethene	6	--	--	NA	µg/m^3	**11.8**		**6.9**		**7.33**		**4.96**		**4.64**		**2.2**		**26**		**6.98**	
Trichloroethene	6	--	--	100	µg/m^3	**33**		**16.7**		**23.1**		**14.5**		**14**		**17**		**1320**		**473**	
Tetrachloroethene	--	100	--	1,600	µg/m^3	**24.4**		**43.5**		2.93	U	**102**		**101**		**31.3**		**9.9**		**4.58**	

Notes:
µg/m^3 = micrograms per cubic meter
FD = Field Duplicate Sample
U = Not detected at the reported detection limit for the sample.
NY-SSC-A: NYSDOH Matrix A Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, updated May 2017.
NY-SSC-B: NYSDOH Matrix B Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, updated May 2017.
NY-SSC-C: NYSDOH Matrix C Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, updated May 2017.
EPA VISL: Calculated EPA Commercial Sub-slab Vapor Intrusion Screening Level, November, 2018 (TCR = 1x10-6 ; Q=1) available at https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator
Bold results indicate detection of chemical above the detection limit
Exceeds NY-SSC
Exceeds EPA Sub-slab Vapor Intrusion Screening Level

Figure



Sanitary Sewer Location

Storm Sewer Location

Soil Vapor Sample Location

Subslab Vapor Sample Location

Sanitary/Storm Sewer

Approximate Site Boundary

Parcels

Access to Rollform was Denied and therefore sampling has not been proposed at this time

Chadakoin River

Notes:
1. Yellow highlighted cells: Exceeds NY-SSC, but indoor air data is required to determine if any further action is needed per the matrix.
2. Red text within cells: Exceeds USEPA Sub-slab Vapor Intrusion Screening Level

N

BASE MAP SOURCE:

0 25 50 100

Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 1
Soil Vapor Intrusion Investigation Locations
Off-site Vapor Intrusion Investigation Work Plan

CREATED BY: LA	JACOBS
REVIEWED BY: AS	

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Attachment 1
NYSDOH Fact Sheets and Information

Bureau of Toxic Substance Assessment
New York State Department of Health
August 2015

IMPORTANT INFORMATION ON TRICHLOROETHENE (TCE) IN INDOOR AND OUTDOOR AIR[1]

Trichloroethene (TCE)

Trichloroethene (also known as trichloroethylene or TCE) is a human-made chemical. It is volatile, meaning it readily evaporates at room temperature into the air, where you can sometimes smell it. It is used as a solvent to remove grease from metal, a paint stripper, an adhesive solvent, an ingredient in paints and varnishes, and in the manufacture of other chemicals and products (for example, furniture and electric/electronic equipment).

Exposure to TCE

People may be exposed to TCE in air, water, and food, or when TCE or material containing TCE (for example, soil) gets on the skin. For most people, almost all TCE exposure is from indoor air.

Sources of TCE in Air

TCE may get into indoor air when TCE-containing products (for example, glues, adhesives, paint removers, spot removers, and metal cleaners) are used. Another source could be evaporation from contaminated well water that is used for household purposes. TCE may enter homes through soil vapor intrusion, which occurs when TCE evaporates from contaminated groundwater, enters soil vapor (air spaces between soil particles), and migrates through cracks or other openings in the foundation and into the building. TCE gets into outdoor air when it is released from industrial facilities and when it evaporates from areas where chemical wastes are stored or disposed.

Levels Typically Found in Air

The background indoor air levels of TCE in homes and office buildings not near known environmental sources of TCE are almost always 1 microgram per cubic meter of air (1 mcg/m^3) or less. Background outdoor air levels also are almost always 1 mcg/m3 or less.

Health Risks Associated with Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans (for example, workplace air levels 90,000 to 800,000 mcg/m^3). TCE exposure can cause effects on the central nervous system, liver, kidneys, and immune system of humans. TCE exposure is

[1] For a more technical discussion of this information, see the fact sheet "Trichloroethene (TCE) In Indoor and Outdoor Air" available at http://www.health.ny.gov/environmental/chemicals/trichloroethene/.

associated with reproductive effects in men and women, and may affect fetal development during pregnancy. However, the studies suggest, but do not prove, that the reproductive and developmental effects were caused by TCE, and not by some other factor. The United States Environmental Protection Agency (USEPA) classifies TCE as a chemical that causes cancer in humans by all routes of exposure. Whether a person experiences a health effect depends on how much of the chemical he or she is exposed to, how often the exposure occurs, and how long the exposures last. Individual characteristics such as age, health, lifestyle, and genetics also play a role.

The New York State Department of Health (NYSDOH) Guideline for TCE in Air

NYSDOH recommends that TCE levels in air not exceed 2 mcg/m^3. This replaces the previous guideline of 5 mcg/m^3. The guideline was set at an air level that is lower than levels known to cause, or suspected of causing, health effects in humans, including sensitive populations (for example, children, pregnant women) and animals. The guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for months or as long as a lifetime. Continuous exposure is rarely true for most people, who, if exposed, are more likely to be exposed for a part of the day, part of a week, or part of their lifetime.

The guideline is used to help guide decisions regarding the urgency of efforts to reduce TCE exposure. At TCE air levels above the guideline, the higher the level, the greater the urgency to take action to reduce exposure. But as with any chemical in indoor air, the NYSDOH always recommends taking action to reduce exposure when the air concentration of a chemical is above background, even if it is below the guideline.

Indoor air concentrations substantially above the guideline clearly indicate a significant TCE source and the need for action to reduce exposure. In particular, NYSDOH has concerns about exposure during pregnancy, particularly during the first trimester, to air concentrations higher than 20 mcg/m^3 because the major steps of heart development occur during this period and TCE may be a risk factor for fetal heart defects in humans. Thus, NYSDOH recommends taking immediate and effective action to reduce exposure when an air concentration is equal to, or above 20 mcg/m^3. In all cases, the specific recommended action depends on a case-by-case evaluation of the situation.

Concerns about Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans. However, if you are concerned that you, your children, or others have been exposed to TCE, discuss your symptoms/signs with your health care provider. There are special tests to measure TCE and related chemicals in your blood, breath, or urine, and your health care provider can compare the results to those of people without known exposure to TCE or to workers with high exposure to TCE.

Questions

If you have any questions about the information in this fact sheet, would like to know more about TCE, or are concerned that you may be exposed to elevated levels of TCE, please call the New York State Department of Health at 1-518-402-7800 or 1-800-458-1158, send an e-mail to btsa@health.ny.gov, or write to the following address.

New York State Department of Health
Bureau of Toxic Substance Assessment
Corning Tower, Room 1743
Empire State Plaza,
Albany, NY 12237

TETRACHLOROETHENE (PERC) IN INDOOR AND OUTDOOR AIR

SEPTEMBER 2013 FACT SHEET

This fact sheet answers questions about a chemical called tetrachloroethene (PERC), which is widely used to dry-clean clothes. It provides information on health effects seen in humans exposed to PERC in air. It also provides information about the New York State Department of Health's new guideline of 30 micrograms of PERC per cubic meter of air (30 mcg/m^3) or 0.03 milligrams of PERC per cubic meter of air (0.03 mg/m^3). The fact sheet focuses on the health risks from air exposures because most of the PERC released into the environment goes into air.

Prepared by

Bureau of Toxic Substance Assessment
New York State Department of Health

1. WHAT IS TETRACHLOROETHENE (PERC)?

Tetrachloroethene is a manufactured chemical that is widely used in the dry-cleaning of fabrics, including clothes. It is also used for degreasing metal parts and in manufacturing other chemicals. Tetrachloroethene is found in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors. Other names for tetrachloroethene include PERC, tetrachloroethylene, perchloroethylene, and PCE. PERC is a commonly used name and will be used in the rest of the fact sheet.

PERC is a nonflammable, colorless liquid at room temperature. It readily evaporates into air and has an ether-like odor. Because most people stop noticing the odor of PERC in air after a short time, odor is not a reliable warning signal of PERC exposure.

2. HOW CAN I BE EXPOSED TO PERC?

People may be exposed to PERC in air, water, and food. Exposure can also occur when PERC or material containing PERC (for example, soil) gets on the skin. For most people, almost all exposure is from PERC in air.

PERC gets into outdoor and indoor air by evaporation from industrial or dry-cleaning operations and from areas where chemical wastes are stored or disposed. People living in homes located near these operations may be exposed to higher levels of PERC than the general population not living near such operations. Groundwater near these areas may become contaminated if PERC is improperly dumped or leaks into the ground. People may be exposed if they drink the contaminated water. They also may be exposed if PERC evaporates from contaminated drinking water into indoor air during cooking and washing. PERC may evaporate from contaminated groundwater and soil into the indoor air of buildings above the contaminated area. PERC also may evaporate from dry-cleaned clothes into indoor air or may get into indoor air after PERC-containing products, such as spot removers, are used. Indoor air PERC levels may get high if PERC-containing products are used in poorly ventilated areas.

3. HOW DOES PERC ENTER AND LEAVE MY BODY?

When people inhale air containing PERC, the PERC is taken into the body through the lungs and passed into the blood, which carries it to all parts of the body. A large fraction of this PERC is exhaled, unchanged, through the lungs into the air. Some of this PERC is stored in the body (for example, in fat, the liver, and the brain) and some is broken down in the liver to other compounds and eliminated in urine. PERC can also be found in breastmilk. Once exposure stops, most of the PERC and its breakdown products leave the body in several days. However, it may take several weeks for all of the PERC and its breakdown products to leave the body.

4. WHAT KINDS OF HEALTH EFFECTS CAN BE CAUSED BY EXPOSURE TO PERC IN AIR?

In humans, PERC may affect the central nervous system, the liver, kidneys, blood, immune system, and perhaps the reproductive system. The available data are insufficient to draw conclusions regarding effects of PERC exposure on development in infants and children.

For all health effects, the potential for an increased health risk depends on several factors, including the amount of exposure, the frequency of exposures, and the duration of the exposures. It also depends on the characteristics of the exposed person, such as age, sex, diet, family traits, lifestyle, genetic background, the presence of other chemicals in their body (e.g., alcohol, prescription drugs), and general state of health. Although difficult to quantify, these differences can affect how people will respond to a given exposure. This is known as sensitivity. Differences in sensitivity should be kept in mind when reading the following information on the human health effects of PERC.

Short-Term Exposure - Studies with volunteers show that exposure of eight hours or less to 700,000 micrograms per cubic meter of air (mcg/m^3) cause central nervous system symptoms such as dizziness, headache, sleepiness, lightheadedness, and poor balance. Exposure to 350,000 mcg/m^3 for four hours affected the nerves of the visual system and reduced scores on certain behavioral tests (which, for example, measure the speed and accuracy of a person's response to something they see on a computer screen). These effects were mild and disappeared soon after exposure ended.

Long-Term Exposure - Numerous studies of dry-cleaning workers indicate that long-term exposure (7 to 20 years, for example) to workplace air levels (41,000 mcg/m^3 to 120,000 mcg/m^3) caused reduced scores on neurobehavioral or color vision tests, increased levels of biochemical indicators of liver or kidney damage, reduced red blood cells, and blood and immune system effects [increased white blood cells and blood levels of a certain type of antibody (immunoglobulin E)]. The effects were mild and required special tests to be detected. It is not known how long these effects last.

The New York State Department of Health (NYSDOH, 2010) measured visual function [visual contrast sensitivity (VCS); color vision][1] in adults and children living in the apartments located in buildings with or without a dry-cleaner using PERC and also measured PERC indoor air levels. PERC levels were higher in the indoor air of apartments in buildings with dry-cleaners. Elevated indoor air PERC levels were associated with a slightly increased risk for children to have decreased VCS scores. The effect of PERC on VCS scores was most noticeable in a small group of children living in buildings with co-located dry cleaners using PERC. In those apartments, indoor air PERC levels ranged from 127 to 710 mcg/m^3, with a 50th percentile[2] (also known as the median) level of 340 mcg/m^3. For affected children (7 years mean duration of residency), the decrease was very small and occurred for only one eye in one of five tests. Mean VCS test scores were still within a normal range. Therefore, the risk for decreased VCS scores among affected children is considered to be small. Elevated indoor air PERC levels were not associated with effects on adult VCS scores, or with color vision of either children or adults. The observed associations between elevated indoor air PERC levels and children's VCS suggests that indoor air PERC levels in the range detected may have subtle effects on the brain.

A few epidemiological studies showed positive associations between workplace PERC exposure and reproductive effects (increased risk of spontaneous abortion, sperm disorders, and reduced fertility or delayed conception). Data on workplace air levels were not reported or were limited; however, workplace air levels during the times these studies were conducted were considerably higher than those typically found in indoor or outdoor air. These data suggest, but do not prove, that the reproductive effects were caused by PERC and not by some other factor or factors.

Lastly, epidemiological studies provide a pattern of evidence for a positive association between PERC exposure in the workplace and several types of cancer, specifically bladder cancer, non-Hodgkin lymphoma, and multiple myeloma. These associations were observed in studies with high quality assessments of the likelihood of PERC only exposures. However, data on PERC workplace air levels were not reported, but measurements from other studies indicate that workplace air levels during the times the workers were exposed were considerably higher than those typically found in indoor or outdoor air. Moreover, it is unlikely that the associations were dependent, totally or in part, on factors other than PERC exposures, such as common lifestyle factors as smoking or drinking alcohol. Data from more limited studies suggest that other types of cancer (esophageal, kidney, lung, liver, cervical, and breast cancer) are associated with PERC exposure. In laboratory studies, PERC caused cancer in rats and mice when they ingested or inhaled high doses almost daily for a lifetime. Based on human and animal data, the United States Environmental Protection Agency (USEPA) classifies PERC as “likely to be carcinogenic in humans by all routes of exposure.”

[1] VCS is a measure of a person's ability to distinguish the contrast between a viewed object and its background. It is easier to detect images of high contrast (e.g., a black cat on snow) than low contrast (e.g., a white cat on snow).

[2] Half the results are less than or equal to this value and half are above this value.

5. WHAT ARE BACKGROUND LEVELS FOR PERC IN OUTDOOR AND INDOOR AIR IN AREAS THAT ARE NOT NEAR A KNOWN ENVIRONMENTAL SOURCE OF PERC?

Various studies provide data on background levels of PERC in outdoor and indoor air. The New York State Department of Environmental Conservation collects data on outdoor air levels of air toxics under the Toxics Monitoring System (also known as Volatile Organics Network). The monitoring sites were selected to provide air quality data from the state's urban, industrial, residential, and rural areas. Based on 5882 samples collected across the state during 1999 to 2008, the 50th percentile (median) and 95th percentile[3] PERC levels were 0.41 mcg/m^3 and 4.8 mcg/m^3, respectively. NYSDOH (2005) conducted a study between 1997 and 2005 on the occurrence of volatile organic chemicals, including PERC, in the indoor and outdoor air of about 100 homes across the state (excluding New York City). Two outdoor samples were collected just outside each home for a total of 200 samples. The 50th percentile and 95th percentile PERC levels were less than 0.25 mcg/m^3 and 1.6 mcg/m^3, respectively. Finally, the 50th percentile and 95% percentile PERC levels in 587 outdoor air samples collected in 1999 - 2011 during the investigation of NYS remedial sites not known to have nor suspected to have sources of PERC were 0.52 mcg/m^3 and 2.6 mcg/m^3, respectively (NYSDOH, 2013b). Collectively, these three data sets, particularly given the low 95% percentile level in the large dataset from the Toxics Monitoring System, indicate that fewer than 5% of the background PERC levels in outdoor air are above 10 mcg/m^3.

The NYSDOH, the USEPA, and others have collected and analyzed information on PERC levels in indoor air. The table below contains the results from air samples collected inside of buildings that were not near known sources of PERC and other chemicals (for example, a home not known to be near a chemical spill, a hazardous waste site, a dry-cleaner, or a factory). The five studies that reported 90th percentile PERC air levels indicate that fewer than 10% of the background PERC levels in indoor air are above 10 mcg/m^3. In addition, the results for six of the eight studies that reported 95th percentiles and contained most of the samples indicate that fewer than 5% of the background PERC levels in indoor air are above 10 mcg/m^3. The other two studies (NYSDOH, 2009, 2013b; USEPA, 2001, 2013) indicate that fewer than 5% of the background indoor air levels are above 20 mcg/m^3.

[3] 95% of the results are less than or equal to this value.

Background Indoor Air Levels in US Buildings (1990-2013).

Study Description (and Sampling Years)	No. of Samples	Air Level Percentiles (mcg/m^3)			Reference
		50th (median)	90th [A]	95th	
Residential Buildings					
13 studies on residential properties (number NR[B]) in North America (1990-2005)	2312[C]	ND[D] - 2.2 (range)[E]	ND[D] - 7 (range)[E]	4.1 - 9.5 (range)[E]	USEPA (2011); also see Dawson & McAlary (2009)
screening study of households (284) in urban or non-urban areas of MN (1997)	284	1.4	NR[B]	4.9	Adgate et al. (2004)
subset of the screened households (101) in MN (1997)	101	1.3	NR[B]	5.2	
single family homes (about 100) heated with fuel oil from across NYS (excluding NYC) (1997-2003)	400	0.34	2.9	3.9	NYSDOH (2005, 2013a)[F]
households (about 100 each) in Elizabeth, NJ, Houston, TX, and Los Angeles, CA (1999-2001)	554	0.56	NR[B]	6.0	Weisel et al. (2005)
apartments (61) in NYC building **without** a co-located dry-cleaner (2001-2003)	61	2.2	8.5	19.09	NYSDOH (2009, 2013b)
Office Buildings					
public & commercial office buildings (70) in US (1994-1996)	209	1.5	9.3	18	USEPA (2001, 2013)
Mixed-Use Buildings					
buildings (number NR[B]) near NYS remedial sites not known nor suspected to have sources of PERC (1999-2011)	1625	0.72	2.8	6.6	NYSDOH (2013b)

[A] 90% of the results are less than or equal to this value.
[B] NR: not reported.
[C] Total number of samples, but number of samples associated with each percentile range is less than 2312, but was not reported.
[D] ND: not detected.
[E] The range from 13, 8, and 5 studies that reported the 50th, 90th, and 95th percentiles, respectively.
[F] One of the 13 studies included in USEPA (2011) and Dawson & McAlary (2009).

6. WHAT IS THE NEW YORK STATE DEPARTMENT OF HEALTH'S NEW GUIDELINE FOR PERC IN AIR?

After consideration of the potential health effects of PERC, background levels of PERC in air, and analytical techniques (the ability and reliability of methods to measure PERC in air), NYSDOH recommends that the average air level not exceed 30 mcg/m^3. This determination considered continuous, lifetime exposure and sensitive people. Three other ways of expressing the new guideline are 0.03 milligrams per cubic meter of air (0.03 mg/m^3), 4.4 parts per billion (ppb) or 0.0044 parts per million (ppm). This replaces the old guideline of 100 mcg/m^3.

An air guideline of 30 mcg/m^3 is below the PERC air levels known to cause noncancer effects, including developmental and reproductive effects, in humans and animals, and should be protective against those effects. It is lower than the USEPA's (2012) reference concentration (RfC)[4] for PERC of 40 mcg/m^3. The estimated excess cancer risk associated with lifetime, continuous exposure to 30 mcg/m^3 is about one-in-one-hundred thousand.

[4] The reference concentration is an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime.

Decisions about whether to take actions to further reduce exposure are generally made on a case-by-case basis at this level of risk.

However, NYSDOH recommends that reasonable and practical actions should be taken to reduce PERC exposure whenever air levels are above background. The purpose of the guideline is to help guide decisions about the urgency of the actions to reduce PERC exposure. The urgency to initiate these actions and to determine, in a timely manner, whether they have reduced exposure, increases with indoor air levels, particularly when air levels are above the guideline.

Indoor air levels substantially above the guideline indicate a significant PERC source and may require more immediate remedial action. NYSDOH has concerns about lengthy exposure (months to years) to air levels higher than 300 mcg/m^3 because the results of a recent NYSDOH study suggested that indoor air PERC levels in apartments (median value of 340 mcg/m^3) may have subtle effects on the nervous system (vision function) of children (NYSDOH, 2010 at http://www.health.ny.gov/environmental/investigations/perc/info_sheet.htm). Thus, NYSDOH recommends taking immediate and effective action to reduce exposure when an air level is equal to or above 300 mcg/m^3. In all cases, the specific corrective actions to be taken depend on a case-by-case evaluation of the situation. The goal of the recommended actions is to reduce PERC levels in indoor air to as close to background as practical.

7. WHY DID NEW YORK STATE DEPARTMENT OF HEALTH REDUCE THE GUIDELINE FOR PERC IN AIR FROM 100 MCG/M^3 TO 30 MCG/M^3?

The guideline of 100 mcg/m^3 was issued in 1997 and was based on the toxicological data available at the time. Since then, many new toxicity studies have been published and the USEPA has completed a comprehensive, state-of-the-science, peer-reviewed risk assessment of PERC. Based on the risk assessment, the USEPA recommended values for evaluating the potential for noncancer and cancer effects from exposure to PERC in air [a RfC (40 mcg/m^3) and an air level (4 mcg/m^3) associated with an estimated excess cancer risk of one-in-one million, assuming continuous, lifetime exposure]. NYSDOH staff reviewed the USEPA risk assessment and determined that the recommended values are scientifically robust and should replace the values derived in 1997. The USEPA publication of its RfC (40 mcg/m^3) necessitated a re-evaluation of the health-protectiveness of the old NYSDOH guideline (100 mcg/m^3) because it has been the past practice of NYSDOH to set guidelines at air levels that are equal to or less than a RfC. Consequently, the guideline was reduced to 30 mcg/m^3 after consideration of new toxicity data (e.g., NYSDOH, 2010) and the USEPA risk assessment.

8. SHOULD I BE CONCERNED ABOUT HEALTH EFFECTS IF I AM EXPOSED TO AN AIR LEVEL SLIGHTLY ABOVE THE GUIDELINE?

The guideline is not a bright line between PERC levels that cause health effects and those that do not. The differences between exposure at the guideline and exposure levels known to cause effects in humans and animals are large. Thus, exposure to levels above but near the guideline will not cause health effects in most, if not all, people. In addition, the guideline is based on the assumption that people are continuously exposed to PERC in air all day, every day for as long as a lifetime. Continuous exposure is rarely true for most people, who, if exposed, are more likely to be exposed for a part of the day and part of their lifetime.

9. IS THERE A TEST TO DETERMINE WHETHER I HAVE BEEN EXPOSED TO PERC?

PERC levels can be measured in the breath for weeks following a high exposure to PERC because it is stored in body fat and is slowly released into the bloodstream and then exhaled in the breath. PERC can be measured in blood. Also, breakdown products of PERC can be detected in the blood and urine for several days after exposure to PERC. Because exposure to other chemicals can produce the same breakdown products in the urine and blood as PERC, the tests for breakdown products cannot determine if you have been exposed only to PERC. Although the tests can show if PERC levels in the body are elevated compared to background levels, they

cannot conclusively determine when and for how long a person was exposed, what the source of that exposure was, or whether or not the person will develop adverse health effects.

10. WHEN SHOULD MY CHILDREN OR I SEE A PHYSICIAN?

If you believe you or your children have symptoms that you think are caused by PERC exposure, you and your children should see a physician. You should tell the physician about the symptoms and about when, how, and for how long you think you and/or your children were exposed to PERC.

11. WHERE CAN I GET MORE INFORMATION?

If you have any questions about the information in this fact sheet, would like to know more about PERC, or are concerned that you may be exposed to elevated levels of PERC, please call the New York State Department of Health at 518-402-7800 or 1-800-458-1158, send an e-mail to btsa@health.state.ny.us, or write to us at the following address.

New York State Department of Health
Bureau of Toxic Substance Assessment
Corning Tower, Room 1743
Empire State Plaza,
Albany, NY 12237

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New York State Department of Health
Tenant Notification Fact Sheet for 1,2-Dichloroethene (1,2-DCE)

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

1,2-Dichloroethene (1,2-DCE)

1,2-Dichloroethene (also known as 1,2-dichloroethylene or 1,2-DCE) is a man-made volatile organic chemical. Its primary uses are as an industrial solvent and as an intermediate to make other chemicals. 1,2-Dichloroethene is also a breakdown product of trichloroethene in the environment. 1,2-Dichloroethene has two forms called *cis*-1,2-dichloroethene and *trans*-1,2-dichloroethene.

Sources of 1,2-DCE in Indoor Air

No household products are known to contain 1,2-DCE. One possible source of 1,2-DCE in indoor air is evaporation from contaminated well water that is used for household purposes. 1,2-DCE may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. 1,2-DCE has also been found at low concentrations in outdoor air, which can also be a source of the chemical in indoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of 1,2-DCE in indoor and outdoor air. Levels of 1,2-DCE in the indoor air of homes and office settings and in outdoor air are expected to be less than 1 microgram per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

There is limited information on the health effects of long term exposure to high levels of 1,2-DCE in humans. Some humans exposed to large amounts of this chemical over short periods of time have had nervous system effects including weakness, drowsiness, nausea, dizziness and loss of consciousness. Exposure to high concentrations of 1,2-DCE causes adverse effects on the liver, blood and immune system of laboratory animals. Taken together, the human and animal data suggest that long term human exposure to 1,2-DCE may increase the risk for changes in the blood, and for liver, immune system and nervous system toxicity.

Studies that evaluate whether exposure to 1,2-DCE can cause cancer in humans or laboratory animals are not available.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for 1,2-DCE in air. However, NYS DOH guidance for 1,2-DCE and other air contaminants is that reasonable and practical actions should be taken to reduce 1,2-DCE exposure when indoor air levels are above those typically found in indoor air. The urgency to take actions increases as indoor air levels increase. The 1,2-DCE exposure

levels that cause health effects in animals or humans are many times higher than levels typically found in indoor air.

Ways to Limit Exposure to 1,2-DCE in Indoor Air

In all cases, the specific actions to limit exposure to 1,2-DCE in indoor air depend on a case-by-case evaluation of the situation. Maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of 1,2-DCE entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring 1,2-DCE in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on 1,2-DCE, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at **www.health.state.ny.us/environmental/indoors/air/contaminants/**.

If you have further questions about 1,2-DCE and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

Soil Vapor / Indoor Air Matrix A
May 2017

Analytes Assigned:
Trichloroethene (TCE), *cis*-1,2-Dichloroethene (*c*12-DCE), 1,1-Dichloroethene (11-DCE), Carbon Tetrachloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)		
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 0.2	0.2 to < 1	1 and above
< 6	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	4. No further action	5. MONITOR	6. MITIGATE
60 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX A

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 0.20 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor / Indoor Air Matrix B
May 2017

Analytes Assigned:
Tetrachloroethene (PCE), 1,1,1-Trichloroethane (111-TCA), Methylene Chloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)		
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 3	3 to < 10	10 and above
< 100	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
100 to < 1,000	4. No further action	5. MONITOR	6. MITIGATE
1,000 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX B

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 1 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor/Indoor Air Matrix C

May 2017

Analytes Assigned:
Vinyl Chloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)	
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 0.2	0.2 and above
< 6	1. No further action	2. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	3. MONITOR	4. MITIGATE
60 and above	5. MITIGATE	6. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX C

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 0.20 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

The Dow Chemical Company
P.O. Box 8361
South Charleston, WV 25303-8361
USA

January 18, 2019

Mr. Michael Marshall
Johnson Machine & Fibre Products
142 Hopkins Avenue
Jamestown, New York 14701

Subject: Results of the Soil Vapor Intrusion Sampling Conducted at 142 Hopkins Avenue

Dear Mr. Marshall:

This letter has been prepared to provide the results of the soil vapor intrusion (SVI) evaluation performed on November 14, 2018 at 142 Hopkins Avenue. Additional soil vapor samples necessary to perform a SVI pathway assessment were collected between December 11 and 13, 2018 along the adjacent streets. The work was performed in association with ongoing investigations related to the Essex-Hope Superfund Site (Site ID No. 907015). This evaluation was performed with cooperation from the New York State Department of Environmental Conservation (NYSDEC) and New York State Department of Health (NYSDOH).

The sub-slab vapor sampling data were reviewed for accuracy, and validation of these results was completed on January 14, 2019. The results from samples collected from 142 Hopkins Avenue are included in Table 1 and the locations of the samples collected are provided on Figure 1. The results were screened against NYSDOH sub-slab vapor concentration criteria (which do not account for the differences between residences and commercial buildings) to determine if further action is needed. Results were also compared against calculated U.S. Environmental Protection Agency (EPA) commercial sub-slab vapor intrusion screening levels (VISLs).

Certain chemicals were detected in sub-slab soil vapor at the property. This letter is being provided in accordance with NYSDEC Law Article 27-2405 to provide timely notification. These results are being further evaluated to determine if additional actions are necessary.

Results and Evaluation

Sub-slab soil vapor samples were collected within the Johnson Machine & Fibre Products facility in November 2018 following the completion of building surveys conducted in April 2018. The surveys attempted to inventory chemicals present in the sampling areas that have the potential to affect air sample results. A summary of volatile organic compounds (VOCs) detected in the November 2018 sub-slab soil vapor samples is presented in Table 1; the sampling locations are identified on Figure 1.

Detected VOC concentrations in sub-slab vapor soil are evaluated against the following criteria (see Table 1):

1. Calculated EPA commercial VISLs (EPA, 2018).
2. NYSDOH sub-slab vapor concentrations criteria per *Guidance for Evaluating Soil Vapor Intrusion in the State of New York* (NYSDOH, 2006). A copy of the NYSDOH soil vapor/indoor air decision matrices is included in Attachment 1. Note that indoor air data are required to determine if any further action is needed as per the NYSDOH decision matrices.

Comparison to EPA VISLs and NYSDOH Air Guideline Values

Four sub-slab locations were sampled within the Johnson Machine & Fibre Products facility as shown on Figure 1, with the respective results listed in Table 1. At the time of sampling, the facility was occupied and in operation. Cis-1,2-dichloroethene (cis-1,2-DCE) and/or trichloroethene (TCE) were detected at concentrations greater than the most conservative NYSDOH soil vapor screening criteria at all four samples

collected directly beneath your facility. All other measured chemicals were not detected or were detected in concentrations under the applicable screening levels, as is the case for tetrachloroethene (PCE). There were no sub-slab soil vapor sample results in exceedance of the calculated EPA VISLs. Additional information on the chemicals of concern detected at the property is presented in Attachment 1.

Summary and Conclusions

Investigation activities conducted in November and December 2018 identified TCE and cis-1,2-DCE in sub-slab soil vapor at concentrations greater than NYSDOH soil vapor screening criteria. A comprehensive SVI pathway assessment is currently being performed and will be presented to NYSDEC and NYSDOH. We will inform you of any potential additional sampling efforts required to complete the SVI study at your facility.

We appreciate your cooperation for the duration of this project. If you would like to discuss these results, please contact me at 304.747.3763.

Sincerely,

Tim King
Authorized Representative

Enclosures
Table 1 – Detected Concentrations of Volatile Organic Compounds in Sub-slab Soil Vapor
Figure 1 – Soil Vapor Intrusion Investigation Locations
Attachment 1 – NYSDOH Fact Sheets and Information

References

New York State Department of Health (NYSDOH). 2006. *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*. October. Updated May 2017.

U.S. Environmental Protection Agency (EPA). 2013. *Office of Solid Waste and Emergency Response (OSWER) Final Guidance for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Sources to Indoor Air*. External Review Draft. April 11.

U.S. Environmental Protection Agency (EPA). 2018. VISLs Calculator for Commercial Sub-slab Vapor Intrusion Screening Level. November. https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator.

Table

TABLE 1

Detected Concentrations of Volatile Organic Compounds in Sub-slab Soil Vapor

142 Hopkins Avenue

LOCATION						JMF-01-20181114		JMF-01-20181114-FD		JMF-02-20181114		JMF-03-20181114		JMF-04-20181114	
SAMPLING DATE						11/14/2018		11/14/2018		11/14/2018		11/14/2018		11/14/2018	
SCREENING CRITERIA	NY-SSC-A	NY-SSC-B	NY-SSC-C	USEPA VISL	Units	Results	Qual	Results	Qual	Results	Qual	Results	Qual	Results	Qual
Volatile Organic Compounds (VOCs)															
Vinyl chloride	--	--	6	93	µg/m^3	1.27	U	1.26	U	1.1	U	1.17	U	1.16	U
1,1-Dichloroethene	6	--	--	29,000	µg/m^3	1.97	U	1.95	U	1.71	U	1.82	U	1.8	U
trans-1,2-Dichloroethene	--	--	--	--	µg/m^3	1.97	U	1.95	U	1.71	U	1.82	U	1.8	U
cis-1,2-Dichloroethene	6	--	--	--	µg/m^3	**6.78**		**6.22**		**4.4**		**11.2**		**8.45**	
Trichloroethene	6	--	--	100	µg/m^3	**17.8**		**17.5**		**13**		**23.1**		**21.5**	
Tetrachloroethene	--	100	--	1,600	µg/m^3	**10.4**		**9.9**		2.93	U	**8.68**		**14.9**	

Notes:

µg/m^3 = micrograms per cubic meter

FD = Field Duplicate Sample

Qual = Laboratory data qualifier

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

NY-SSC-A: NYSDOH Matrix A Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, updated May 2017.

NY-SSC-B: NYSDOH Matrix B Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, updated May 2017.

NY-SSC-C: NYSDOH Matrix C Sub-slab Vapor Concentrations Criteria per Guidance for Evaluating Soil Vapor Intrusion, October 2006, updated May 2017.

EPA VISL: Calculated EPA Commercial Sub-slab Vapor Intrusion Screening Level, November, 2018 (TCR = 1x10-6 ; Q=1) available at https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator

Bold results indicate detection of chemical above the detection limit.

Exceeds NY-SSC

Figure



Sanitary Sewer Location

Storm Sewer Location

Soil Vapor Sample Location

Subslab Vapor Sample Location

Sanitary/Storm Sewer

Approximate Site Boundary

Parcels

Access to Rollform was Denied and therefore sampling has not been proposed at this time

Chadakoin River

Notes:
1. Yellow highlighted cells: Exceeds NY-SSC, but indoor air data is required to determine if any further action is needed per the matrix.
2. Red text within cells: Exceeds USEPA Sub-slab Vapor Intrusion Screening Level

N

BASE MAP SOURCE:

0 25 50 100

Scale in Feet

Essex Specialty Products, Inc	Essex/Hope Site, Jamestown, New York

FIGURE 1
Soil Vapor Intrusion Investigation Locations
Off-site Vapor Intrusion Investigation Work Plan

CREATED BY: LA	JACOBS
REVIEWED BY: AS	

\\hrocksstefiles\GIS_SHARE\ENVIRO\00_Proj\DI\Dow_Chemical\Jamestown\Mapfiles\VI\2019\DoubMS_FigX_VI_SevenGas_AnalyticalData_Nov2018.mxd lallan 1/8/2019

Attachment 1
NYSDOH Fact Sheets and Information

Bureau of Toxic Substance Assessment
New York State Department of Health
August 2015

IMPORTANT INFORMATION ON TRICHLOROETHENE (TCE) IN INDOOR AND OUTDOOR AIR[1]

Trichloroethene (TCE)

Trichloroethene (also known as trichloroethylene or TCE) is a human-made chemical. It is volatile, meaning it readily evaporates at room temperature into the air, where you can sometimes smell it. It is used as a solvent to remove grease from metal, a paint stripper, an adhesive solvent, an ingredient in paints and varnishes, and in the manufacture of other chemicals and products (for example, furniture and electric/electronic equipment).

Exposure to TCE

People may be exposed to TCE in air, water, and food, or when TCE or material containing TCE (for example, soil) gets on the skin. For most people, almost all TCE exposure is from indoor air.

Sources of TCE in Air

TCE may get into indoor air when TCE-containing products (for example, glues, adhesives, paint removers, spot removers, and metal cleaners) are used. Another source could be evaporation from contaminated well water that is used for household purposes. TCE may enter homes through soil vapor intrusion, which occurs when TCE evaporates from contaminated groundwater, enters soil vapor (air spaces between soil particles), and migrates through cracks or other openings in the foundation and into the building. TCE gets into outdoor air when it is released from industrial facilities and when it evaporates from areas where chemical wastes are stored or disposed.

Levels Typically Found in Air

The background indoor air levels of TCE in homes and office buildings not near known environmental sources of TCE are almost always 1 microgram per cubic meter of air (1 mcg/m^3) or less. Background outdoor air levels also are almost always 1 mcg/m3 or less.

Health Risks Associated with Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans (for example, workplace air levels 90,000 to 800,000 mcg/m^3). TCE exposure can cause effects on the central nervous system, liver, kidneys, and immune system of humans. TCE exposure is

[1] For a more technical discussion of this information, see the fact sheet "Trichloroethene (TCE) In Indoor and Outdoor Air" available at http://www.health.ny.gov/environmental/chemicals/trichloroethene/.

associated with reproductive effects in men and women, and may affect fetal development during pregnancy. However, the studies suggest, but do not prove, that the reproductive and developmental effects were caused by TCE, and not by some other factor. The United States Environmental Protection Agency (USEPA) classifies TCE as a chemical that causes cancer in humans by all routes of exposure. Whether a person experiences a health effect depends on how much of the chemical he or she is exposed to, how often the exposure occurs, and how long the exposures last. Individual characteristics such as age, health, lifestyle, and genetics also play a role.

The New York State Department of Health (NYSDOH) Guideline for TCE in Air

NYSDOH recommends that TCE levels in air not exceed 2 mcg/m^3. This replaces the previous guideline of 5 mcg/m^3. The guideline was set at an air level that is lower than levels known to cause, or suspected of causing, health effects in humans, including sensitive populations (for example, children, pregnant women) and animals. The guideline is based on the assumption that people are continuously exposed to TCE in air all day, every day for months or as long as a lifetime. Continuous exposure is rarely true for most people, who, if exposed, are more likely to be exposed for a part of the day, part of a week, or part of their lifetime.

The guideline is used to help guide decisions regarding the urgency of efforts to reduce TCE exposure. At TCE air levels above the guideline, the higher the level, the greater the urgency to take action to reduce exposure. But as with any chemical in indoor air, the NYSDOH always recommends taking action to reduce exposure when the air concentration of a chemical is above background, even if it is below the guideline.

Indoor air concentrations substantially above the guideline clearly indicate a significant TCE source and the need for action to reduce exposure. In particular, NYSDOH has concerns about exposure during pregnancy, particularly during the first trimester, to air concentrations higher than 20 mcg/m^3 because the major steps of heart development occur during this period and TCE may be a risk factor for fetal heart defects in humans. Thus, NYSDOH recommends taking immediate and effective action to reduce exposure when an air concentration is equal to, or above 20 mcg/m^3. In all cases, the specific recommended action depends on a case-by-case evaluation of the situation.

Concerns about Exposure to TCE

Most people, if exposed to TCE, are exposed to air levels much lower than those known to cause health effects in humans. However, if you are concerned that you, your children, or others have been exposed to TCE, discuss your symptoms/signs with your health care provider. There are special tests to measure TCE and related chemicals in your blood, breath, or urine, and your health care provider can compare the results to those of people without known exposure to TCE or to workers with high exposure to TCE.

Questions

If you have any questions about the information in this fact sheet, would like to know more about TCE, or are concerned that you may be exposed to elevated levels of TCE, please call the New York State Department of Health at 1-518-402-7800 or 1-800-458-1158, send an e-mail to btsa@health.ny.gov, or write to the following address.

New York State Department of Health
Bureau of Toxic Substance Assessment
Corning Tower, Room 1743
Empire State Plaza,
Albany, NY 12237

New York State Department of Health
Tenant Notification Fact Sheet for 1,2-Dichloroethene (1,2-DCE)

This fact sheet is provided to fulfill New York State Department of Health (NYS DOH) requirements for preparation of generic fact sheets under Article 27 (Title 24, Section 27-2405) of the Environmental Conservation Law.

1,2-Dichloroethene (1,2-DCE)

1,2-Dichloroethene (also known as 1,2-dichloroethylene or 1,2-DCE) is a man-made volatile organic chemical. Its primary uses are as an industrial solvent and as an intermediate to make other chemicals. 1,2-Dichloroethene is also a breakdown product of trichloroethene in the environment. 1,2-Dichloroethene has two forms called *cis*-1,2-dichloroethene and *trans*-1,2-dichloroethene.

Sources of 1,2-DCE in Indoor Air

No household products are known to contain 1,2-DCE. One possible source of 1,2-DCE in indoor air is evaporation from contaminated well water that is used for household purposes. 1,2-DCE may also enter homes through soil vapor intrusion, which occurs when the chemical evaporates from groundwater, enters soil vapor (air spaces between soil particles), and migrates through building foundations into the building's indoor air. 1,2-DCE has also been found at low concentrations in outdoor air, which can also be a source of the chemical in indoor air.

Levels Typically Found in Air

The NYS DOH reviewed and compiled information from studies in New York State as well as from homes and office buildings across the United States on typical levels of 1,2-DCE in indoor and outdoor air. Levels of 1,2-DCE in the indoor air of homes and office settings and in outdoor air are expected to be less than 1 microgram per cubic meter (mcg/m^3).

Health Risks Associated with Exposure

There is limited information on the health effects of long term exposure to high levels of 1,2-DCE in humans. Some humans exposed to large amounts of this chemical over short periods of time have had nervous system effects including weakness, drowsiness, nausea, dizziness and loss of consciousness. Exposure to high concentrations of 1,2-DCE causes adverse effects on the liver, blood and immune system of laboratory animals. Taken together, the human and animal data suggest that long term human exposure to 1,2-DCE may increase the risk for changes in the blood, and for liver, immune system and nervous system toxicity.

Studies that evaluate whether exposure to 1,2-DCE can cause cancer in humans or laboratory animals are not available.

NYS DOH Air Guideline

The NYS DOH has not established a chemical-specific guideline for 1,2-DCE in air. However, NYS DOH guidance for 1,2-DCE and other air contaminants is that reasonable and practical actions should be taken to reduce 1,2-DCE exposure when indoor air levels are above those typically found in indoor air. The urgency to take actions increases as indoor air levels increase. The 1,2-DCE exposure

levels that cause health effects in animals or humans are many times higher than levels typically found in indoor air.

Ways to Limit Exposure to 1,2-DCE in Indoor Air

In all cases, the specific actions to limit exposure to 1,2-DCE in indoor air depend on a case-by-case evaluation of the situation. Maintaining adequate ventilation will usually help reduce indoor air levels of the chemical. A sub-slab depressurization system can reduce the amount of 1,2-DCE entering indoor air by soil vapor intrusion. Use of an activated carbon filter on the water supply can reduce the amount of the chemical in contaminated well water that could evaporate into indoor air.

Reportable Detection Level

The reportable detection level for a chemical can vary depending on the analytical method used, the laboratory performing the analysis, and several other factors. Most laboratories that use the analytical methods recommended by the NYS DOH for measuring 1,2-DCE in air (and approved by the National Environmental Laboratory Accreditation Conference or New York State's Environmental Laboratory Approval Program) can routinely detect the chemical at concentrations below 1 mcg/m^3.

Additional Information

Additional information on 1,2-DCE, ways to reduce exposure, indoor air contamination resulting from soil vapor intrusion, indoor and outdoor air levels and the Environmental Conservation Law can be found on the NYS DOH website at **www.health.state.ny.us/environmental/indoors/air/contaminants/**.

If you have further questions about 1,2-DCE and the information in this fact sheet, please call the NYS DOH at 1-518-402-7800 or 1-800-458-1158 (extension 2-7800), e-mail to **ceheduc@health.state.ny.us**, or write to the following address:

New York State Department of Health
Center for Environmental Health
Outreach and Education Group
Empire State Plaza-Corning Tower, Room 1642
Albany, New York 12237

New York State Department of Health
January, 2014

Soil Vapor / Indoor Air Matrix A
May 2017

Analytes Assigned:
Trichloroethene (TCE), *cis*-1,2-Dichloroethene (*c*12-DCE), 1,1-Dichloroethene (11-DCE), Carbon Tetrachloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)		
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 0.2	0.2 to < 1	1 and above
< 6	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	4. No further action	5. MONITOR	6. MITIGATE
60 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX A

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 0.20 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor / Indoor Air Matrix B
May 2017

Analytes Assigned:
Tetrachloroethene (PCE), 1,1,1-Trichloroethane (111-TCA), Methylene Chloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)		
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 3	3 to < 10	10 and above
< 100	1. No further action	2. No Further Action	3. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
100 to < 1,000	4. No further action	5. MONITOR	6. MITIGATE
1,000 and above	7. MITIGATE	8. MITIGATE	9. MITIGATE

No further action: No additional actions are recommended to address human exposures.

Identify Source(s) and Resample or Mitigate: We recommend that reasonable and practical actions be taken to identify the source(s) affecting the indoor air quality and that actions be implemented to reduce indoor air concentrations to within background ranges. For example, if an indoor or outdoor air source is identified, we recommend the appropriate party implement actions to reduce the levels. In the event that indoor or outdoor sources are not readily identified or confirmed, resampling (which might include additional sub-slab vapor and indoor air sampling locations) is recommended to demonstrate that SVI mitigation actions are not needed. Based on the information available, mitigation might also be recommended when soil vapor intrusion cannot be ruled out.

Monitor: We recommend monitoring (sampling on a recurring basis), including but not necessarily limited to sub-slab vapor, basement air and outdoor air sampling, to determine whether concentrations in the indoor air or sub-slab vapor have changed and/or to evaluate temporal influences. Monitoring might also be recommended to determine whether existing building conditions (e.g., positive pressure heating, ventilation and air-conditioning systems) are maintaining the desired mitigation endpoint and to determine whether changes are needed. The type and frequency of monitoring is determined based on site-, building- and analyte-specific information, taking into account applicable environmental data and building operating conditions. Monitoring is an interim measure required to evaluate exposures related to soil vapor intrusion until contaminated environmental media are remediated.

Mitigate: We recommend mitigation to minimize current or potential exposures associated with soil vapor intrusion. The most common mitigation methods are sealing preferential pathways in conjunction with installing a sub-slab depressurization system and changing the pressurization of the building in conjunction with monitoring. The type, or combination of types, of mitigation is determined on a building-specific basis, taking into account building construction and operating conditions. Mitigation is considered a temporary measure implemented to address exposures related to soil vapor intrusion until contaminated environmental media are remediated.

These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX B

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

[1] The matrix is generic. As such, it may be appropriate to modify a recommended action to accommodate analyte-specific, building-specific conditions (e.g., dirt floor in basement, crawl spaces, thick slabs, current occupancy, etc.), and/or factors provided in Section 3.2 of the guidance (e.g., current land use, environmental conditions, etc.). For example, collection of additional samples may be recommended when the matrix indicates "no further action" for a particular building, but the results of adjacent buildings (especially sub-slab vapor results) indicate a need to take actions to address exposures related to soil vapor intrusion. Mitigation might be recommended when the results of multiple contaminants indicate monitoring is recommended. Proactive actions may be proposed at any time. For example, the party implementing the actions may decide to install sub-slab depressurization systems on buildings where the matrix indicates "no further action" or "monitoring." Such an action might be undertaken for reasons other than public health (e.g., seeking community acceptance, reducing costs, etc.). However, actions implemented *in lieu* of sampling will typically be expected to be captured in the final engineering report and site management plan, and might not rule out the need for post-implementation sampling (e.g., to document effectiveness or to support terminating the action).

[2] Actions provided in the matrix are specific to addressing human exposures. Implementation of these actions does not preclude investigating possible sources of soil vapor contamination, nor does it preclude remediating contaminated soil vapor or the source of soil vapor contamination.

[3] Appropriate care should be taken during all aspects of sample collection to ensure that high quality data are obtained. Since the data are being used in the decision-making process, the laboratory analyzing the environmental samples must have current Environmental Laboratory Approval Program (ELAP) certification for the appropriate analyte and environmental matrix combinations. Furthermore, samples should be analyzed by methods that can achieve a minimum reporting limit of 1 microgram per cubic meter for indoor and outdoor air samples. For sub-slab vapor samples and dirt floor soil vapor samples, a minimum reporting limit of 1 microgram per cubic meter is recommended.

[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

[5] When current exposures are attributed to sources other than soil vapor intrusion, the agencies should be given documentation (e.g., applicable environmental data, completed indoor air sampling questionnaire, digital photographs, etc.) to support a proposed action other than that provided in the matrix box and to support agency assessment and follow-up.

[6] The party responsible for implementing the recommended actions will differ depending upon several factors, including but not limited to the following: the identified source of the volatile chemicals, the environmental remediation program, and analyte-specific, site-specific and building-specific factors.

Soil Vapor/Indoor Air Matrix C

May 2017

Analytes Assigned:
Vinyl Chloride

	INDOOR AIR CONCENTRATION of COMPOUND (mcg/m^3)	
SUB-SLAB VAPOR CONCENTRATION of COMPOUND (mcg/m^3)	< 0.2	0.2 and above
< 6	1. No further action	2. IDENTIFY SOURCE(S) and RESAMPLE or MITIGATE
6 to < 60	3. MONITOR	4. MITIGATE
60 and above	5. MITIGATE	6. MITIGATE

No further action: No additional actions are recommended to address human exposures.

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These general recommendations are made with consideration being given to the additional notes on page 2.

ADDITIONAL NOTES FOR MATRIX C

This matrix summarizes actions recommended to address current and potential exposures related to soil vapor intrusion. To use the matrix appropriately as a tool in the decision-making process, the following should be noted:

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[4] Sub-slab vapor and indoor air samples are typically collected when the likelihood of soil vapor intrusion is considered to be the greatest (i.e., worst-case conditions). If samples are collected at other times (typically, samples collected outside of the heating season), then resampling during worst-case conditions might be appropriate to verify that actions taken to address exposures related to soil vapor intrusion are protective of human health.

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