

INDOOR AIR SOIL VAPOR INTRUSION STUDY REPORT

**12 Wright Avenue
Merrimack, NH
New Hampshire Plating Company
Superfund Site**

**U.S. ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND REGIONAL LABORATORY
OFFICE OF ENVIRONMENTAL MEASUREMENT & EVALUATION
11 TECHNOLOGY DRIVE
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Prepared for: Office of Site Remediation & Restoration, Remedial Program
U.S. Environmental Protection Agency, New England


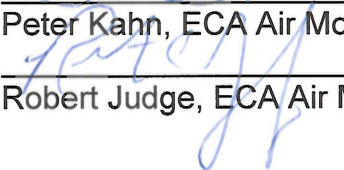
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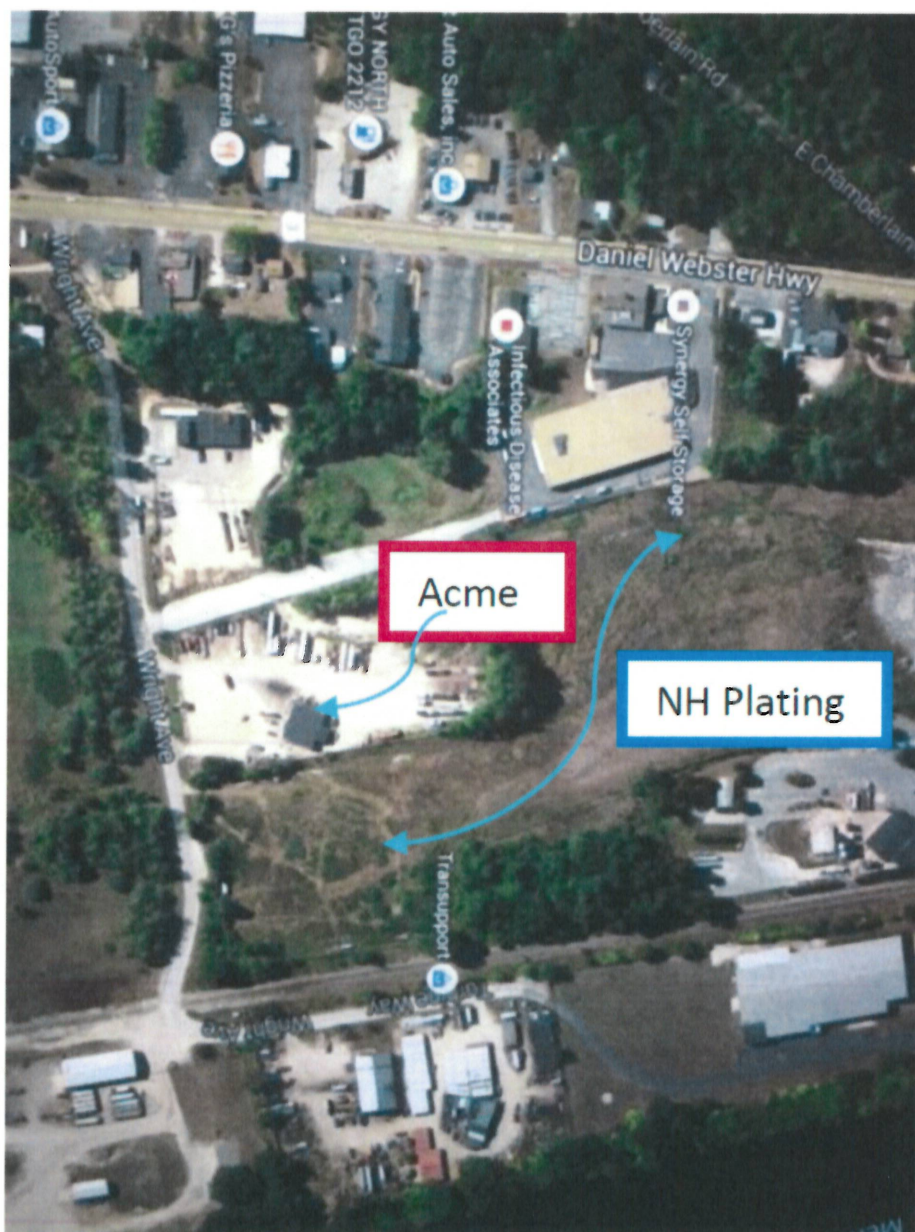
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1.0 Introduction

On February 1, 2017, at the request of EPA Remedial Project Manager (RPM), Cheryl Sprague, the EPA Region I Office of Environmental Measurement and Evaluation (OEME) collected and analyzed indoor air and sub-slab soil gas samples inside a commercial building located at 12 Wright Avenue in Merrimack, NH, adjacent to the New Hampshire Plating Company (NHPC) property. An aerial map showing the site and building where sampling was performed are shown on figure 1. To evaluate vapor intrusion, sub-slab soil gas, indoor air and ambient air samples were collected to form lines of evidence for completion of a vapor intrusion pathway risk evaluation related to contaminants associated with the New Hampshire Plating Company Superfund Site.

Figure 1



Peter Kahn was the EPA sampling project manager for this study and was responsible for the following tasks: preparing the Sampling and Analysis Plan (SAP), communicating with the RPM, coordinating EPA laboratory analytical support, installing sub-slab soil-gas probes, collecting ambient outside and inside air samples, and preparing the final report. Alysha Thompson assisted with sample collection and documentation. Scott Clifford was responsible for collecting indoor air and sub-slab soil gas samples, and on-site screening analysis of these samples using the EPA Region 1 Mobile Laboratory. Dan Curran performed the laboratory analysis of all samples collected, including soil-gas samples, which were collected in canisters.

1.1 Site Description and Background

Site Description

The NHPC property is located on Wright Avenue, off the Daniel Webster Highway in Merrimack, New Hampshire. The 13-acre parcel is enclosed by an 8-foot-high chain-link security fence and is situated in an area with mixed land use, including light industries, commercial businesses, and a few private residential dwellings. The study area of the NHPC Superfund Site includes the NHPC property and the surrounding properties as follows:

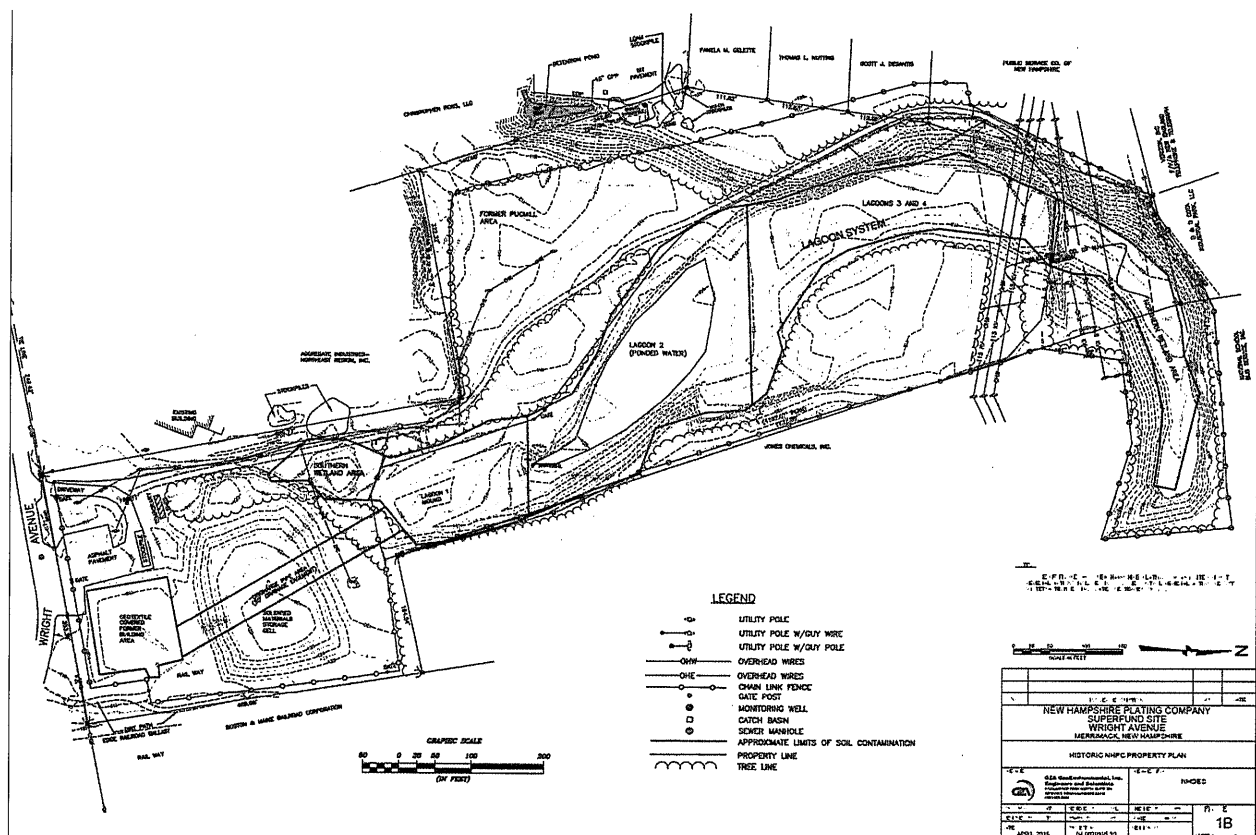
- To the south by Wright Avenue and beyond by a property owned by the Young Men's Christian Association;
- To the southwest by ACME Pressure Washing (formerly Aggregate Industries);
- To the east by Jones Chemical, Inc., (JCI) property and a railroad right-of-way; and beyond by Transupport, Inc. and Windsor Industries (Lot 22 owned by Combat Corp and Lot 22-1 owned by Equivise Ltd.); and
- To the southeast by the New England Pole and Wood Treating Company property.
- Cota Industrial Park and the National School Bus Service, Inc. property adjoin the NHPC property to the north and Synergy Self Service adjoins the property to the west; however, these properties are situated up gradient of the Site, and not included within the study area.

The NHPC property is located on a broad stream terrace along the western bank of the Merrimack River, which is situated approximately 500 feet toward the east. Horseshoe Pond, an oxbow lake associated with the Merrimack River, is a recreational water body located on the southern boundary of the Site, approximately 600 feet south of the NHPC property. A majority of the NHPC Site is located within the 100-year floodplain, which considers a base flood elevation of 119 feet (U.S. Department of Housing and Urban Development, 1979).

Brief Site History

NHPC operated an electroplating facility on the property from 1962 to 1985. The metals used in the electroplating process included cadmium, zinc, chromium, copper, lead, nickel, tin, gold, silver, aluminum, iron, and manganese. Cyanide was also used in part of the electroplating process. NHPC also used chlorinated organic solvents for de-greasing including: trichloroethylene (TCE); 1,1,1-trichloroethane (TCA); and tetrachloroethylene (PCE). Chlorinated solvent use was reportedly discontinued during the latter part of the 1970s.

Treated and untreated wastes and wastewater were discharged through a gravity-drained underground discharge pipe into unlined waste lagoons located approximately 325 feet north of the former NHPC building. These former lagoons occupied wetlands that developed naturally in a series of meander scars formed by the Merrimack River. Wastes were discharged directly into a primary infiltration lagoon (Lagoon 1). The lagoon system was constructed to allow the discharged wastes to overflow from the primary lagoon into a secondary infiltration lagoon (Lagoon 2) and into subsequent overflow lagoons (Lagoons 3 and 4) during periods of high discharge from the facility. Approximately 35,000 to 60,000 gallons of wastewater were generated and discharged to the lagoons each day.



REMEDY: An ROD was issued in 1998 that identified the selected remedy to address the Site's contaminated soils and sediments and provided for the long-term monitoring of the Site's groundwater quality. The remedy involved in-place treatment of metal-contaminated soil by chemical fixation, natural attenuation of contaminated groundwater in the overburden hydrogeologic units, and institutional controls to allow for acceptable re-development and prevent future ingestion of contaminated groundwater.

Contamination in groundwater: Eight VOCs were detected in groundwater at concentrations which exceeded the federal MCLs. These included: TCE, 1,1-dichloroethene (1,1-DCE); PCE; vinyl chloride (VC); TCA; cis- and trans-1,2-dichloroethene (cis- and trans-DCE, respectively); 1,2-dichloroethane; and chloroform. Five metals were also detected in the groundwater above the established MCLs, including cadmium, nickel, chromium, arsenic, and lead. TCE and cadmium were the contaminants that most frequently exceeded their respective MCLs of five micrograms per liter ($\mu\text{g/L}$).

Distribution of Chlorinated Volatile Organic Compounds in Groundwater

The concentrations and distribution of dissolved-phase TCE and the direction of groundwater flow have historically suggested limited residual free-phase TCE to be present on the Site. There are three known areas of persistent dissolved-phase VOCs within the overburden. The primary source area of TCE is understood to have been located within former Lagoon 1 area, with contaminants transported laterally to the southeast, south, and southwest, and vertically downward through fine-grained lacustrine deposits into the deep overburden. Dissolved phase contaminants have migrated in groundwater from the former on-site lagoons and building source areas, under adjacent properties and to the Merrimack River east of the Site. These dissolved phase contaminants in groundwater have also migrated south toward Horseshoe Pond. The understanding of Site conditions assumes residually VOC contaminated soil present within fine-grained lacustrine deposits are likely a continuing source of contamination to deep overburden groundwater.

Overburden Groundwater Quality and Potential for Vapor Intrusion

The high concentration TCE in groundwater at the Site has typically been around 100 $\mu\text{g/L}$ and detected at well NHP_MW-302S (119 $\mu\text{g/L}$ during 2014). Concentrations of TCE greater than 100 $\mu\text{g/L}$ (up to 1,500 $\mu\text{g/L}$) were recently detected as far north as NHP_GP-114, east as NHP_GP-109, south as NHP_GP-132, and west as NHP_GP-125.

TCE was detected at concentrations exceeding the New Hampshire category GW-2 groundwater standard (20 $\mu\text{g/L}$) for potential vapor intrusion to indoor air within 100 vertical and horizontal feet of the building located on the Acme Power Washing property. The highest concentration (1,500 $\mu\text{g/L}$) was detected at NHP_GP-118 located approximately 17.9 feet bgs and approximately 40 feet south of the Acme building (data table provided in email). This observation of cVOCs in groundwater, having migrated at high concentrations west of the Site property, and onto the Acme property, is not consistent with the limits of the contaminant plume understood at the time of the ROD. Groundwater contamination extending to the west as far as NHP_GP-125 suggests that

the cVOC plume in groundwater has expanded and migrated off-site, and that natural attenuation has not been successful in reducing concentrations nor minimizing the off-site migration of contaminants.

The area potentially impacted by free-phase residual TCE contamination (based on the observed dissolved phase concentrations nearing 1% of the solubility of TCE) appears to extend toward the north to well couplet NHP_MW-304 and toward the west to the western edge of the Acme Pressure Washing property. The southern and eastern extents have not yet been delineated; however, based on the results of this investigation, they are anticipated to extend a significant distance off of the NHPC property both toward the east and the south.

As these higher-permeability, water-bearing units (i.e., the shallow alluvium and deep glacial outwash) are influenced more significantly by local characteristics responsible for elevated DO conditions, NA conditions are not well supported (i.e., a persistent, strongly NA-inhibiting condition appears to exist in these units) and additional investigations as to the potential vapor intrusion risks and remedial actions to address this TCE plume are being proposed by the Agency.

Recommendations

Based on the TCE concentrations observed in the shallow overburden that exceeded the New Hampshire category GW-2 groundwater standard for potential vapor intrusion to indoor air within 100 vertical and horizontal feet of the building located on the adjoining Acme Power Washing property, the remedy may not currently be protective of human health.

Recommendation is that an evaluation of the vapor intrusion pathway be conducted at the adjoining Acme Power Washing property, and should the pathway be complete, risks should be evaluated and an alternative remedy should be implemented in this area of the Site to address this risk until groundwater related remedial decisions can be evaluated.





Approx. location of 1.5 ppm TCE in groundwater

2.0 Sampling Objective

The building located at 12 Wright Avenue is divided into two sections, the east side is occupied by Acme Pressure Washing and by a truck repair shop on the west side. The building itself is one story, constructed on a slab-on-grade concrete foundation with cinder block walls. There are two areas on the Acme Pressure Washing side of the building where the concrete slab has been cut away, which are potential vapor intrusion points of entry. Indoor air samples were collected over an eight-hour period from the buildings western portion and from the eastern portion near one of the slab cut out areas. Indoor air data will be compared to an 8-hour background outdoor air sample that was collected outside the building along the fence line separating the NHPC and the 12 Wright Avenue properties. For quality control purposes, a collocated canister sample was collected from the eastern side of the building. All samples were collected over 8-hours to represent a normal work day. Indoor air sampling locations are shown on figure 2.

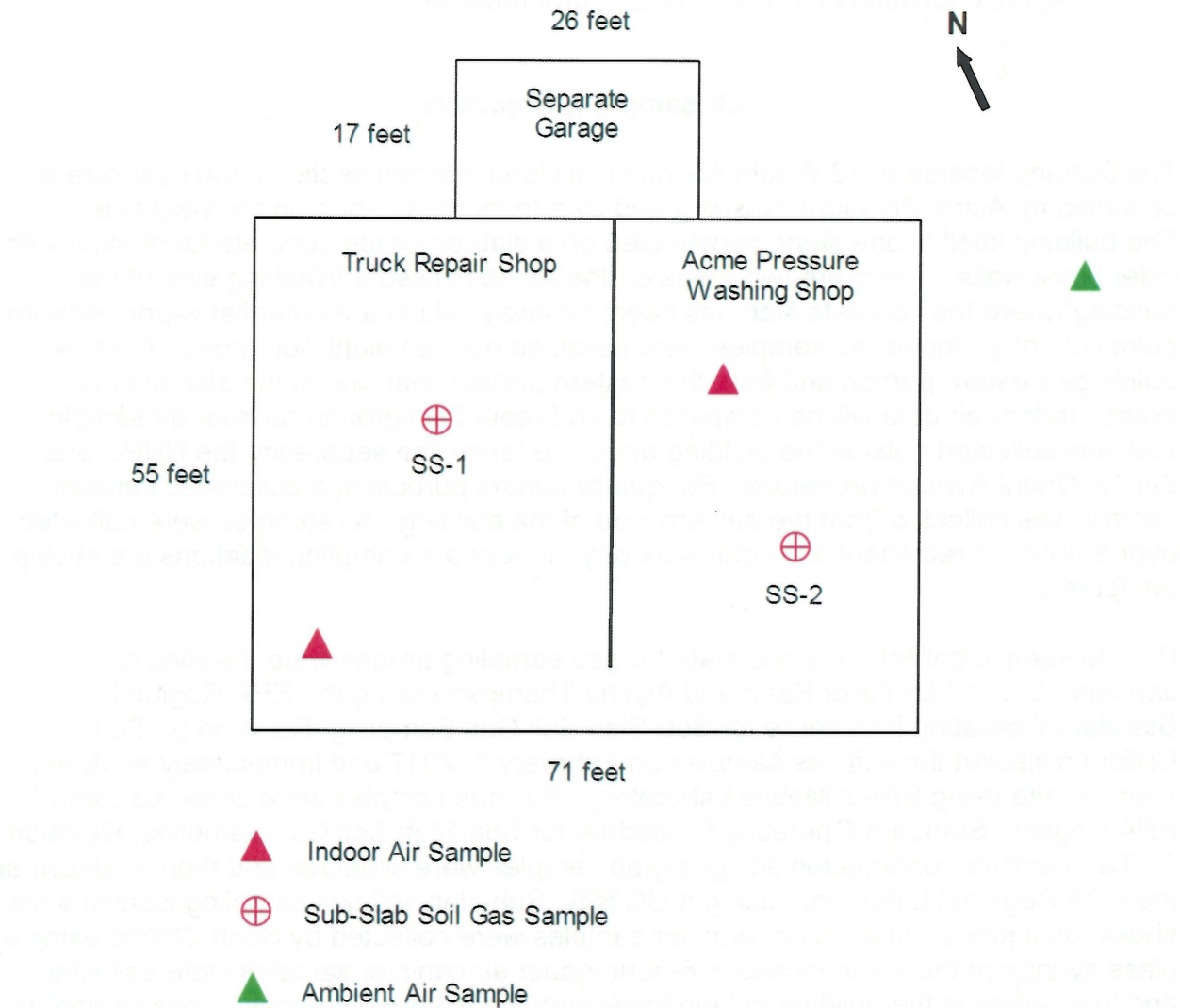
Prior to sample collection, 2 sub-slab soil gas sampling probes were installed on January 12, 2017 by Peter Kahn and Alysha Thompson using the EPA Region I Standard Operating Procedure for Sub-Slab Soil Gas Sampling, Revision 3. Scott Clifford collected the soil gas samples on February 1, 2017 and immediately analyzed them on-site using EPA's Mobile Laboratory. Soil gas samples were collected using EPA Region I Standard Operating Procedure for Sub-Slab Soil Gas Sampling, Revision 3. Two canister confirmation soil gas grab samples were collected and then analyzed at the EPA Regional Laboratory using a GC/MS. Sub-slab soil gas sampling locations are shown on figure 2. In addition, grab air samples were collected by Scott Clifford using a glass syringe at the same locations 8-hour indoor air canister samples were collected and from areas in the building to help investigate background sources. These samples were all analyzed on-site in the mobile lab.

All canister samples will be analyzed for the VOCs listed on Table 1, particularly the

contaminants of concern (COCs) trichloroethene (TCE), tetrachloroethene (PCE), 1, 1, 1-trichloroethane (1, 1, 1-TCA), 1,1-dichloroethene (1,1-DCE), 1, 2-dichloroethene (1, 2-DCE), 1, 2-dichloroethane (1, 2-DCA) and vinyl chloride (VC) using a GC/MS. These COCs have been detected in shallow groundwater and have the greatest potential to volatilize from groundwater and migrate into building above the groundwater plume as a gas.

Figure 2

**Vapor Intrusion Study
12 Wright Avenue Merrimack, NH
February 1, 2017**



Scale: 1 inch = 20 feet

2.1 Data Use and Reporting

The results of the study are presented in this report and will be provided to the EPA RPM for review and distribution (as necessary) to EPA risk assessor, property owner and the NH DES. This report describes where samples were collected and the sampling and analytical procedures used. In addition, all sampling and quality assurance/quality control (QA/QC) data are also contained in this report. The data reported by the EPA Laboratory were further validated following the QC criteria described in Section 3.4. The data will be used to evaluate whether indoor air quality has been adversely impacted by contaminants associated with the NHPC site and whether mitigation measures may be warranted. All canister samples were analyzed for the VOCs listed in Table 1, particularly the COCs TCE, PCE, 1, 1, 1-TCA, 1,1-DCE, 1, 2-DCE, 1, 2-DCA and VC using a GC/MS.

3.0 Canister VOC Air Sampling and Analytical Methodologies

3.1 Description

EPA Region I Standard Operating Procedure (SOP) for Canister Sampling, ECASOP-Canister Sampling SOP, Revision 6, was used to collect the indoor and ambient air samples. Eight hour time-weighted average (TWA) indoor air and ambient air samples were collected in evacuated 6-liter canisters using mechanical flow controllers, following the procedures described in the Region I SOP.

The TWA indoor air and ambient air samples were collected using a 6-liter canister with a mechanical flow controller calibrated to 10 ml/min to obtain 8-hour samples. At the end of the sampling period, the final canister pressure should be below atmospheric pressure, indicated on the pressure gauge as a negative value, indicative of a vacuum for the sample duration. For this study, the final canister pressures at the end of the sample period were between -8 and -14 inches of mercury. As a result, the data collected are representative of 8-hour average concentrations.

The 8-hour indoor air and ambient air samples were brought back to the EPA laboratory, logged in on 2/2/17, and analyzed on February 7, 2017, following the EPA Region I Standard Operating Procedure, EIASOP AIRCAN12. This analytical procedure was used to identify and quantify VOCs listed in Table 1. Prior to analyzing the canisters, they were pressurized with nitrogen. Typically where VOCs are present [in groundwater], indoor air and soil gas concentrations can be higher than outside ambient air. Frequently dilutions are made to keep concentrations of contaminants within the calibration range. As a result, a dilution factor is calculated and applied to the data. When dilutions are made to samples, the compound reporting limits are increased.

3.2 Canister Cleaning and Leak Certification Procedures

3.2.1 Canister Cleaning Procedure

Prior to the sampling event, all the canisters were cleaned by placing them in ovens

maintained at 100°C, evacuated to at least 10^{-2} Torr and then pressurized with humidified nitrogen to approximately 30 psig. This process was repeated three times. Detailed descriptions of these procedures are provided in the document entitled, Canister Cleaning and Leak Certification Standard Operating Procedures, ECASOP-Canister Cleaning and Leak Certification SOP1, 1/6/16, Revision 1.

3.2.2 Canister Leak Certification Procedure

After the canisters have been cleaned and they have been left overnight to equilibrate to room temperature, they are ready for the leak certification procedure. A MKS Baratron Pressure Gauge, model 122A was used to measure the pressure in the canister and a MKS PDR-C-1C Meter was used to display the pressure reading during the leak certification process. An initial pressure measurement was recorded and a final pressure is made after a minimum of 24 hours and the difference between the initial and final measurement was calculated to determine if the canister is leaking. Leak certification ensures the valves and connections associated with the canister do not leak. This prevents cross contamination or loss of sample during transport to the field and back to the laboratory. Detailed descriptions of these procedures are provided in the document entitled, Canister Cleaning and Leak Certification Standard Operating Procedures, ECASOP-Canister Cleaning and Leak Certification SOP1, 1/6/16, Revision 1.

3.2.3 Canister Cleanliness Certification Procedure

After all the canisters were certified leak free, each canister was analyzed for contamination using the same GC/MS used to analyze the samples. Clean certified canisters were stored under pressure until January 31, 2017, when they were evacuated to less than 3.4×10^{-2} Torr. Detailed descriptions of these procedures are provided in the document entitled, Canister Evacuation Standard Operating Procedures, ECASOP-Canister Evacuation SOP4, September 19, 2011, Revision 4.

3.3 Canister Flow Controller Cleaning and Calibration Procedures

3.3.1 Flow Controller Calibration Procedure

Flow controllers to be used with the 6-liter canisters were calibrated at the EPA laboratory to 10 ml/min to obtain 8-hour samples following the procedures provided in the EPA Region I SOP for Canister Sampling, ECASOP-Canister Sampling SOP, Revision 6, Section 14.1. Each flow controller was connected to a “dummy” evacuated canister and an Aalborg Electronic Mass Flow Meter, Model GFMs-010020, was attached to the flow controller’s inlet port. As room air was drawn into the “dummy” canister, the flow controller needle valve was adjusted until the flow rate was maintained at the desired rate.

In the field, each canister pressure was checked prior to and after the sampling event with a dedicated pressure/vacuum gauge. For this study the final canister pressures for the 8-hour samples were between -8 and -14 inches of mercury vacuum. These final pressure readings confirm that the data are representative of 8-hour average

concentrations.

3.3.2 Flow Controller Cleaning Procedure

After the flow controllers were calibrated they were cleaned following the procedures provided in the EPA Region I SOP for Flow Controller Cleaning Standard Operating Procedures, ECASOP- Flow Controller Cleaning, SOP.Rev2. The flow controllers were placed in ovens maintained at 100°C and purged with humidified nitrogen for approximately one hour.

3.4 Canister Analysis Quality Control/Quality Assurance Results

3.4.1 Laboratory Blank

Humidified nitrogen was introduced into the analytical instrument inlet line prior to analyzing the canisters to serve as a laboratory blank. Laboratory blanks are analyzed to determine the background contamination present in the analytical system. Canister data were qualified as estimated and flagged with a “B”, when the observed concentration in the sample was less than ten times the concentration in the laboratory blank. Blank values were not subtracted from the reported sample concentrations.

The laboratory blank results are presented in the Laboratory Analytical Report, provided in Appendix A. One laboratory blank was analyzed with the samples and only methyl ethyl ketone (MEK) was detected above the reporting limit 0.18 µg/m³, but it was not detected in any of the samples less than 10 times this value, except for ambient air canister sample #13483, which was qualified with a “B”.

3.4.2 Data Reproducibility/Precision Results

Canister #15046 was analyzed a second time for assessing analytical precision (Sample ID: AB65339). More specifically, a second aliquot of the same volume was withdrawn from the canister and analyzed in a similar manner. A table at the end of the Laboratory Analytical Report provided in Appendix A show the results of the laboratory duplicate. The relative percent differences (RPD) were calculated and all are less than QC limits/acceptance criterion. Therefore, the values reported are deemed acceptable and do not need to be qualified as estimated.

One duplicate canister sample pair, (canister #13500 and #14894) were collected over an 8-hour sampling period from the east side of the building. Table 2 is a comparison of compounds detected above their reporting limits in both samples along with calculated RPD. The sampling precision data were evaluated by comparing data pairs with both values greater than ten times the reporting limit and then determine if the RPD was within the 25% acceptance criteria. Based on these criteria, the acceptance criteria was satisfied for all compounds.

3.4.3 Data Accuracy Results

A laboratory fortified blank (LFB) canister sample containing selected VOCs at known

concentrations was analyzed with the canister samples to determine analytical accuracy. The results of the observed concentrations were compared to the known acceptable range and are reported in a table at the end of the Laboratory Analytical Report provided in Appendix A. All the LFB percent recovery results were within the QC limits.

3.4.4 Canister Surrogate Spike Results

Prior to analyzing each canister sample, surrogate compounds, 1,2-dichloroethane d4, bromofluorobenzene, and toluene d8 were added to the analytical system. The percent recovery data for the surrogate compounds are reported with each sample data sheet in Appendix A. The results show the recoveries for the three surrogate compounds were all determined to be acceptable.

3.4.5 Chain of Custody

Chain of custody documentation was completed by Peter Kahn. All canister samples were logged into the laboratory on January 31, 2017, transferring the sample custody to laboratory personnel. A completed chain of custody form is included with the Laboratory Analytical Report provided in Appendix A.

3.4.6 Data Validation and Usability

The analytical report provided by the EPA Regional Laboratory was further validated by Peter Kahn. The data reported by the laboratory were compared to the data quality performance criteria specified in Sections 3.4.1, 3.4.2, 3.4.3 and 3.4.4 to evaluate data usability. All data collected for this project are presented in this report and qualified as needed, no data were rejected. The data presented in this report are of acceptable quality to represent the levels of volatile organic compounds present at the indoor air, ambient air, and soil gas sampling locations. These levels may vary given differing site activities, environmental conditions and the time of year. Therefore, the data only represent the conditions prevailing at the time of sampling.

4.0 Air Grab Sampling and Analysis Methodology for VOCs

4.1 Air Grab Sampling Procedures

Air grab samples were collected by drawing 200 micro liters of air at the selected sampling locations using an air tight glass syringe. The sample was immediately analyzed on-site using the EPA mobile lab.

4.2 Air Grab Field Analytical Procedures

Air grab samples were analyzed using Region 1's standard air screening method, Air Sample Analysis for Volatile Organic Compounds, EIASOP-FLDGRAB4. Air samples were collected in a 250 micro liter steel barreled glass syringe and analyzed onsite using a Shimadzu 2010 plus gas chromatograph (GC) equipped with a 30 meter, 0.53 mm DBPS 624 column, electron capture detector (ECD) and photo ionization detector

(PID).

Concentrations of VOCs were calculated using the external standard technique. To tentatively identify compounds in a sample, professional judgment was used to compare the retention times of sample chromatogram peaks to the peak retention times of standard mixture of VOCs. When a compound was tentatively identified, quantitation was performed by a peak height comparison. The contaminants of interest and their corresponding lower reporting limits are provided below.

Compound	Reporting Limit (ppb/v)	Reporting Limit ($\mu\text{g}/\text{m}^3$)
Trichloroethylene	1.0	8.1
Tetrachloroethylene	0.8	5.4

4.3 Quality Control Procedures

The following quality control procedures were used for the on-site air grab sample analysis.

- Syringe blank injections were made after every 10 samples and as needed to assess carryover from high concentration samples. Blank values were subtracted from sample values when calculating compound concentrations.
- A one level calibration standard was analyzed repeatedly and throughout the duration of sample analyses to maintain a consistent standard chromatogram.
- Duplicate/replicate analyses were performed to determine field precision. All of the relative percent differences (RPDs) were within the $\pm 20\%$ acceptance criteria.

5.0 Soil Gas Sampling and Analysis Methodology for VOCs

5.1 Soil Gas Sampling Procedures

The installation of each sub-slab soil gas sampling probe was performed using the EPA Region I Standard Operating Procedure for Sub-Slab Soil Gas Sampling, Revision 3. Initially a hole was drilled down to a depth of 16 inches through the concrete slab and soil material below. Then a soil gas sampling probe was inserted to a depth of 4 inches where the concrete slab and soil interface. The probe was secured with clay and concrete. To collect the sample, a battery operated, portable vacuum pump, calibrated to approximately 1 liter per minute, was attached at the end of a "T" fitting to purge 1 liter from the sampling probe before collecting each sample. The pump continuously withdrew soil gas as a sample was collected. This was accomplished by inserting the needle of a glass syringe through the septa of the "T" fitting and extracting a sample from the soil gas path. Samples were then analyzed on site using the Air Grab Field Analytical Procedures described in Section 4.2.

At selected soil gas sampling locations, the sampling probe remained in the same position and a new "T" fitting, made of a stainless steel flexible line and an in-line valve, was connected for collecting a canister grab sample. The vacuum pump was attached to one end of the "T" fitting and the canister with flow controller was connected to the

other end of the "T" fitting. The canister valve remained closed as the pump purged 1 liter from the probe. Immediately after the in-line valve on the pump end of the "T" fitting was closed, the canister valve was opened to collect a grab sample. Using a flow controller on the canister calibrated to flow rate of approximately 200 ml/min. and collecting a sample for approximately 1-hour, the canister reached atmospheric pressure. All of the soil gas canister grab samples were brought back to the OEME Laboratory for analysis following the procedure described in Section 4.1.

6.0 Meteorological Measurement

6.1 Ambient Air Meteorological Data

In general, sampling during winter months is a good strategy to maximize the probability of encountering "worse case" conditions. A key factor in this regard is the movement of gases in and out of the building basement or slab on-grade, to and from the surrounding subsurface environment. Meteorological conditions and observations during and prior to the sampling event provide some insight in this regard. With respect to encountering worse-case conditions, a change in barometric pressure can promote a modest "barometric pumping" action, where higher pressure gases in the subsurface migrate to lower pressure overlying areas (including buildings). Also, moderate rainfall in the preceding days of a sampling event, moderate to high wind speeds around a building and hot forced air heating systems cycling on and off within a building during the sampling event could promote movement of subsurface vapors into a building. Meteorological data were obtained from the Manchester Airport in Manchester, NH using the following NOAA web Site, <http://cdo.ncdc.noaa.gov/qclcd>. The airport is approximately 5.7 miles northeast of the area where sampling took place.

Two tables are provided on the following pages showing the daily weather conditions for January 31 and February 1, 2017; followed by a summary table showing the average 24-hour meteorological conditions for both days. These data include: temperature, dew point, relative humidity, wind direction, wind speed, atmospheric pressure and precipitation amounts. Thirty-one hours prior to the sampling event that began on February 1 at 8:13, 0.06 inches of precipitation in the form of snow were recorded. On the day of the sampling event trace amounts of snow were recorded. As a result, the soil pore spaces potentially did not contain significant amounts of moisture prior to and during the sampling event. Therefore, soil gases potentially occupied the soil pore spaces. The average wind speed recorded during the sampling event was approximately 5 mph, ranging from 0 to 11 mph with average gusts of 4 mph, which most likely did not have the potential to promote the movement of subsurface vapors into the structure. The barometric pressure steadily increased from 29.61 inches of mercury beginning at 0:53 on 1/31/17 to 29.71 inches of mercury at 08:53 on 1/31/17, then steadily decreasing throughout the 2/01/17 the sampling period. Changes in barometric pressure over this period of time may have caused soil gases to begin moving out of the soil pore spaces and potentially into the building, if a pathway existed. There was a small amount of snow cover on the ground at the time of the sampling event.

MANCHESTER AIRPORT
MANCHESTER, NH

Date	Time (LST)	Dry Bulb Temp (F)	Wet Bulb Temp (F)	Dew Point Temp (F)	Relative Humidity (%)	Wind Speed (MPH)	Wind Direction (Degrees)	Wind Gusts (MPH)	Atmospheric Pressure (In. Hg.)	Precipitation Total (Inches)
1/31/2017	0:53	21	17	4	48	11	290		29.61	
	1:53	20	16	4	50	8	320		29.64	
	2:53	19	15	4	52	9	290		29.66	
	3:53	18	14	2	49	7	290		29.67	
	4:53	17	13	1	49	6	280		29.67	
	5:53	16	13	1	51	5	Variable		29.69	
	6:53	15	12	1	54	3	280		29.69	
	7:53	16	13	1	51	5	250		29.70	
	8:53	18	14	1	47	6	270		29.71	
	9:53	21	16	2	43	0	Calm		29.70	
	10:53	22	17	2	42	5	210		29.70	
	11:53	25	19	3	38	0	Calm		29.66	
	12:53	27	21	3	35	7	150		29.62	
	13:53	28	22	6	39	8	200		29.60	
	14:53	28	23	9	45	5	Variable		29.59	
	15:53	27	23	13	55	0	Calm		29.59	Trace
	16:53	27	Missing	14	Missing	6	150		Missing	Trace
	17:53	26	Missing	15	Missing	3	Variable		Missing	
	18:53	26	Missing	15	Missing	5	60		Missing	
	19:53	26	Missing	15	Missing	3	90		Missing	Trace
	20:53	25	Missing	18	Missing	5	140		Missing	Trace
	21:53	25	Missing	18	Missing	5	30		Missing	Trace
	22:53	24	Missing	19	Missing	5	10		Missing	Trace
	23:53	24	22	19	81	3	20		29.60	0.01
Average		23	17	8	49	5	185		29.65	
Total										0.01

MANCHESTER AIRPORT
MANCHESTER, NH

Date	Time (LST) (LST)	Dry Bulb Temp (F)	Wet Bulb Temp (F)	Dew Point Temp (F)	Relative Humidity (%)	Wind Speed (MPH)	Wind Direction (Degrees)	Wind Gusts (MPH)	Atmospheric Pressure (In. Hg.)	Precipitation Total (Inches)
2/1/2017	0:53	24	22	19	81	3	20		29.59	Trace
	1:53	24	22	19	81	5	30		29.58	0.01
	2:53	24	23	20	85	0	Calm		29.58	0.01
	3:53	24	23	21	88	0	Calm		29.58	0.02
	4:53	24	23	20	85	3	20		29.56	0.01
	5:53	24	23	20	85	0	Calm		29.56	Trace
	6:53	24	23	20	85	0	Calm		29.57	Trace
	7:53	25	23	20	81	0	Calm		29.59	Trace
	8:53	25	24	21	85	0	Calm		29.59	Trace
	9:53	27	25	22	81	3	220		29.59	
	10:53	28	26	23	82	5	210		29.58	Trace
	11:53	33	30	25	72	0	Calm		29.55	Trace
	12:53	35	32	26	70	7	190		29.53	Trace
	13:53	37	32	22	55	10	260	21	29.54	Trace
	14:53	39	33	22	51	11	250	17	29.56	
	15:53	37	32	22	55	6	240		29.58	
	16:53	37	31	21	52	8	240	18	29.61	
	17:53	36	30	20	52	6	Variable		29.62	
	18:53	35	29	19	52	3	220		29.65	
	19:53	30	Missing	20	Missing	5	190		Missing	
	20:53	34	Missing	16	Missing	5	250		Missing	
	21:53	31	Missing	16	Missing	3	340		Missing	
	22:53	30	Missing	17	Missing	5	240		Missing	
	23:53	26	Missing	17	Missing	3	130		Missing	
Average		30	27	20	73	4	191	19	29.58	
Total										0.05

Date	Temp. (F)	Dew Point (F)	Relative Humidity (%)	Wind Speed (mph)	Wind Direction	Barometric Pressure (inches Hg)
1/31/17	23	8	49	5	SSW	29.65
2/01/17	30	20	73	4	SSW	29.58

7.0 Indoor Air and Soil Gas Sampling Locations and Results

Ambient/Background Air Sample Locations

Canister #13483 was collected on February 1, 2017 from 8:13 to 16:13, 5 feet 4 inches above the ground and 17 feet 6 inches 122 feet from the northeast corner of the building, on the fence separating the 12 Wright Avenue property line the NHPC site boundary.



Sampling Results

The analytical results for the canister sampling results are shown in Table 3 which lists both target and non-target compounds detected above the reporting limits.

Building Observation

EPA observed the building from the west side of the building to be relatively no visible signs of open smoke or penetration. There were two areas on the east side of the building where the concrete slab had been cut away exposing gravel. One area on the south side adjacent to where the water line enters the building and in the northwest corner of the area where the 6 inch indoor air samples were collected. These two areas are potential vapor intrusion points of entry. The west side of the building where the truck loading dock is located is all open. The east side of the building where Agnes Power Washing has its shop, which is mostly open except for a small office located in the northeast corner and a bath room next to that.

There were numerous heavy cans of paint, cans of lubricants, and car detailing products stored in cabinets and on benches in both areas. In the truck repair shop there is a waste oil tank not all full with two tanks to supply fuel for the furnace which was not on during the sampling event. A 55-gallon drum of waste oil and a



Sampling Results

The ambient/background air canister sampling results are show on Table 3 which lists both target and non-target compounds detected above the reporting limits.

Building Observation

EPA observed the building slab on the west side of the building to be solid with no visible signs of open cracks or penetrations. There were two areas on the east side of the building where the concrete slab has been cut away exposing gravel; one area on the south end adjacent to where the water line enters the building and in the northwest corner of the area where the 8-hour indoor are samples were collected. These two areas are potential vapor intrusion points of entry. The west side of the building, where the truck repair shop is located is all open. The east side of the building is where Acme Power Washing has its shop, which is mostly open except for a small office located in the southeast corner and a bath room next to that.

There were numerous spray cans of brake cleaner, oil lubricants, and car detailing products stored in cabinets and on benches in both areas. In the truck repair shop there is a waste oil fired hot air furnace with two tanks to supply fuel for the furnace, which was not on during the sampling event. A 55-gallon drum of waste oil and a 5-

gallon open container of waste oil/diesel fuel mixture were present. Also in this area, two trucks were in various states of repair. No one was working in this area during the sampling event. There were noticeable oil and or fuel spills on the concrete floor. Two ceiling fans were present, one of which was on. The entire area had a very strong odor of oil/petroleum.

The east side of the building is heated with a natural gas fired hot air furnace, which was not on during the sampling event. A motorcycle and leaf blower with fuel in their tanks were being stored in the area for the winter. Work clothes and cleaning cloths are sent out for cleaning by UniFirst. Early on in the sampling event a clean bag of cloths and clothing were brought into the building. No one was working in this area during the sampling event. To obtain additional information about the building, an indoor air assessment survey was completed, which is provided in Appendix C.



Indoor Air Samples Locations

Canister #13500 and Canister #14894 were collected on the east side of the building where Acme Power Washing has its shop from 08:14 to 16:14 on February 1, 2017, 18 feet from the north exterior wall, 18 feet from the west interior wall, 21 feet from the east exterior wall and 18 inches above the floor. These were located next to where the concrete slab was cut away exposing gravel. Canister #14894 was a duplicate sample collocated with canister #13500.





Canister #22686 was collected on the west side of the building where the truck repair shop is located from 08:15 to 16:15 on February 1, 2017, 7 feet from the west exterior wall, 8 feet from the south exterior wall, 30 feet 8 inches from the east interior wall and 6 feet above the floor.



Soil Gas Samples Locations

SS-1 was collected from the sub-slab soil gas sampling probe inserted through the 4-inch concrete slab on the west side of the building. The probe inlet was 4 inches below the floor surface. On 2/1/17 sub-slab soil gas samples were collected below the concrete slab 21 feet 6 inches from the north exterior wall, 19 feet from the west exterior wall and 4 inches below the slab. A canister grab sample (Canister #15046) was collected as a confirmation sample and then analyzed at the EPA New England Regional laboratory (NERL).



SS-2 was collected from the sub-slab soil gas sampling probe inserted through the 4-inch concrete slab on the east side of the building. The probe inlet was 4 inches below the floor surface. On 2/1/17 a sub-slab soil gas sample was collected below the concrete slab 12 feet 7 inches from the east exterior wall, 17 feet 6 inches from the south exterior wall, and 4 inches below the slab. A canister grab sample (Canister #13501) was collected as a confirmation sample and then analyzed at the EPA New England Regional laboratory (NERL). No picture available.

Air Grab Samples for Field Screening

Grab #1 was collected from the west side of the building in the truck repair shop at the same location where the 8-hour indoor air canister sample was collected (Canister #22686). A duplicate grab sample was also collected from this location.

Grab #2 was collected from the east side of the building in the Acme Pressure Washing shop at the same location where the 8-hour indoor air canister samples were collected (Canister #13500 and #14894).

Grab #3 was collected outside the building at the same location where the 8-hour ambient air canister sample was collected (Canister #13483).

Grab #4 was collected from the east side of the building in the Acme Pressure Washing shop directly above the area where the concrete slab was cut away exposing gravel and near where the indoor air canisters #13500 and #14894 were collected.

Grab #5 was collected from the east side of the building in the Acme Pressure Washing shop directly above the area where the concrete slab was cut away on the south end adjacent to where the water line enters the building.

Grab #6 was collected from the west side of the building in the truck repair shop chemical storage cabinet located along the west wall closest to the north wall.

Grab #7 was collected from the west side of the building in the truck repair shop above the waste oil furnace supply tank.

Grab #8 was collected from the west side of the building in the truck repair shop under the cover of an old parts cleaner bath. No liquids were present nor has it been used in the shop.

Grab #9 was collected from the east side of the building in the Acme Pressure Washing shop chemical storage cabinet located along the south wall.

Shop Cleaning Cloth Bag

A syringe grab air sample was collected by inserting the syringe needle through the plastic bag to determine if cleaning cloths were off gassing PCE. The bag contained clean shop cloths that were brought into the building by UniFirst the morning of the sampling event.



Sub-slab Soil Gas Sampling Probe Assembly Blank

A sub-slab soil gas probe used at location SS#1 was blanked by drawing outside/ambient air through the probe assembly using a vacuum pump.

Brake Cleaner VOA Vile Head Space

A small amount of brake cleaner was sprayed into a VOA vile. A grab headspace air sample was collected from the vile using a syringe.



Sampling Results

The indoor air and soil gas canister sampling results are shown on Table 4 which lists both target and non-target compounds detected above the reporting limits. Table 5 shows indoor air, ambient air and soil gas canister and air grab sampling results for the compounds of concern.

TABLES

Table 1
EPA METHOD TO15 TARGET VOC LIST

EPA Region I TO-15 VOC Reported Compounds	CAS No.
1, 1, 1-Trichloroethane	71-55-6
1, 1, 2, 2-Tetrachloroethane	79-34-5
1, 1, 2-Trichloroethane	79-00-5
1, 1-Dichloroethane	75-34-3
1, 1-Dichloroethylene	75-35-4
1, 2, 4-Trichlorobenzene	120-82-1
1, 2, 4-Trimethylbenzene	95-63-6
1, 2-Dibromoethane	106-93-4
1, 2-Dichlorobenzene	95-50-1
1, 2-Dichloroethane	107-06-2
1, 2-Dichloropropane	78-87-5
1, 3, 5-Trimethylbenzene	108-67-8
1, 3-Butadiene	106-99-0
1, 3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1
1, 4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7
2-Hexanone	591-78-6
4-Ethyl Toluene	622-96-8
Acrylonitrile	107-13-1
Allyl Chloride	107-05-1
Benzene	71-43-2
Benzylchloride	100-44-7
Bromodichloromethane	75-27-4
Bromoform	75-25-2
Carbon Tetrachloride	56-23-5
Chlorobenzene	108-90-7
Chloroethane (Ethyl chloride)	75-00-3
Chloroform	67-66-3
Cyclohexane	110-82-7
Dibromochloromethane	124-48-1
Dichlorodifluoromethane (F12)	75-71-8
Dichlorotetrafluoroethane	1320-37-2
Ethylbenzene	100-41-4
Heptane	142-82-5
Hexachloro-1, 3-butadiene (Hexachlorobutadiene)	87-68-3
Hexane (n-Hexane)	110-54-3
Methyl Ethyl Ketone (2-butanone)	78-93-3
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	108-10-1
Methyl-t-butyl ether	1634-04-4
Methylbromide (Bromomethane)	74-83-9
Methylchloride (Chloromethane)	74-87-3
Methylene Chloride	75-09-2
Styrene	100-42-5
Tetrachloroethene	127-18-4
Tetrahydrofuran	109-99-9
Toluene	108-88-3
Trichloroethene	79-01-6
Trichlorofluoromethane	75-69-4
Trichlorotrifluoroethane	76-13-1
Vinyl Bromide	593-60-2
Vinyl chloride	75-01-4
cis-1, 2-Dichloroethene	156-59-2
cis-1,3-Dichloropropene	10061-01-5
m, p-Xylene (Xylene, mixture)	1330-20-7
o-Xylene	95-47-6
trans-1, 2-Dichloroethene	156-60-5
trans-1, 3-Dichloropropene	10061-02-6

TABLE 2
DUPLICATE SAMPLING RESULTS
12 WRIGHT AVENUE
MERRIMACK, NH
NH PLATING SUPERFUND SITE

COMPOUND	INDOOR AIR 12 WRIGHT AVENUE		RPD (%)
	CANISTER #13500 2/1/17 8-HOUR AVG. (µg/m ³)	DUPLICATE CANISTER #14894 2/1/17 8-HOUR AVG. (µg/m ³)	
Trichloroethene	ND (21)	ND (27)	NA
Tetrachloroethene	590	570	3
1,1,1-Trichloroethane	ND (22)	ND (28)	NA
1,1-Dichloroethene	ND (16)	ND (20)	NA
1,2-Dichloroethene	ND (16)	ND (20)	NA
1,2-Dichloroethane	ND (16)	ND (20)	NA
Vinyl Chloride	ND (10)	ND (13)	NA
Benzene	57	41	33
Cyclohexane	140	130	7
Ethylbenzene	80	81	1
4-Ethyltoluene	53	53	0
Heptane	1400	1200	15
Hexane	240	230	4
Methyl-t-Butyl Ether	25	25	0
Toluene	580	550	5
1,2,4-Trimethylbenzene	57	57	0
m/p-Xylene	250	250	0
o-Xylene	80	82	2

NOTES: ND = Not detected above reporting limits; reporting limit in parentheses

NA = not applicable, concentrations for these compounds were either less than 10 times the reporting limit or not detected above the reporting limits to calculate an RPD

Compounds in bold type are target compounds for project.

TABLE 3
 AMBIENT/BACKGROUND AIR DATA SUMMARY
 12 WRIGHT AVENUE
 MERRIMACK, NH
 NH PLATING SUPERFUND SITE

COMPOUND	AMBIENT AIR OUTSIDE CANISTER #13483 2/1/17 8-HOUR AVG. ($\mu\text{g}/\text{m}^3$)
Trichloroethene	ND (0.27)
Tetrachloroethene	ND (0.34)
1,1,1-Trichloroethane	ND (0.27)
1,1-Dichloroethene	ND (0.20)
1,2-Dichloroethene	ND (0.20)
1,2-Dichloroethane	ND (0.20)
Vinyl Chloride	ND (0.13)
Benzene	1.3
Cyclohexane	ND (0.17)
Dichlorodifluoromethane	2.2
Ethylbenzene	ND (0.22)
4-Ethyltoluene	0.55
Heptane	1.2
Hexane	0.84
Methyl-t-Butyl Ether	ND (0.18)
Methylchloride	0.96
Methyl Ethyl Ketone	0.54
Toluene	3.2
1,2,4-Trimethylbenzene	0.56
Trichlorofluoromethane	1.1
m/p-Xylene	1.0
o-Xylene	ND (0.22)

NOTES:

ND = Not detected above reporting limits; reporting limit in parentheses

B = Analyte is associated with the lab blank contamination. Values are qualified when the observed concentration of the contamination in the sample is less than 10 times the concentration in the blank.

Compounds in bold type are target compounds for project.

TABLE 4
INDOOR AIR, AMBIENT AIR AND SOIL GAS CANISTER SAMPLING RESULTS SUMMARY
12 WRIGHT AVENUE
MERRIMACK, NH
NH PLATING SUPERFUND SITE

COMPOUND	INDOOR AIR ACME PRESSURE WASHING EAST SIDE CANISTER #13500 2/1/17 8-HOUR AVG. ($\mu\text{g}/\text{m}^3$)	INDOOR AIR ACME PRESSURE WASHING EAST SIDE DUPLICATE CANISTER #14894 2/1/17 8-HOUR AVG. ($\mu\text{g}/\text{m}^3$)	INDOOR AIR TRUCK REPAIR SHOP WEST SIDE CANISTER #22686 2/1/17 8-HOUR AVG. ($\mu\text{g}/\text{m}^3$)	SUB-SLAB SOIL GAS SS#1 WEST SIDE CANISTER #15046 2/1/17 GRAB SAMPLE ($\mu\text{g}/\text{m}^3$)	SUB-SLAB SOIL GAS SS#2 EAST SIDE CANISTER #13501 2/1/17 GRAB SAMPLE ($\mu\text{g}/\text{m}^3$)	AMBIENT AIR OUTSIDE CANISTER #13483 2/1/17 8-HOUR AVG. ($\mu\text{g}/\text{m}^3$)
Trichloroethene	ND (21)	ND (27)	ND (21)	ND (30)	ND (12)	ND (0.27)
Tetrachloroethene	590	570	470	2900	500	ND (0.34)
1,1,1-Trichloroethane	ND (22)	ND (28)	ND (21)	ND (31)	610	ND (0.27)
1,1-Dichloroethane	ND (16)	ND (20)	ND (15)	ND (22)	82	ND (0.20)
1,2-Dichloroethane	ND (16)	ND (20)	ND (15)	ND (22)	ND (8.6)	ND (0.20)
1,2-Dichloroethane	ND (16)	ND (20)	ND (16)	ND (23)	ND 8.7	ND (0.20)
Vinyl Chloride	ND (10)	ND (13)	ND (9.8)	ND (14)	ND (5.5)	ND (0.13)
Benzene	57	41	49	36	ND (6.9)	1.3
Carbon Tetrachloride	ND (25)	ND (32)	ND (24)	ND (35)	96	ND (0.32)
Chloroform	ND (19)	ND (25)	ND (19)	36	4500	ND (0.24)
Cyclohexane	140	130	140	91	ND (7.4)	ND (0.17)
Dichlorodifluoromethane	ND (20)	ND (25)	ND (19)	ND (28)	ND (11)	2.2
1,1-Dichloroethane	ND (16)	ND (20)	ND (16)	ND (23)	12	ND (0.20)
Ethylbenzene	80	81	100	ND (24)	ND (9.4)	ND (0.22)
4-Ethyltoluene	53	53	69	ND (27)	ND (11)	0.55
Heptane	1400	1200	1400	490	ND (8.8)	1.2
Hexane	240	230	250	170	ND (7.6)	0.84
Methyl-t-Butyl Ether	25	25	31	ND (20)	ND (7.6)	ND (0.18)
Methylchloride	ND (8.1)	ND (10)	ND (7.9)	ND (12)	ND (4.5)	0.96
Methyl Ethyl Ketone	ND (12)	ND (15)	ND (11)	ND (17)	ND (6.4)	0.54
Toluene	580	550	640	240	ND (8.1)	3.2
1,2,4-Trimethylbenzene	57	57	79	ND (27)	ND (11)	0.56
1,3,5-Trimethylbenzene	ND (19)	ND (25)	24	ND (27)	ND (11)	ND (0.25)
Trichlorofluoromethane	ND (30)	ND (28)	ND (22)	ND (32)	ND (12)	1.1
m/p-Xylene	250	250	300	ND (49)	ND (19)	1.0
o-Xylene	80	82	100	ND (24)	ND (9.4)	ND (0.22)

NOTES:

ND = Not detected above reporting limits; reporting limit in parentheses

B = Analyte is associated with the lab blank contamination. Values are qualified when the observed concentration of the contamination in the sample is less than 10 times the concentration in the blank.

Compounds in bold type are target compounds for project.

Table 5
February 1, 2017
12 Wright Avenue
Merrimack, NH
NH Plating Superfund Site
Soil Gas Grab, Indoor Air Grab and Indoor Air 8-Hour Sampling Data

Sample Location	TCE (µg/m ³)	PCE (µg/m ³)	1,1,1-TCA (µg/m ³)	1,1-DCE (µg/m ³)	1,2-DCE (µg/m ³)	1,2-DCA (µg/m ³)	VC (µg/m ³)
Truck Repair Shop West Side							
Indoor air 8-hour canister sample (canister #22686)	ND (21)	470	ND (21)	ND (15)	ND (15)	ND (16)	ND (9.8)
Indoor air syringe grab sample #1 at canister sample (screening values)	ND (8.1)	678	NA	NA	NA	NA	NA
Indoor air syringe grab sample #1 duplicate at canister sample (screening values)	ND (8.1)	746	NA	NA	NA	NA	NA
SS-1: canister sub-slab soil gas grab sample (canister #15046)	ND (30)	2,900	ND (31)	ND (22)	ND (22)	ND (23)	ND (14)
SS-1: grab sub-slab soil gas sample (screening values only)	ND (5.4)	6,715	NA	NA	NA	NA	NA
Air grab sample #6 inside chemical storage cabinet (screening values only)	ND (8.1)	515	NA	NA	NA	NA	NA
Air grab sample #7 above waste oil tank fill point (screening values only)	ND (8.1)	468	NA	NA	NA	NA	NA
Air grab sample #8 under parts cleaner bath cover (screening values only)	ND (8.1)	814	NA	NA	NA	NA	NA
ACME Pressure Washing East Side							
Indoor air 8-hour canister sample (canister #13500)	ND (21)	590	ND (22)	ND (16)	ND (16)	ND (16)	ND (10)
Indoor air 8-hour duplicate canister sample (canister #14894)	ND (27)	570	ND (28)	ND (20)	ND (20)	ND (20)	ND (13)
Indoor air syringe grab sample #2 at canister sample (screening values)	ND (8.1)	882	NA	NA	NA	NA	NA
SS-2: canister sub-slab soil gas grab sample (canister #13501)	ND (12)	500	610	82	ND (8.6)	ND (8.7)	ND (5.5)
SS-2: grab sub-slab soil gas sample (screening values only)	ND (8.1)	543	NA	NA	NA	NA	NA
Air grab sample #4 collected directly above the area where the concrete slab was cut away exposing gravel and near where the indoor air canisters #13500 and #14894 were collected (screening values only)	ND (5.4)	746	NA	NA	NA	NA	NA
Air grab sample #5 collected directly above the area where the concrete slab was cut away on the south end adjacent to where the water line enters the building (screening values only)	ND (5.4)	624	NA	NA	NA	NA	NA
Air grab sample #9 inside chemical storage cabinet (screening values only)	ND (8.1)	468	NA	NA	NA	NA	NA
Other Air Grab Samples							
SS-1 sub-slab soil gas sample probe assembly blank (screening values only)	ND (5.4)	ND (5.4)	NA	NA	NA	NA	NA
Air grab sample from shop cleaning cloth bag (screening values)	ND (5.4)	203	NA	NA	NA	NA	NA
Air grab/headspace from VOA vile containing break cleaner fluid (screening values)	ND (215)	ND (136)	NA	NA	NA	NA	NA
Outside/Ambient Air							
Ambient air 8-hour canister sample (canister #13495)	ND (0.27)	ND (0.34)	ND (0.27)	ND (0.20)	ND (0.20)	ND (0.20)	ND (0.13)
Ambient air syringe grab sample #3 at canister sample (screening values)	ND (5.4)	ND (5.4)	NA	NA	NA	NA	NA

NOTES:

COCs = Compounds of Concern
 ND = Not detected above reporting limits; reporting limit in parentheses
 NA = Compound was not analyzed using on-site analytical methods
 TCE = Trichloroethylene, PCE = Tetrachloroethylene, 1,1-DCE = 1,1-Dichloroethene, 1,1,1-TCA = 1,1,1-Trichloroethane, 1,2-DCE = 1,2-Dichloroethene, VC = Vinyl Chloride

APPENDIX A

Laboratory Analytical Report



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

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Laboratory Report

February 21, 2017

Cheryl Sprague - Mail Code OSRR07-1

Peter Kahn - ECA / OEME

US EPA New England Region 1

Project Number: 17020004

Project: New Hampshire Plating Co - Merrimack, NH

Analysis: Air Toxics by GC/MS

EPA Chemist: Dan Curran

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-AIRCAN12.

Samples were analyzed by GC/MS using an ion trap mass spectrometer. Samples were introduced to the GC via an Entech preconcentrator using cryofocusing. Analysis SOP is based on Compendium Method TO-15, update January 1999.

Conversion of ppbv to ug/m3 = $\text{ppbv} \times (\text{mw}/24.45)$ 24.45 is based on T=25c and P = 760 mm Hg

Date Samples Received by the Laboratory: 02/02/2017

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Boudreau, Dan

DN: cn=Boudreau, Dan,

email=Boudreau.Dan@epa.gov

Date: 2017.02.21 10:16:04 -05'00'

17020004\$AIRTx

Qualifiers:

RL = Reporting limit

ND = Not Detected above Reporting limit

NA = Not Applicable due to high sample dilutions or sample interferences

NC = Not calculated since analyte concentration is ND.

J = Estimated value

J1 = Estimated value due to MS recovery outside acceptance criteria

J2 = Estimated value due to LFB result outside acceptance criteria

J3 = Estimated value due to RPD result outside acceptance criteria

J4 = Estimated value due to LCS result outside acceptance criteria

E = Estimated value exceeds the calibration range

L = Estimated value is below the calibration range

B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.

R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID:	13483	Lab Sample ID:	AB65334
Date of Collection:	2/1/2017	Matrix:	Air
Date of Preparation:	2/7/2017	Amount Prepared:	500 mL
Date of Analysis:	2/7/2017	Extract Dilution:	2.09

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
75-71-8	Dichlorodifluoromethane	0.45	2.2	0.25	
74-87-3	Methylchloride	0.46	0.96	0.10	
1320-37-2	Dichlorotetrafluoroethane	ND	ND	0.35	
75-01-4	Vinylchloride	ND	ND	0.13	
106-99-0	1,3-Butadiene	ND	ND	0.22	
74-83-9	Methylbromide	ND	ND	0.19	
75-00-3	Chloroethane	ND	ND	0.13	
75-69-4	Trichlorofluoromethane	0.20	1.1	0.28	
75-35-4	1,1-Dichloroethylene	ND	ND	0.20	
75-09-2	Methylene Chloride	ND	ND	0.17	
76-13-1	Trichlorotrifluoroethane	ND	ND	0.38	
156-60-5	t-1,2-Dichloroethylene	ND	ND	0.20	
75-34-3	1,1-Dichloroethane	ND	ND	0.20	
1634-04-4	Methyl-t-Butyl Ether	ND	ND	0.18	
78-93-3	Methyl Ethyl Ketone	0.18	0.54	0.15	B
156-59-2	c-1,2-Dichloroethylene	ND	ND	0.20	
110-54-3	Hexane	0.24	0.84	0.18	
67-66-3	Chloroform	ND	ND	0.24	
109-99-9	Tetrahydrofuran	ND	ND	0.15	
107-06-2	1,2-Dichloroethane	ND	ND	0.20	
71-55-6	1,1,1-Trichloroethane	ND	ND	0.27	
71-43-2	Benzene	0.40	1.3	0.16	
56-23-5	Carbon Tetrachloride	ND	ND	0.32	
110-82-7	Cyclohexane	ND	ND	0.17	
78-87-5	1,2-Dichloropropane	ND	ND	0.23	
75-27-4	Bromodichloromethane	ND	ND	0.34	
79-01-6	Trichloroethylene	ND	ND	0.27	
142-82-5	Heptane	0.28	1.2	0.20	
10061-01-5	c-1,3-Dichloropropylene	ND	ND	0.23	
108-10-1	Methyl Isobutyl Ketone	ND	ND	0.20	
10061-02-6	t-1,3-Dichloropropylene	ND	ND	0.23	
79-00-5	1,1,2-Trichloroethane	ND	ND	0.27	
108-88-3	Toluene	0.86	3.2	0.19	
591-78-6	2-Hexanone	ND	ND	0.20	
124-48-1	Dibromochloromethane	ND	ND	0.43	
106-93-4	1,2-Dibromoethane	ND	ND	0.38	
127-18-4	Tetrachloroethylene	ND	ND	0.34	
108-90-7	Chlorobenzene	ND	ND	0.23	
100-41-4	Ethylbenzene	ND	ND	0.22	
1330-20-7	m/p-Xylenes	0.24	1.0	0.43	
100-42-5	Styrene	ND	ND	0.21	
95-47-6	o-Xylene	ND	ND	0.22	

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 13483
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65334
Matrix: Air
Amount Prepared: 500 mL
Extract Dilution: 2.09

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	0.34	
622-96-8	4-Ethyltoluene	0.11	0.55	0.25	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	0.25	
95-63-6	1,2,4-Trimethylbenzene	0.11	0.56	0.25	
100-44-7	Benzylchloride	ND	ND	0.26	
541-73-1	1,3-Dichlorobenzene	ND	ND	0.30	
106-46-7	1,4-Dichlorobenzene	ND	ND	0.30	
95-50-1	1,2-Dichlorobenzene	ND	ND	0.30	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	0.37	
87-68-3	Hexachloro-1,3-butadiene	ND	ND	0.53	
593-60-2	Vinyl Bromide	ND	ND	0.22	
107-05-1	Allyl Chloride	ND	ND	0.16	
107-13-1	Acrylonitrile	ND	ND	0.11	
75-25-2	Bromoform	ND	ND	0.52	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane,d4	109	82 - 135
Bromofluorobenzene	94	76 - 115
Toluene,d8	103	64 - 125

Comments: Ambient

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 13500
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65335
Matrix: Air
Amount Prepared: 25 mL
Extract Dilution: 79

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
75-71-8	Dichlorodifluoromethane	ND	ND	20	
74-87-3	Methylchloride	ND	ND	8.1	
1320-37-2	Dichlorotetrafluoroethane	ND	ND	28	
75-01-4	Vinylchloride	ND	ND	10	
106-99-0	1,3-Butadiene	ND	ND	18	
74-83-9	Methylbromide	ND	ND	15	
75-00-3	Chloroethane	ND	ND	10	
75-69-4	Trichlorofluoromethane	ND	ND	22	
75-35-4	1,1-Dichloroethylene	ND	ND	16	
75-09-2	Methylene Chloride	ND	ND	14	
76-13-1	Trichlorotrifluoroethane	ND	ND	30	
156-60-5	t-1,2-Dichloroethylene	ND	ND	16	
75-34-3	1,1-Dichloroethane	ND	ND	16	
1634-04-4	Methyl-t-Butyl Ether	7.0	25	14	
78-93-3	Methyl Ethyl Ketone	ND	ND	12	
156-59-2	c-1,2-Dichloroethylene	ND	ND	16	
110-54-3	Hexane	70	240	14	
67-66-3	Chloroform	ND	ND	19	
109-99-9	Tetrahydrofuran	ND	ND	12	
107-06-2	1,2-Dichloroethane	ND	ND	16	
71-55-6	1,1,1-Trichloroethane	ND	ND	22	
71-43-2	Benzene	18	57	13	
56-23-5	Carbon Tetrachloride	ND	ND	25	
110-82-7	Cyclohexane	40	140	14	
78-87-5	1,2-Dichloropropane	ND	ND	18	
75-27-4	Bromodichloromethane	ND	ND	27	
79-01-6	Trichloroethylene	ND	ND	21	
142-82-5	Heptane	340	1400	16	
10061-01-5	c-1,3-Dichloropropylene	ND	ND	18	
108-10-1	Methyl Isobutyl Ketone	ND	ND	16	
10061-02-6	t-1,3-Dichloropropylene	ND	ND	18	
79-00-5	1,1,2-Trichloroethane	ND	ND	22	
108-88-3	Toluene	150	580	15	
591-78-6	2-Hexanone	ND	ND	16	
124-48-1	Dibromochloromethane	ND	ND	34	
106-93-4	1,2-Dibromoethane	ND	ND	30	
127-18-4	Tetrachloroethylene	88	590	27	
108-90-7	Chlorobenzene	ND	ND	18	
100-41-4	Ethylbenzene	19	80	17	
1330-20-7	m/p-Xylenes	57	250	34	
100-42-5	Styrene	ND	ND	17	
95-47-6	o-Xylene	18	80	17	

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 13500
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65335
Matrix: Air
Amount Prepared: 25 mL
Extract Dilution: 79

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	27	
622-96-8	4-Ethyltoluene	11	53	19	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	19	
95-63-6	1,2,4-Trimethylbenzene	12	57	19	
100-44-7	Benzylchloride	ND	ND	21	
541-73-1	1,3-Dichlorobenzene	ND	ND	24	
106-46-7	1,4-Dichlorobenzene	ND	ND	24	
95-50-1	1,2-Dichlorobenzene	ND	ND	24	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	29	
87-68-3	Hexachloro-1,3-butadiene	ND	ND	42	
593-60-2	Vinyl Bromide	ND	ND	17	
107-05-1	Allyl Chloride	ND	ND	12	
107-13-1	Acrylonitrile	ND	ND	8.5	
75-25-2	Bromoform	ND	ND	41	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane,d4	132	82 - 135
Bromofluorobenzene	97	76 - 115
Toluene,d8	108	64 - 125

Comments: ACME East Side

New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 14894
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65336
Matrix: Air
Amount Prepared: 25 mL
Extract Dilution: 101

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
75-71-8	Dichlorodifluoromethane	ND	ND	25	
74-87-3	Methylchloride	ND	ND	10	
1320-37-2	Dichlorotetrafluoroethane	ND	ND	35	
75-01-4	Vinylchloride	ND	ND	13	
106-99-0	1,3-Butadiene	ND	ND	22	
74-83-9	Methylbromide	ND	ND	20	
75-00-3	Chloroethane	ND	ND	13	
75-69-4	Trichlorofluoromethane	ND	ND	28	
75-35-4	1,1-Dichloroethylene	ND	ND	20	
75-09-2	Methylene Chloride	ND	ND	18	
76-13-1	Trichlorotrifluoroethane	ND	ND	39	
156-60-5	t-1,2-Dichloroethylene	ND	ND	20	
75-34-3	1,1-Dichloroethane	ND	ND	20	
1634-04-4	Methyl-t-Butyl Ether	7.1	25	18	
78-93-3	Methyl Ethyl Ketone	ND	ND	15	
156-59-2	c-1,2-Dichloroethylene	ND	ND	20	
110-54-3	Hexane	65	230	18	
67-66-3	Chloroform	ND	ND	25	
109-99-9	Tetrahydrofuran	ND	ND	15	
107-06-2	1,2-Dichloroethane	ND	ND	20	
71-55-6	1,1,1-Trichloroethane	ND	ND	28	
71-43-2	Benzene	13	41	16	
56-23-5	Carbon Tetrachloride	ND	ND	32	
110-82-7	Cyclohexane	37	130	17	
78-87-5	1,2-Dichloropropane	ND	ND	23	
75-27-4	Bromodichloromethane	ND	ND	34	
79-01-6	Trichloroethylene	ND	ND	27	
142-82-5	Heptane	290	1200	21	
10061-01-5	c-1,3-Dichloropropylene	ND	ND	23	
108-10-1	Methyl Isobutyl Ketone	ND	ND	21	
10061-02-6	t-1,3-Dichloropropylene	ND	ND	23	
79-00-5	1,1,2-Trichloroethane	ND	ND	28	
108-88-3	Toluene	150	550	19	
591-78-6	2-Hexanone	ND	ND	21	
124-48-1	Dibromochloromethane	ND	ND	43	
106-93-4	1,2-Dibromoethane	ND	ND	39	
127-18-4	Tetrachloroethylene	84	570	34	
108-90-7	Chlorobenzene	ND	ND	23	
100-41-4	Ethylbenzene	19	81	22	
1330-20-7	m/p-Xylenes	58	250	44	
100-42-5	Styrene	ND	ND	22	
95-47-6	o-Xylene	19	82	22	

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NEW ENGLAND LABORATORY

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 14894
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65336
Matrix: Air
Amount Prepared: 25 mL
Extract Dilution: 101

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	35	
622-96-8	4-Ethyltoluene	11	53	25	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	25	
95-63-6	1,2,4-Trimethylbenzene	12	57	25	
100-44-7	Benzylchloride	ND	ND	26	
541-73-1	1,3-Dichlorobenzene	ND	ND	30	
106-46-7	1,4-Dichlorobenzene	ND	ND	30	
95-50-1	1,2-Dichlorobenzene	ND	ND	30	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	38	
87-68-3	Hexachloro-1,3-butadiene	ND	ND	54	
593-60-2	Vinyl Bromide	ND	ND	22	
107-05-1	Allyl Chloride	ND	ND	16	
107-13-1	Acrylonitrile	ND	ND	11	
75-25-2	Bromoform	ND	ND	52	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane,d4	129	82 - 135
Bromofluorobenzene	102	76 - 115
Toluene,d8	104	64 - 125

Comments: ACME East Side Duplicate

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 22686
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65337
Matrix: Air
Amount Prepared: 25 mL
Extract Dilution: 76.8

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
75-71-8	Dichlorodifluoromethane	ND	ND	19	
74-87-3	Methylchloride	ND	ND	7.9	
1320-37-2	Dichlorotetrafluoroethane	ND	ND	27	
75-01-4	Vinylchloride	ND	ND	9.8	
106-99-0	1,3-Butadiene	ND	ND	17	
74-83-9	Methylbromide	ND	ND	15	
75-00-3	Chloroethane	ND	ND	10	
75-69-4	Trichlorofluoromethane	ND	ND	22	
75-35-4	1,1-Dichloroethylene	ND	ND	15	
75-09-2	Methylene Chloride	ND	ND	13	
76-13-1	Trichlorotrifluoroethane	ND	ND	29	
156-60-5	t-1,2-Dichloroethylene	ND	ND	15	
75-34-3	1,1-Dichloroethane	ND	ND	16	
1634-04-4	Methyl-t-Butyl Ether	8.9	31	14	
78-93-3	Methyl Ethyl Ketone	ND	ND	11	
156-59-2	c-1,2-Dichloroethylene	ND	ND	15	
110-54-3	Hexane	70	250	14	
67-66-3	Chloroform	ND	ND	19	
109-99-9	Tetrahydrofuran	ND	ND	11	
107-06-2	1,2-Dichloroethane	ND	ND	16	
71-55-6	1,1,1-Trichloroethane	ND	ND	21	
71-43-2	Benzene	15	49	12	
56-23-5	Carbon Tetrachloride	ND	ND	24	
110-82-7	Cyclohexane	42	140	13	
78-87-5	1,2-Dichloropropane	ND	ND	18	
75-27-4	Bromodichloromethane	ND	ND	26	
79-01-6	Trichloroethylene	ND	ND	21	
142-82-5	Heptane	330	1400	16	
10061-01-5	c-1,3-Dichloropropylene	ND	ND	17	
108-10-1	Methyl Isobutyl Ketone	ND	ND	16	
10061-02-6	t-1,3-Dichloropropylene	ND	ND	17	
79-00-5	1,1,2-Trichloroethane	ND	ND	21	
108-88-3	Toluene	170	640	14	
591-78-6	2-Hexanone	ND	ND	16	
124-48-1	Dibromochloromethane	ND	ND	33	
106-93-4	1,2-Dibromoethane	ND	ND	30	
127-18-4	Tetrachloroethylene	69	470	26	
108-90-7	Chlorobenzene	ND	ND	18	
100-41-4	Ethylbenzene	24	100	17	
1330-20-7	m/p-Xylenes	69	300	33	
100-42-5	Styrene	ND	ND	16	
95-47-6	o-Xylene	24	100	17	

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 22686
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65337
Matrix: Air
Amount Prepared: 25 mL
Extract Dilution: 76.8

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	26	
622-96-8	4-Ethyltoluene	14	69	19	
108-67-8	1,3,5-Trimethylbenzene	4.9	24	19	
95-63-6	1,2,4-Trimethylbenzene	16	79	19	
100-44-7	Benzylchloride	ND	ND	20	
541-73-1	1,3-Dichlorobenzene	ND	ND	23	
106-46-7	1,4-Dichlorobenzene	ND	ND	23	
95-50-1	1,2-Dichlorobenzene	ND	ND	23	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	29	
87-68-3	Hexachloro-1,3-butadiene	ND	ND	41	
593-60-2	Vinyl Bromide	ND	ND	17	
107-05-1	Allyl Chloride	ND	ND	12	
107-13-1	Acrylonitrile	ND	ND	8.3	
75-25-2	Bromoform	ND	ND	40	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane,d4	133	82 - 135
Bromofluorobenzene	101	76 - 115
Toluene,d8	103	64 - 125

Comments: Truck Mechanic West Side

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 13501
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65338
Matrix: Air
Amount Prepared: 50 mL
Extract Dilution: 43.2

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
75-71-8	Dichlorodifluoromethane	ND	ND	11	
74-87-3	Methylchloride	ND	ND	4.5	
1320-37-2	Dichlorotetrafluoroethane	ND	ND	15	
75-01-4	Vinylchloride	ND	ND	5.5	
106-99-0	1,3-Butadiene	ND	ND	9.6	
74-83-9	Methylbromide	ND	ND	8.4	
75-00-3	Chloroethane	ND	ND	5.7	
75-69-4	Trichlorofluoromethane	ND	ND	12	
75-35-4	1,1-Dichloroethylene	21	82	8.6	
75-09-2	Methylene Chloride	ND	ND	7.5	
76-13-1	Trichlorotrifluoroethane	ND	ND	17	
156-60-5	t-1,2-Dichloroethylene	ND	ND	8.6	
75-34-3	1,1-Dichloroethane	3.0	12	8.7	
1634-04-4	Methyl-t-Butyl Ether	ND	ND	7.6	
78-93-3	Methyl Ethyl Ketone	ND	ND	6.4	
156-59-2	c-1,2-Dichloroethylene	ND	ND	8.6	
110-54-3	Hexane	ND	ND	7.6	
67-66-3	Chloroform	920	4500	11	
109-99-9	Tetrahydrofuran	ND	ND	6.4	
107-06-2	1,2-Dichloroethane	ND	ND	8.7	
71-55-6	1,1,1-Trichloroethane	110	610	12	
71-43-2	Benzene	ND	ND	6.9	
56-23-5	Carbon Tetrachloride	15	96	14	
110-82-7	Cyclohexane	ND	ND	7.4	
78-87-5	1,2-Dichloropropane	ND	ND	10.0	
75-27-4	Bromodichloromethane	ND	ND	15	
79-01-6	Trichloroethylene	ND	ND	12	
142-82-5	Heptane	ND	ND	8.8	
10061-01-5	c-1,3-Dichloropropylene	ND	ND	9.8	
108-10-1	Methyl Isobutyl Ketone	ND	ND	8.8	
10061-02-6	t-1,3-Dichloropropylene	ND	ND	9.8	
79-00-5	1,1,2-Trichloroethane	ND	ND	12	
108-88-3	Toluene	ND	ND	8.1	
591-78-6	2-Hexanone	ND	ND	8.8	
124-48-1	Dibromochloromethane	ND	ND	18	
106-93-4	1,2-Dibromoethane	ND	ND	17	
127-18-4	Tetrachloroethylene	74	500	15	
108-90-7	Chlorobenzene	ND	ND	9.9	
100-41-4	Ethylbenzene	ND	ND	9.4	
1330-20-7	m/p-Xylenes	ND	ND	19	
100-42-5	Styrene	ND	ND	9.2	
95-47-6	o-Xylene	ND	ND	9.4	

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 13501
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65338
Matrix: Air
Amount Prepared: 50 mL
Extract Dilution: 43.2

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	15	
622-96-8	4-Ethyltoluene	ND	ND	11	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	11	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	11	
100-44-7	Benzylchloride	ND	ND	11	
541-73-1	1,3-Dichlorobenzene	ND	ND	13	
106-46-7	1,4-Dichlorobenzene	ND	ND	13	
95-50-1	1,2-Dichlorobenzene	ND	ND	13	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	16	
87-68-3	Hexachloro-1,3-butadiene	ND	ND	23	
593-60-2	Vinyl Bromide	ND	ND	9.4	
107-05-1	Allyl Chloride	ND	ND	6.7	
107-13-1	Acrylonitrile	ND	ND	4.7	
75-25-2	Bromoform	ND	ND	22	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane,d4	110	82 - 135
Bromofluorobenzene	90	76 - 115
Toluene,d8	104	64 - 125

Comments: Sub-Slab Soil Gas Grab SS-2
Chloroform result is from a 2160 fold dilution analyzed 02/07/17.

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US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 15046
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65339
Matrix: Air
Amount Prepared: 500 mL
Extract Dilution: 112

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
75-71-8	Dichlorodifluoromethane	ND	ND	28	
74-87-3	Methylchloride	ND	ND	12	
1320-37-2	Dichlorotetrafluoroethane	ND	ND	39	
75-01-4	Vinylchloride	ND	ND	14	
106-99-0	1,3-Butadiene	ND	ND	25	
74-83-9	Methylbromide	ND	ND	22	
75-00-3	Chloroethane	ND	ND	15	
75-69-4	Trichlorofluoromethane	ND	ND	32	
75-35-4	1,1-Dichloroethylene	ND	ND	22	
75-09-2	Methylene Chloride	ND	ND	20	
76-13-1	Trichlorotrifluoroethane	ND	ND	43	
156-60-5	t-1,2-Dichloroethylene	ND	ND	22	
75-34-3	1,1-Dichloroethane	ND	ND	23	
1634-04-4	Methyl-t-Butyl Ether	ND	ND	20	
78-93-3	Methyl Ethyl Ketone	ND	ND	17	
156-59-2	c-1,2-Dichloroethylene	ND	ND	22	
110-54-3	Hexane	50	170	20	
67-66-3	Chloroform	7.3	36	27	
109-99-9	Tetrahydrofuran	ND	ND	17	
107-06-2	1,2-Dichloroethane	ND	ND	23	
71-55-6	1,1,1-Trichloroethane	ND	ND	31	
71-43-2	Benzene	11	36	18	
56-23-5	Carbon Tetrachloride	ND	ND	35	
110-82-7	Cyclohexane	26	91	19	
78-87-5	1,2-Dichloropropane	ND	ND	26	
75-27-4	Bromodichloromethane	ND	ND	38	
79-01-6	Trichloroethylene	ND	ND	30	
142-82-5	Heptane	120	490	23	
10061-01-5	c-1,3-Dichloropropylene	ND	ND	25	
108-10-1	Methyl Isobutyl Ketone	ND	ND	23	
10061-02-6	t-1,3-Dichloropropylene	ND	ND	25	
79-00-5	1,1,2-Trichloroethane	ND	ND	31	
108-88-3	Toluene	63	240	21	
591-78-6	2-Hexanone	ND	ND	23	
124-48-1	Dibromochloromethane	ND	ND	48	
106-93-4	1,2-Dibromoethane	ND	ND	43	
127-18-4	Tetrachloroethylene	420	2900	38	
108-90-7	Chlorobenzene	ND	ND	26	
100-41-4	Ethylbenzene	ND	ND	24	
1330-20-7	m/p-Xylenes	ND	ND	49	
100-42-5	Styrene	ND	ND	24	
95-47-6	o-Xylene	ND	ND	24	

17020004\$AIRTx

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

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New Hampshire Plating Co - Merrimack, NH

Air Toxics by GC/MS

Client Sample ID: 15046
Date of Collection: 2/1/2017
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: AB65339
Matrix: Air
Amount Prepared: 500 mL
Extract Dilution: 112

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	38	
622-96-8	4-Ethyltoluene	ND	ND	27	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	27	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	27	
100-44-7	Benzylchloride	ND	ND	29	
541-73-1	1,3-Dichlorobenzene	ND	ND	34	
106-46-7	1,4-Dichlorobenzene	ND	ND	34	
95-50-1	1,2-Dichlorobenzene	ND	ND	34	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	42	
87-68-3	Hexachloro-1,3-butadiene	ND	ND	60	
593-60-2	Vinyl Bromide	ND	ND	24	
107-05-1	Allyl Chloride	ND	ND	17	
107-13-1	Acrylonitrile	ND	ND	12	
75-25-2	Bromoform	ND	ND	58	

Surrogate Compounds

Recoveries (%)

QC Ranges

1,2-Dichloroethane,d4
Bromofluorobenzene
Toluene,d8

118
95
99

82 - 135
76 - 115
64 - 125

Comments: Sub-Slab Soil Gas Grab SS-1

17020004\$AIRTx

New Hampshire Plating Co - Merrimack, NH

Laboratory Blank

Client Sample ID: N/A

Date of Collection: N/A

Date of Preparation: 2/7/2017

Date of Analysis: 2/7/2017

Lab Sample ID: N/A

Matrix: Air

Amount Prepared: 500 mL

Extract Dilution: 1

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
75-71-8	Dichlorodifluoromethane	ND	ND	0.25	
74-87-3	Methylchloride	ND	ND	0.10	
1320-37-2	Dichlorotetrafluoroethane	ND	ND	0.35	
75-01-4	Vinylchloride	ND	ND	0.13	
106-99-0	1,3-Butadiene	ND	ND	0.22	
74-83-9	Methylbromide	ND	ND	0.19	
75-00-3	Chloroethane	ND	ND	0.13	
75-69-4	Trichlorofluoromethane	ND	ND	0.28	
75-35-4	1,1-Dichloroethylene	ND	ND	0.20	
75-09-2	Methylene Chloride	ND	ND	0.17	
76-13-1	Trichlorotrifluoroethane	ND	ND	0.38	
156-60-5	t-1,2-Dichloroethylene	ND	ND	0.20	
75-34-3	1,1-Dichloroethane	ND	ND	0.20	
1634-04-4	Methyl-t-Butyl Ether	ND	ND	0.18	
78-93-3	Methyl Ethyl Ketone	0.062	0.18	0.15	
156-59-2	c-1,2-Dichloroethylene	ND	ND	0.20	
110-54-3	Hexane	ND	ND	0.18	
67-66-3	Chloroform	ND	ND	0.24	
109-99-9	Tetrahydrofuran	ND	ND	0.15	
107-06-2	1,2-Dichloroethane	ND	ND	0.20	
71-55-6	1,1,1-Trichloroethane	ND	ND	0.27	
71-43-2	Benzene	ND	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	ND	0.32	
110-82-7	Cyclohexane	ND	ND	0.17	
78-87-5	1,2-Dichloropropane	ND	ND	0.23	
75-27-4	Bromodichloromethane	ND	ND	0.34	
79-01-6	Trichloroethylene	ND	ND	0.27	
142-82-5	Heptane	ND	ND	0.20	
10061-01-5	c-1,3-Dichloropropylene	ND	ND	0.23	
108-10-1	Methyl Isobutyl Ketone	ND	ND	0.20	
10061-02-6	t-1,3-Dichloropropylene	ND	ND	0.23	
79-00-5	1,1,2-Trichloroethane	ND	ND	0.27	
108-88-3	Toluene	ND	ND	0.19	
591-78-6	2-Hexanone	ND	ND	0.20	
124-48-1	Dibromochloromethane	ND	ND	0.43	
106-93-4	1,2-Dibromoethane	ND	ND	0.38	
127-18-4	Tetrachloroethylene	ND	ND	0.34	
108-90-7	Chlorobenzene	ND	ND	0.23	
100-41-4	Ethylbenzene	ND	ND	0.22	
1330-20-7	m/p-Xylenes	ND	ND	0.43	
100-42-5	Styrene	ND	ND	0.21	
95-47-6	o-Xylene	ND	ND	0.22	

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

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New Hampshire Plating Co - Merrimack, NH

Laboratory Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Preparation: 2/7/2017
Date of Analysis: 2/7/2017

Lab Sample ID: N/A
Matrix: Air
Amount Prepared: 500 mL
Extract Dilution: 1

CAS Number	Compound	Concentration ppbv	Concentration ug/m3	RL ug/m3	Qualifier
79-34-5	1,1,2,2-Tetrachloroethane	ND	ND	0.34	
622-96-8	4-Ethyltoluene	ND	ND	0.25	
108-67-8	1,3,5-Trimethylbenzene	ND	ND	0.25	
95-63-6	1,2,4-Trimethylbenzene	ND	ND	0.25	
100-44-7	Benzylchloride	ND	ND	0.26	
541-73-1	1,3-Dichlorobenzene	ND	ND	0.30	
106-46-7	1,4-Dichlorobenzene	ND	ND	0.30	
95-50-1	1,2-Dichlorobenzene	ND	ND	0.30	
120-82-1	1,2,4-Trichlorobenzene	ND	ND	0.37	
87-68-3	Hexachloro-1,3-butadiene	ND	ND	0.53	
593-60-2	Vinyl Bromide	ND	ND	0.22	
107-05-1	Allyl Chloride	ND	ND	0.16	
107-13-1	Acrylonitrile	ND	ND	0.11	
75-25-2	Bromoform	ND	ND	0.52	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane,d4	115	82 - 135
Bromofluorobenzene	96	76 - 115
Toluene,d8	110	64 - 125

Comments:

New Hampshire Plating Co - Merrimack, NH

Laboratory Duplicate Results

Sample ID: AB65339

PARAMETER	SAMPLE RESULT ppbv	SAMPLE DUPLICATE RESULT ppbv	PRECISION RPD %	QC LIMITS
1,1,1-Trichloroethane	ND	ND	ND	50
1,1,2,2-Tetrachloroethane	ND	ND	ND	50
1,1,2-Trichloroethane	ND	ND	ND	50
1,1-Dichloroethane	ND	ND	ND	50
1,1-Dichloroethylene	ND	ND	ND	50
1,2,4-Trichlorobenzene	ND	ND	ND	50
1,2,4-Trimethylbenzene	ND	ND	ND	50
1,2-Dibromoethane	ND	ND	ND	50
1,2-Dichlorobenzene	ND	ND	ND	50
1,2-Dichloroethane	ND	ND	ND	50
1,2-Dichloropropane	ND	ND	ND	50
1,3,5-Trimethylbenzene	ND	ND	ND	50
1,3-Butadiene	ND	ND	ND	50
1,3-Dichlorobenzene	ND	ND	ND	50
1,4-Dichlorobenzene	ND	ND	ND	50
2-Hexanone	ND	ND	ND	50
4-Ethyltoluene	ND	ND	ND	50
Acrylonitrile	ND	ND	ND	50
Allyl Chloride	ND	ND	ND	50
Benzene	11.400	11.600	1.74	50
Benzylchloride	ND	ND	ND	50
Bromodichloromethane	ND	ND	ND	50
Bromoform	ND	ND	ND	50
Carbon Tetrachloride	ND	ND	ND	50
Chlorobenzene	ND	ND	ND	50
Chloroethane	ND	ND	ND	50
Chloroform	7.280	6.750	7.56	50
Cyclohexane	26.400	25.600	3.08	50
Dibromochloromethane	ND	ND	ND	50
Dichlorodifluoromethane	ND	ND	ND	50
Dichlorotetrafluoroethane	ND	ND	ND	50
Ethylbenzene	ND	ND	ND	50
Heptane	121.000	126.000	4.05	50
Hexachloro-1,3-butadiene	ND	ND	ND	50
Hexane	49.600	47.900	3.49	50
Methyl Ethyl Ketone	ND	ND	ND	50
Methyl Isobutyl Ketone	ND	ND	ND	50
Methyl-t-Butyl Ether	ND	ND	ND	50
Methylbromide	ND	ND	ND	50
Methylchloride	ND	ND	ND	50
Methylene Chloride	ND	ND	ND	50
Styrene	ND	ND	ND	50
Tetrachloroethylene	421.000	396.000	6.12	50
Tetrahydrofuran	ND	ND	ND	50
Toluene	63.200	63.400	0.316	50

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

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New Hampshire Plating Co - Merrimack, NH

Laboratory Duplicate Results

Sample ID: AB65339

PARAMETER	SAMPLE RESULT ppbv	SAMPLE DUPLICATE RESULT ppbv	PRECISION RPD %	QC LIMITS
Trichloroethylene	ND	ND	ND	50
Trichlorofluoromethane	ND	ND	ND	50
Trichlorotrifluoroethane	ND	ND	ND	50
Vinyl Bromide	ND	ND	ND	50
Vinylchloride	ND	ND	ND	50
c-1,2-Dichloroethylene	ND	ND	ND	50
c-1,3-Dichloropropylene	ND	ND	ND	50
m/p-Xylenes	ND	ND	ND	50
o-Xylene	ND	ND	ND	50
t-1,2-Dichloroethylene	ND	ND	ND	50
t-1,3-Dichloropropylene	ND	ND	ND	50

Comments:

US ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND LABORATORY

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New Hampshire Plating Co - Merrimack, NH

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb/V	LFB RESULT ppb/V	LFB RECOVERY %	QC LIMITS %
1,1,1-Trichloroethane	1.9	2.23	117	70 - 130
1,1,2,2-Tetrachloroethane	1.9	1.86	98	70 - 130
1,1,2-Trichloroethane	1.9	2.03	107	70 - 130
1,1-Dichloroethane	1.9	2.41	127	70 - 130
1,1-Dichloroethylene	1.9	2.40	126	70 - 130
1,2,4-Trichlorobenzene	1.9	1.83	96	70 - 130
1,2,4-Trimethylbenzene	1.9	1.82	96	70 - 130
1,2-Dibromoethane	1.9	2.14	113	70 - 130
1,2-Dichlorobenzene	1.9	1.88	99	70 - 130
1,2-Dichloroethane	1.9	2.16	114	70 - 130
1,2-Dichloropropane	1.9	2.01	106	70 - 130
1,3,5-Trimethylbenzene	1.9	1.94	102	70 - 130
1,3-Butadiene	3.8	4.56	120	70 - 130
1,3-Dichlorobenzene	1.9	1.93	102	70 - 130
1,4-Dichlorobenzene	1.9	1.86	98	70 - 130
2-Hexanone	1.9	1.82	96	70 - 130
4-Ethyltoluene	1.9	1.70	90	70 - 130
Acrylonitrile	1.9	2.46	129	70 - 130
Allyl Chloride	1.9	1.97	104	70 - 130
Benzene	1.9	2.00	105	70 - 130
Benzylchloride	1.9	1.70	90	70 - 130
Bromodichloromethane	1.9	1.88	99	70 - 130
Bromoform	1.9	1.32	70	70 - 130
Carbon Tetrachloride	1.9	2.16	114	70 - 130
Chlorobenzene	1.9	1.86	98	70 - 130
Chloroethane	1.9	2.21	116	70 - 130
Chloroform	1.9	2.21	116	70 - 130
Cyclohexane	1.9	2.01	106	70 - 130
Dibromochloromethane	1.9	1.74	92	70 - 130
Dichlorodifluoromethane	1.9	2.22	117	70 - 130
Dichlorotetrafluoroethane	1.9	2.22	117	70 - 130
Ethylbenzene	1.9	1.87	98	70 - 130
Heptane	1.9	1.82	96	70 - 130
Hexachloro-1,3-butadiene	1.9	1.97	104	70 - 130
Hexane	1.9	2.10	111	70 - 130
Methyl Ethyl Ketone	1.9	2.06	108	70 - 130
Methyl Isobutyl Ketone	1.9	1.86	98	70 - 130
Methyl-t-Butyl Ether	1.9	1.97	104	70 - 130
Methylbromide	1.9	2.12	112	70 - 130
Methylchloride	1.9	2.24	118	70 - 130
Methylene Chloride	1.9	2.42	127	70 - 130
Styrene	1.9	1.96	103	70 - 130
Tetrachloroethylene	1.9	2.03	107	70 - 130
Tetrahydrofuran	1.9	1.97	104	70 - 130
Toluene	1.9	1.95	103	70 - 130
Trichloroethylene	1.9	1.85	97	70 - 130
Trichlorofluoromethane	1.9	2.24	118	70 - 130
Trichlorotrifluoroethane	1.9	2.34	123	70 - 130
Vinyl Bromide	1.9	2.02	106	70 - 130
Vinylchloride	1.9	2.28	120	70 - 130
c-1,2-Dichloroethylene	1.9	2.23	117	70 - 130
c-1,3-Dichloropropylene	1.9	2.04	107	70 - 130

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US ENVIRONMENTAL PROTECTION AGENCY
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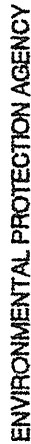
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New Hampshire Plating Co - Merrimack, NH

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ppb/V	LFB RESULT ppb/V	LFB RECOVERY %	QC LIMITS %
m/p-Xylenes	3.8	3.68	97	70 - 130
o-Xylene	1.9	1.84	97	70 - 130
t-1,2-Dichloroethylene	1.9	2.04	107	70 - 130
t-1,3-Dichloropropylene	1.9	2.00	105	70 - 130

Comments:



REGION 1

CHAIN OF CUSTODY RECORD

[illegible]

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

APPENDIX B

Mobile Laboratory Analytical Report



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Page 1 of 4

Laboratory Report

February 08, 2017

Cheryl Sprague - Mail Code OSRR07-1

Peter Kahn - ECA / OEME

US EPA New England Region 1

Project Number: 17020002

Project: New Hampshire Plating Co - Merrimack, NH

Analysis: Volatile Organic Analysis of Air

Analyst: Scott Clifford

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-FLDGRAB4.

Air samples were analyzed using Region I's standard air screening method. Air samples were collected in a steel barrel glass syringe and were analyzed using a Shimadzu gas chromatograph equipped with a 30 meter, 0.53 mm i.d DBPS-624 column with electron capture and photoionization detectors.

Concentrations of volatile organics were calculated using the external standard technique. Results are reported in parts per billion by volume.

Analytes reported by this field method should be treated as tentatively identified compounds and concentrations are approximate.

Date Samples Received by the Laboratory: 2/2/17

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

Digitally signed by Boudreau, Dan

DN: cn=Boudreau, Dan,

email=Boudreau.Dan@epa.gov

Date: 2017.02.08 13:56:27 -05'00'

17020002\$FVOAA

Qualifiers:

RL = Reporting limit

ND = Not Detected above Reporting limit

NA = Not Applicable due to high sample dilutions or sample interferences

NC = Not calculated since analyte concentration is ND.

J = Estimated value

J1 = Estimated value due to MS recovery outside acceptance criteria

J2 = Estimated value due to LFB result outside acceptance criteria

J3 = Estimated value due to RPD result outside acceptance criteria

J4 = Estimated value due to LCS result outside acceptance criteria

E = Estimated value exceeds the calibration range

L = Estimated value is below the calibration range

B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.

R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

US ENVIRONMENTAL PROTECTION AGENCY
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New Hampshire Plating Co - Merrimack, NH

Volatile Organic Analysis of Air

Lab Sample ID	Client Sample ID	Tetrachloroethylene ppbv	Trichloroethylene ppbv
AB65318	Grab 1	100	ND (1.5)
AB65319	Grab 1 Dup	110	ND (1.5)
AB65320	Grab 2	130	ND (1.5)
AB65321	Grab 3	ND (0.8)	ND (1.0)
AB65322	SS-1	990	ND (1.0)
AB65323	SS probe Blank	ND (0.8)	ND (1.0)
AB65324	Rag Bag	30	ND (1.0)
AB65325	SS-2	80	ND (1.5)
AB65326	Grab 4	110	ND (1.0)
AB65327	Grab 5	92	ND (1.0)
AB65328	Brake Cleaner HS	ND (20)	ND (40)
AB65329	Grab 6	76	ND (1.5)
AB65330	Grab 7	69	ND (1.5)
AB65331	Grab 8	120	ND (1.5)
AB65332	Grab 9	69	ND (1.5)

2/11/17

PN 17020002

NH Plating
Merrimack, NH
Air VOA's

For Log in Please

FV0AA

Thank you

- 5 coll.

Shimadzu GC 2010 Plus

30 m, 0.53 mm DBPS 624 column

ECD - Also PID used but very poor sensitivity

Samples collected in syringe.

Results
ppb/v

Sample #		TCE	C2Cl4	Other
(1)	Grab 1 (Mechanics Room)	ND(1.5)	102	large unid peak on PID
(2)	Grab 1 Dup	ND(1.5)	113	large unid peak on PID
(3)	Grab 2 (Car washing side)	ND(1.5)	130	large unid peak on PID
(4)	Grab 3 (outside ambient)	ND(1.0)	ND(0.8)	small unid peak PID
(5)	SS-1 (Mechanics Room)	ND(1.0)	988	small unid peak peak
(6)	SS probe Blank	ND(1.0)	ND(0.8)	small unid peak
(7)	Reg Bag	ND(1.0)	30	small unid peak
(8)	SS-2	ND(1.5)	80	unid peaks
(9)	Grab 4 (gravel area)	ND(1.0)	111	unid peaks
(10)	Grab 5 (gravel near water line)	ND(1.0)	92	unid peaks
(11)	Break Cleaner HS	ND(1.0)	ND(20)	unid peaks
(12)	Grab 6 (cabinet hole)	ND(1.5)	76	unid peaks
(13)	Grab 7 (oil tank)	ND(1.5)	69	unid peak
(14)	Grab 8 (Bath)	ND(1.5)	118	unid peaks
(15)	Grab 9 (Acme Cabinet)	ND(1.5)	69	unid peaks

APPENDIX C

Indoor Air Assessment Survey

Indoor Air Assessment Survey
SURVEY OF OCCUPIED DWELLING

Date: 2/11/17

(1) Name: Acme Pressure Washing NH Plating Superfund Site

Address:

12 Wright Ave.
Merrimack, NH

(2) Type of Structure: Condominium, Townhouse, Single Family Home, Other Commercial

(3) Size of Structure: 1 floors 0 basement

(4) Age of Structure: Unknown years

(5) Construction of Structure: Wood, brick, concrete, cinder block other

(6) Number of Occupants: _____ Person (s) Duration of residency: NA West Side: 1 mechanic
East Side: 2-3 employees
not all day

(7) Foundation: Concrete slab footings on earth, other
~4" thick

(8) Unit Description: Inside building has 2 areas (truck mechanic West Side, Acme East Side)

Room	Furnishings (tables, chairs, etc.) none, light, moderate, heavy	Wall covering: none, paint (oil/water-based), wallpaper, paneling,	Month/year last painted or wallpapered
<u>both sides</u>	<u>none (except desk & chairs)</u>	<u>paint water-based</u>	<u>unknown</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Comments

SURVEY OF OCCUPIED DWELLING

- (9) Heating: Fuel type: electric, gas, oil, wood, coal, fireplace, other hot forced air
Conveyance system: hot water, forced-air, other waste oil + natural gas
Heating systems not on during survey
- (10) Air Conditioning: Central air conditioning, window air conditioning unit (s),
other none
- (11) Ventilation: Fans: room, ceiling, attic ventilate using the fan only mode of your central air conditioning
or forced air heating system? (~~Yes~~/No) 2 ceiling fans in truck repair shop
1 was on during survey
Summer conditions: open window (never, rarely, usually)
doors open in summer
- (12) Termite/Pesticide Treatment: None, yes, unknown
Type of pest controlled: unknown
- (13) Water Heater: Type: gas, electric, other small water heater in bathroom
Location: basement, kitchen, garage, other bathroom
- (14) Cooking Applications: Electric, gas, exhaust hood present, other none
- (15) Use of Consumer Products: Hardly Ever (less than once/month), Occasionally (about once/month),
Regularly (about once/week), Often (more than once/week)

<u>Product</u>	<u>Frequency of Use</u>
Spray-on deodorant	Hardly ever, Occasionally, Regularly, Often
Aerosol deodorizers	Hardly ever, Occasionally, Regularly, Often
Insecticides	Hardly ever, Occasionally, Regularly, Often
Disinfectants	Hardly ever, Occasionally, Regularly, Often
Window cleaners	Hardly ever, Occasionally, Regularly, Often
Spray-on oven cleaners	Hardly ever, Occasionally, Regularly, Often
Nail polish remover	Hardly ever, Occasionally, Regularly, Often
Hair sprays	Hardly ever, Occasionally, Regularly, Often

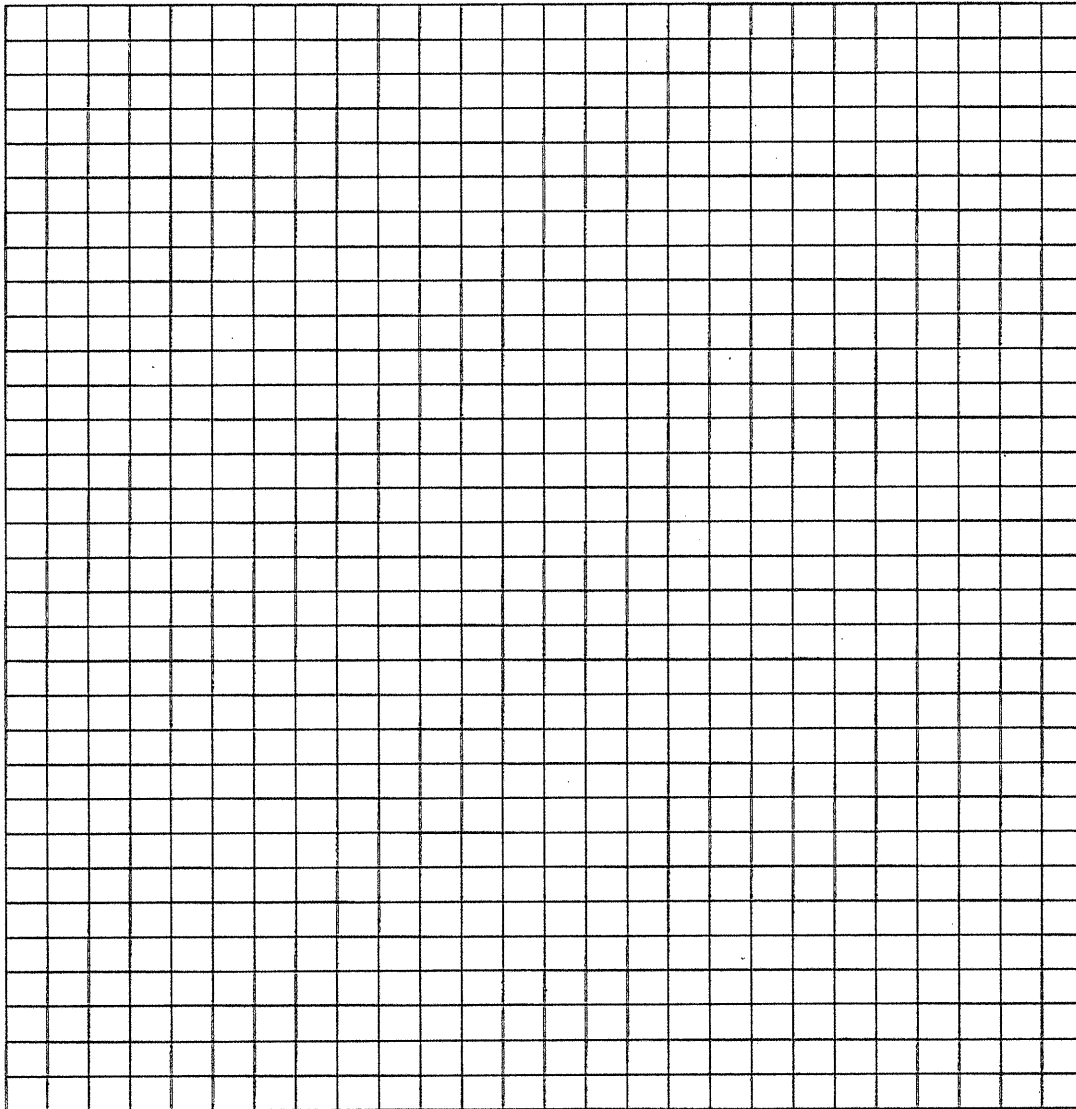
See next page for list of products used and stored
within building

SURVEY OF OCCUPIED DWELLING

- (16) Routine Household Cleaning Practices: Dusting, dry sweeping, vacuuming, polishing, refinishing, other Did not appear to be any cleaning being done other than sweeping
- (17) Smoking in Home: None, rare (only guests), moderate (residents light smokers), heavy (more than one heavy smoker in household) yes, mechanic smoker when working (no one was working in building during survey)
- (18) Indoor home Hobbies or Crafts Involving: None, heating, soldering, welding, model glues, paint, spray paint, other truck repair shop
- (19) Stored Chemicals (Indoors): None, paint, paint thinner, solvents, gasoline, diesel, household cleaning compounds, cosmetics, other see below
- (20) Other comments Inventory West Side: 55 gallon drum waste oil; 55 gallon pail of diesel/
gasoline mixture fuel; brake cleaner 14oz spray cans (contains acetone, xylene, toluene, heptane;
Liquid wrench; chain/cable lube spray cans; mineral spirits; PB blaster 11oz spray cans;
Wish 15oz spray can (solvent naphtha petroleum, xylene, VOC 98.6%)
- Inventory East Side: PB blaster; liquid wrench; white Lithium grease; CRC battery
terminal protector 7.5oz spray cans (hexane hydrocarbons heptane, xylene,
ethylbenzene; car detailing products; Goo Off (Graffiti Remover) 18oz spray
cans (acetone, n-methyl-2 pyrididone)
- motorcycle and leaf blower with gas stored inside

SURVEY OF OCCUPIED DWELLING
Floor Plan Sketch

Address



APPENDIX D

Compound Product Use Description

COMPOUND	PRODUCT USE
1, 1,1-trichloroethane	no 1,1,1-trichloroethane is supposed to be manufactured for domestic use in the US after January 1, 2002; it had many industrial and household uses, including use as a solvent to dissolve other substances, such as glues and paints, to remove oil or grease from manufactured metal parts and as an ingredient of household products such as spot cleaners, glues, and aerosol sprays
1,1,2,2-tetrachloroethane	in the past was used in large amounts to produce other chemicals, as an industrial solvent to clean and degrease metals and as an ingredient in paints and pesticides; commercial production for these uses has stopped in the US, presently used only as a chemical intermediate in the production of other chemicals
1,1,2-trichloroethane	used as a solvent and as an intermediate in the production of the chemical 1,1-dichloroethane; is sometimes present as an impurity in other chemicals and it may be formed when another chemical breaks down in the environment under conditions where there is no air
1,1-dichloroethane	in the past was used as a surgical anesthetic, but it is no longer used this way; today it is used primarily to make other chemicals, to dissolve substances such as paint, varnish, and finish removers, and to remove grease
1,1-dichloroethylene	used to make certain plastics, such as flexible films like food wrap and in packaging materials; used to make flame retardant coatings for fiber and carpet backings and in piping, coating for steel pipes and in adhesive applications
1,2,4-trichlorobenzene	used as a solvent to make dyes, pesticides and other chemicals, added to dielectric fluids, transformer oils, cleaners, and lubricants; a gasoline additive; occurs naturally in coal tar and petroleum
1, 2, 4-trimethylbenzene	used as an industrial solvent, paint thinner and in the manufacture of dyes, perfumes, resins, chemical intermediates and pharmaceuticals; enters the environment primarily from gasoline evaporation and as an emission from gasoline-powered vehicles, municipal waste-treatment plants, and coal-fired power stations; emitted from many building materials including: vinyl & rubber molding, particle board, linoleum tile, tar paper, telephone cable, latex paint, foam & duct insulation, urethane sealant, adhesives, latex caulk, and carpet occurs
1,2-dibromoethane	manufactured chemical and also occurs naturally in small amounts in the ocean where it is formed, probably by algae and kelp; used as a pesticide in soil and on citrus, vegetable and grain crops, most of these uses have been stopped by the EPA since 1984; was used as an additive in leaded gasoline, however since leaded gasoline is now banned, it is no longer used for this purpose; uses today include treatment of logs for termites and beetles, control of moths in beehives, as a solvent, as a preparation for dyes and waxes and in waterproofing preparations
1,2-dichlorobenzene	used as a fumigant, solvent, chemical intermediate and to make insecticides
1,2-dichloroethane	manufactured chemical that is not found naturally in the environment; most common use is in the production of vinyl chloride which is used to make a variety of plastic and vinyl products including PVC pipes, furniture and automobile upholstery, wall coverings, house wares and automobile parts; used as a solvent, fumigant, degreaser, paint thinner; added to leaded gasoline to remove lead

COMPOUND	PRODUCT USE
1,2-dichloropropane	does not occur naturally in the environment; production in the US has declined over the past 20 years; was used in the past as a soil fumigant, chemical intermediate and industrial solvent and was found in paint strippers, varnishes and furniture finish removers; most of these uses were discontinued; today used as a chemical intermediate to make perchloroethylene and several other related chlorinated chemical
1, 3, 5-trimethylbenzene	used as an industrial solvent, paint thinner and in the manufacture of dyes, perfumes, resins, chemical intermediates and pharmaceuticals; enters the environment primarily from gasoline evaporation and as an emission from gasoline-powered vehicles, municipal waste-treatment plants, and coal-fired power stations; emitted from many building materials including: vinyl & rubber molding, particle board, linoleum tile, tar paper, telephone cable, latex paint, foam & duct insulation, urethane sealant, adhesives, latex caulk and carpet
1, 3-butadiene	made from the processing of petroleum; about 75% manufactured is used to make synthetic rubber, which is widely used for tires on cars and trucks; used to make plastics including acrylics; small amounts are found in gasoline, automobile exhaust, cigarette smoke and wood fires
1,3-dichlorobenzene	used to make herbicides, insecticides, medicine and dyes
1,4-dichlorobenzene	used as a fumigant to control mildew and mold; used to make insecticides
2-hexanone	used in the past in paint and paint thinner, to make other chemical substances and to dissolve oils and waxes; no longer made or used in the US because it has harmful health effects; formed as a waste product resulting from industrial activities such as making wood pulp and producing gas from coal and in oil shale operations
4-ethyltoluene	man-made chemical used principally as an additive to petroleum; used as a solvent in a variety of industrial, agricultural and domestic products; major release route to the atmosphere is from evaporation of petroleum during production, transport and refueling and from car exhausts; released when used as a solvent
acrylonitrile	used to make other chemicals such as plastics, synthetic rubber and acrylic fibers; a mixture of acrylonitrile and carbon tetrachloride was used as a pesticide in the past; all uses in pesticide have stopped
ally chloride	used to make epichlorohydrin and glycerin; used in the synthesis of allyl compounds such as allyl alcohol, allyl amines, allyl esters and polyesters; derivatives are found in varnish, plastics, adhesives, perfumes, insecticides and pharmaceuticals
Benzene	widely used in the US; some industries use it to make other chemicals which are used to make plastics, resins, nylon and synthetic fibers; used to make some types of rubbers, lubricants, dyes, detergents, drugs and pesticides; natural sources include volcanoes and forest fires; a natural part of crude oil and gasoline; found in industrial emissions, waste and storage operations, motor vehicle exhaust, evaporation from gasoline service stations and tobacco smoke
benzylchloride	used as a chemical intermediate in the manufacture of certain dyes, lubricants, gasoline and pharmaceutical products and as a photographic developer; emissions from floor tile plasticized by butyl benzyl phthalate have been reported; has been detected in emissions from the burning of polyvinyl chloride, neoprene and rigid urethane foam compounds

COMPOUND	PRODUCT USE
bromodichloromethane	small amounts are formed naturally by algae in the oceans; only small quantities are produced in the US; small quantities that are produced are used in laboratories or to make other chemicals; most is formed as a by-product when chlorine is added to drinking water to kill bacteria
bromoform	small amounts are formed naturally by plants in the ocean; formed as byproducts when chlorine is added to drinking water to kill bacteria; were used in the past as solvents and flame retardants, or to make other chemicals; small quantities are produced in the US and used mainly as laboratory reagents
carbon tetrachloride	manufactured chemical that does not occur naturally; was used in the production of refrigeration fluid and propellants for aerosol cans, as a pesticide, as a cleaning fluid and degreasing agent, in fire extinguishers and in spot removers; these uses are now banned and it is only used in some industrial applications
chlorobenzene	does not occur naturally in the environment; production in the US has declined by more than 60% from its peak in 1960; was used in the past to make other chemicals, such as phenol and DDT; now chlorobenzene is used as a solvent for some pesticide formulations, to degrease automobile parts, and as a chemical intermediate to make several other chemicals
chloroethane	In the past was used in leaded gasoline; used in the production of cellulose, dyes, medicinal drugs, and other commercial products and as a solvent and refrigerant; used to numb the skin before medical procedures such as ear piercing and skin biopsies and as a treatment in sports injuries
Chloroform	used to make other chemicals and can also be formed in small amounts when chlorine is added to water
cyclohexane	occurs naturally in petroleum crude oil, in volcanic gases, and in cigarette smoke; used to make nylon, benzene, cyclohexanone, nitrocyclohexane, adhesives and perfumes; added to lacquers and resins, paint and varnish removers and fungicides; used as a fuel for camp stoves
dibromochloromethane	small amounts are formed naturally by plants in the ocean; formed as byproducts when chlorine is added to drinking water to kill bacteria; were used in the past as solvents and flame retardants or to make other chemicals; small quantities are produced in the US and used mainly as laboratory reagents
dichlorodifluoromethane	used as a refrigerant in air conditioning systems, as a blowing or foaming agent for aerosols, in fire extinguishers; banned in the US along with many other countries in 1994
dichlorotetrafluoromethane	used as a refrigerant in air conditioning systems, as a blowing or foaming agent for aerosols, in fire extinguishers
dichlorotetrafluoroethane	primary use has been as a refrigerant; found in consumer products, such as hair mousse and hairspray aerosol
ethylbenzene	found in natural products such as coal tar and petroleum; found in manufactured products such as inks, insecticides and paints; used primarily to make styrene; used as a solvent and in fuels; releases into the air occur from burning oil, gas and coal

COMPOUND	PRODUCT USE
Heptanes	produced and used as a solvent in organic synthesis and as a standard for octane-rating determinations; found in gasoline and petroleum-based products
hexachloro-1,3-butadiene	not found naturally in the environment, formed when other chemicals are made; mainly used to make rubber compounds; used as a solvent and to make lubricants, used in gyroscopes, as a heat transfer liquid and as a hydraulic fluid
Hexane	made from crude oil; pure <i>n</i> -Hexane is used in laboratories; mixed with similar chemicals called solvents and used to extract vegetable oils from crops such as soybeans; these solvents are also used as cleaning agents in the printing, textile, furniture, and shoemaking industries; used in certain kinds of special glues used in the roofing, shoe and leather industries; contained in several consumer products, such as gasoline, quick-drying glues and rubber cement, used in various hobbies
methyl ethyl ketone	manufactured chemical but it is also present in the environment from natural sources; produced in large quantities, nearly half of its use is in paints and other coatings; used in glues and as a cleaning agent; made by some trees and found in some fruits and vegetables in small amounts; also released to the air from car and truck exhausts
methyl isobutyl ketone	occurs naturally in certain foods and beverages; added to protective surface coatings, adhesives, printing ink, and special lubricating oils; used to make pesticides and to separate and purify several other organic; used to make textiles and leather; exposure can occur when people use certain paints, varnishes, or glues
methyl-t-butyl ether	was used since the 1980s as an additive for unleaded gasoline to achieve more efficient burning, today it is not being used and has been replaced by ethanol
methylbromide	manufactured chemical; also occurs naturally in small amounts in the ocean where it is formed, probably by algae and kelp; used to kill a variety of pests including rats, insects and fungi; used to make other chemicals or as a solvent to get oil out of nuts, seeds, and wool
methylchloride	used as a methylating agent, laboratory reagent, refrigerant, aerosol propellant, pesticide, fumigant, fire-extinguishing agent, anesthetic, degreaser, blowing agent for plastic foam and chemical intermediate; present at very low concentrations throughout the atmosphere
methylene chloride	does not occur naturally in the environment; used as an industrial solvent and as a paint stripper; found in some aerosol and pesticide products; used in the manufacture of photographic film
Styrene	found in insulation, fiberglass, plastic pipes, automobile parts, shoes, drinking cups and other food containers, carpet backing, tobacco smoke, automobile exhaust and off gases from photocopy machines; used to make plastics and rubber; occurs naturally in a variety of foods such as fruits, vegetables, nuts, beverages and meats
tetrachloroethene	used in dry cleaning and metal degreasing; used to make other chemicals and is used in some consumer products
tetrahydrofuran	used as a solvent for PVC, natural and synthetic resins; used as a monomer and chemical intermediate; used in varnishes
Toluene	occurs naturally in crude oil and in the tolu tree; produced in the process of making gasoline and other fuels from crude oil and making coke from coal; used in making paints, paint thinners, fingernail polish, lacquers, adhesives and rubber and in some printing and leather tanning processes; found in automobile exhaust and tobacco smoke

COMPOUND	PRODUCT USE
trichloroethene	used mainly as a solvent to remove grease from metal parts, is an ingredient in adhesives, paint removers, typewriter correction fluids and spot removers
trichlorofluoromethane	was used in consumer products including hair sprays, deodorants and cosmetics, in products to control home and garden insects and pests, in cleaners, spray paints and floor and furniture polish; in industry it was used as a refrigerant, to make foam and as an active part of liquid-type fire extinguishers; it is no longer made in the US
trichlorotrifluoroethane	does not occur naturally; EPA restricted production and after 1995 was significantly lower; used to clean metal surfaces, as a coolant in commercial and industrial air conditioners, as an ingredient in aerosols sprays, by foam makers as a blowing agent, to make high temperature lubricants and fluorocarbon resins and as a dry cleaning solvent
vinyl bromide	used primarily in the production of polymers and copolymers; used in polymers as a flame retardant and in the production of monoacrylic fibers for carpet-backing material; combined with acrylonitrile as a co-monomer, used to produce fabrics and fabric blends used in sleepwear (mostly children's) and home furnishings; when copolymerized with vinyl acetate and maleic anhydride, used to produce granular products; copolymers of vinyl chloride and vinyl bromide are used to prepare films, for impregnating or laminating fibers, and as rubber substitutes; used in leather and fabricated metal products
vinyl chloride	manufactured substance that does not occur naturally; formed when other substances such as trichloroethane, trichloroethylene, and tetrachloroethylene are broken down; used to make PVC, which is used to make a variety of plastic products, including pipes, wire and cable coatings and packaging materials.
cis-1,2-dichloroethene	used to produce solvents and in chemical mixtures
cis-1,3-dichloropropene	used mainly in farming as a pesticide
m/p/o-xylenes	occurs naturally in petroleum and coal tar; chemical industries produce xylene from petroleum; used as a solvent and in the printing, rubber, and leather industries; used as a cleaning agent, a thinner for paint and in paints and varnishes; found in small amounts in airplane fuel and gasoline and cigarette smoke
trans-1,2-dichloroethene	used to produce solvents and in chemical mixtures
trans-1,3-dichloropropene	used mainly in farming as a pesticide

Information Sources: <http://www.atsdr.cdc.gov>
<http://www.epa.gov/chemicalfact/>
<http://www.epa.gov/ttn/atw/>
<http://web.doh.state.nj.us>

