

# HARPER ENVIRONMENTAL

December 23, 2015

Mr. Mike Davidson  
Ledgeworks, Inc  
21 Water Street  
Lebanon, NH 03766

**Subject:** Soil Gas Air Sampling Results for Volatile Organic Compounds, 241 South Main Street, White River Junction, VT 05001

Dear Mr. Davidson,

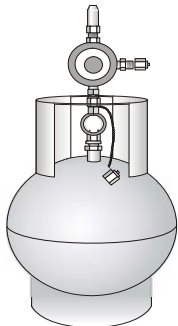
Thank you for the opportunity to complete the screening for volatile organic compounds (VOCs) from three sub-floor locations at 241 South Main Street in White River Junction, VT. Harper Environmental has completed a review of the air results we received from the analytical laboratory. Listed below are the laboratory results from the three VOC sample locations. The analytical laboratory reports as well as site maps are attached to this letter report. This report is subject to the enclosed Limitations.

## Overview

### **Air Sampling for Volatile Organic Compounds using SUMMA<sup>®</sup> Canisters**

Over the years many techniques have been used to sample for volatile organic compounds (VOCs) in ambient air. EPA Methods TO-14A and TO-15 (SUMMA Canisters) were designed for analysis of ambient air samples. These methods collect whole air samples in specially prepared stainless steel canisters, and analyze the samples by gas chromatograph/ mass spectrometer (GC/MS) methods.

Typically, the SUMMA canisters have settable flow controllers to allow for a time-weighted-average sample to be collected for times ranging from 40 minutes to 24 hours. A grab sample can easily be collected using the SUMMA canister as well. For this sampling event, a 1.4-liter SUMMA canister was used over a 2-hour period.



Analysis of whole air samples by GC/MS means that samples with concentrations ranging from parts per billion (ppbv) to parts per million (ppmv) can be analyzed and detected. The duration of the sampling is not limited by the expected concentration, but can be set with confidence before the samples are collected.

The canister is subject to many QA/QC protocols. Once the canister is received and checked for QA/QC compliance, it is positioned in the sampling location and the regulator is opened.

## **SCOPE OF WORK**

### **Soil Gas Sample Collection and Analysis**

On December 7, 2015, three soil gas samples from beneath the concrete floor of the former College Cleaners building in White River Junction were collected for VOC analysis using three, 1.2 liter SUMMA Canisters.

Prior to sampling, the 2013 Phase I ESA Report (KAS, Dec. 2013) was reviewed. Based on the description and locations of the tetrachloroethylene (PCE) drums stored inside the building, three inside locations were chose for sub-slab air testing. Three 1-inch diameter holes were drilled to 10-12 inches below grade through the concrete floor on December 2, 2015 (Figure 2, Site Map). The holes were sealed with a rubber plugs and a cover was placed on each hole. On December 7, 2015, Harper Environmental returned to the site removed the plugs, and placed plastic hose through rubber stoppers and into the three holes.

An air sampling pump was used to purge the air from the plastic hose for 1-minute. After purging, the tubes were connected to the vacuum regulator on the SUMMA canisters and sampling continued for a 2-hour period. After sampling, the three holes were plugged.

#### **Sub-Slab Soil Gas locations included:**

V-1 Adjacent to the back south wall near the door and dry cleaning machine 3

V-2 Between dry cleaning machine 1 & 2

V-3 In the middle of the floor south of the washing machines

### **Results of the Air Sampling Event- Sub Slab VOCs**

Two-hour, SUMMA canisters were used to analyze VOCs in the sub-floor air space at the former College Cleaners building. The air samples were analyzed at Phoenix Analytical Labs using EPA Method TO-15 and the following compounds were detected above the method detection limit.

The compounds detected in the air samples included:

- PCE, typically used as a dry cleaning fluid
- Dichlorodifluoromethane, a common refrigerant (Freon-12)
- Ethanol (ethyl alcohol) has widespread use as a solvent of substances intended for human contact or consumption, including scents, flavorings, colorings, and medicines. Lysol Anti-bacterial Action Spray contains 79% ethanol.
- Isopropyl Alcohol is a common cleaning agent and a solvent of often makes up 60-70% of the mixture of disinfecting wipes.

The VOC soil gas results are reported in Table 1 as parts per billion- volume and micrograms per cubic meter. These results indicate abnormally high levels of PCE from all vapor points. These results would be considered unhealthy if found in a breathing zone, particularly in a residential environment.

The Vermont Vapor Intrusion Screening Level (VISV) listed in the April 2012 Investigation & Remediation of Contaminated Properties Procedure as the Target Indoor Air Concentration for PCE is .57 ug/m<sup>3</sup> and 5.7 ug/m<sup>3</sup> for shallow soil gas levels.

**Table 1: Sub-slab Soil Gas Results for Volatile Organic Compounds;  
241 S. Main Street, White River Junction, VT**

<b>College Cleaners- WRJ Dec. 07, 2015</b>	<b>Air Sampling Locations</b>	<b>PCE ppbv</b>	<b>PCE ug/m3</b>	<b>Other Compounds (ppb)</b>
<b>V-1</b>	<b>Back wall (south) of the drycleaner bldg. adjacent to the door</b>	<b>109</b>	<b>739</b>	<b>R-12 Freon- 167 Ethanol- 6.48 Isopropyl alcohol- 2.99</b>
<b>V-2</b>	<b>Between dry cleaning machines 1 &amp; 2</b>	<b>713</b>	<b>4,830</b>	<b>R-12 Freon- 764</b>
<b>V-3</b>	<b>Middle of floor, south of washing machines</b>	<b>77.9</b>	<b>528</b>	<b>R-12 Freon- 279 Isopropyl alcohol- 3.91</b>
<b>VISV</b>	<b>Target Indoor Air Concentration</b>		<b>.57</b>	
<b>VISV</b>	<b>Shallow Soil Gas &lt;5ft alpha 0.1</b>		<b>5.7</b>	

- **Vermont Vapor Intrusion Screening Level (VISV):** April 2012 Inv. & Remediation of Contaminated Properties Procedure- Target Indoor Air Concentration for PCE .57 ug/m3
- Attenuation factors (alpha  $\alpha$ ) factors of 0.1 and 0.01 for shallow soil gas and deep soil gas, respectively, were used to calculate the soil gas screening values with exception of petroleum related compounds.
- PCE- tetrachloroethene, tetrachloroethylene or perchloroethene (PERC), dry cleaning fluid
- PCE is degraded by reductive dechlorination processes under anaerobic conditions, with degradation products including trichloroethylene, dichloroethylene, vinyl chloride, ethylene, and ethane
- All air samples were collected using a 2-hour SUMMA Canister and analyzed using EPA Method TO-15
- R-12: Dichlorodifluoromethane (R-12) is a colorless gas usually labeled under the brand name Freon-12, and a chlorofluorocarbon halomethane (CFC) used as a refrigerant and aerosol spray propellant. The manufacture was universally banned in 1996 due to concerns about its damaging impact to the ozone layer
- If Freon is spilled onto soil, a portion may evaporate from the surface and the remainder will leach downward into the soil. Mobility through the soil is expected to be moderate based on estimated Koc values. Freon does not bind well to soil, and leaching to groundwater is possible. (California OEHHA Technical Support Document, Vol.1 No. 11)
- Ethanol and Isopropyl alcohol are used as laboratory solvents and may have cross-contaminated the air sample. These chemicals are also commonly found in cleaning products.

Based on the information we received from the recent sampling event, we offer the following comments:

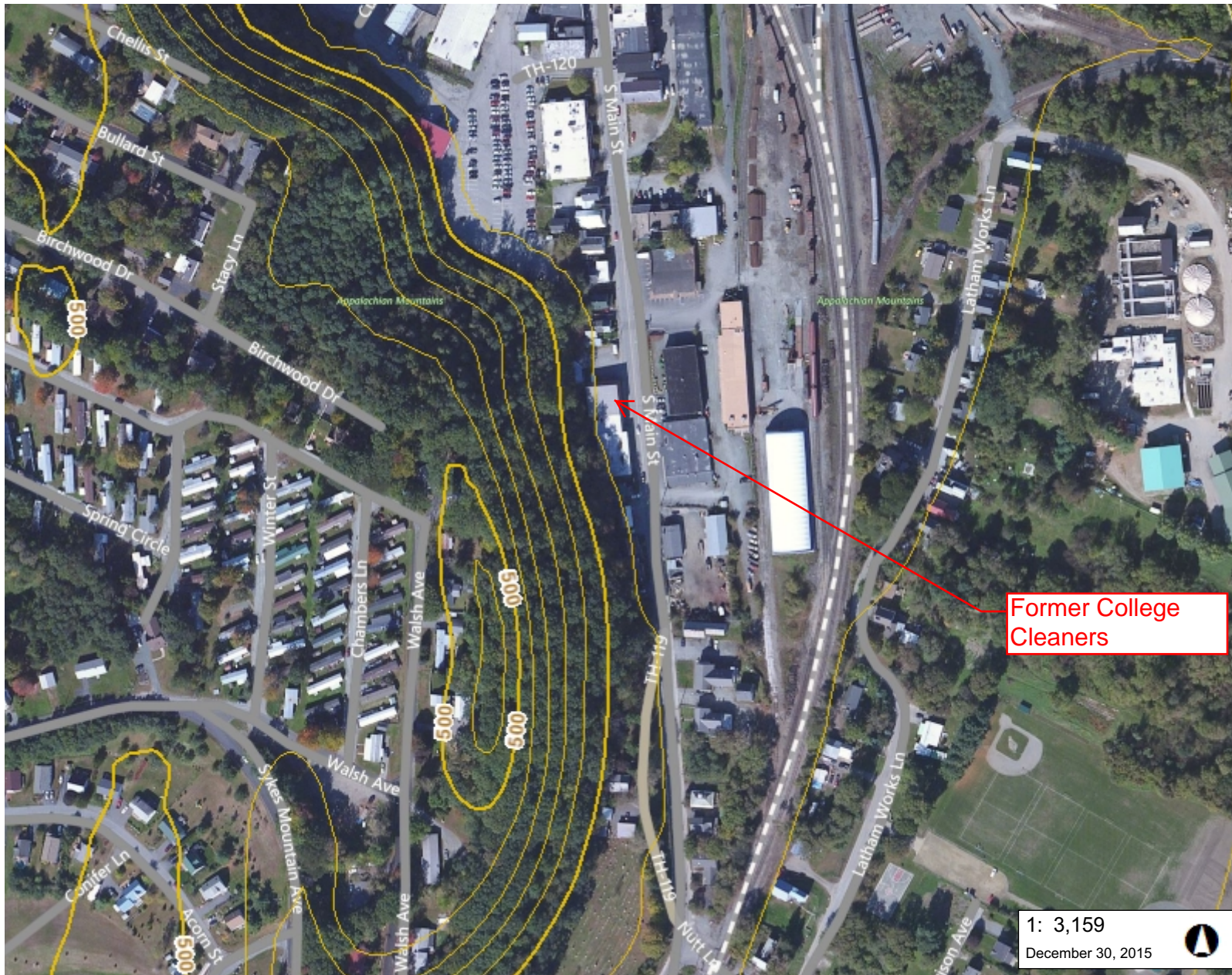
- The VOC results indicate an unusual presence of PCE in the soil gas below the floor from all three sampling points.
- The PCE results are likely from the use/transfer of PCE as a dry cleaning fluid used inside the building.
- PCE levels are highest from the two vapor points located adjacent to the dry cleaning machines.
- Cross-contamination between the ambient air in the building and the soil gas is possible due to the presence of dry cleaning equipment. Further assessment of the soil gas will use sealed points that will be discussed in the site investigation plan.
- The R-12 Freon results require discussions with the former owner prior to determining its origin.
- The alcohol and ethanol compounds detected in the test results are likely from cleaning products used to clean the room, from supplies stored in the room, or from laboratory interference.
- We recommend the completion of a comprehensive site investigation in order to assess the soil gas below the entire building, the liquids from the floor drain/trench system, and the ambient air in the former dry cleaning building.

Thank you for the opportunity to provide environmental consulting services for this project. If you have any questions or need additional information, please call us at your convenience.

Sincerely,  
**HARPER ENVIRONMENTAL ASSOCIATES, Inc.**

Cliff Harper, PG  
Hydrogeologist

Attachments:  
Figure 1: Site Location Map  
Figure 2: Site Map  
VOC Analytical Results- Phoenix Analytical Labs  
Site Photographs



### LEGEND

Town Boundary

FIGURE 1

1: 3,159

December 30, 2015



### NOTES

Map created using ANR's Natural Resources Atlas

160.0 0 80.00 160.0 Meters

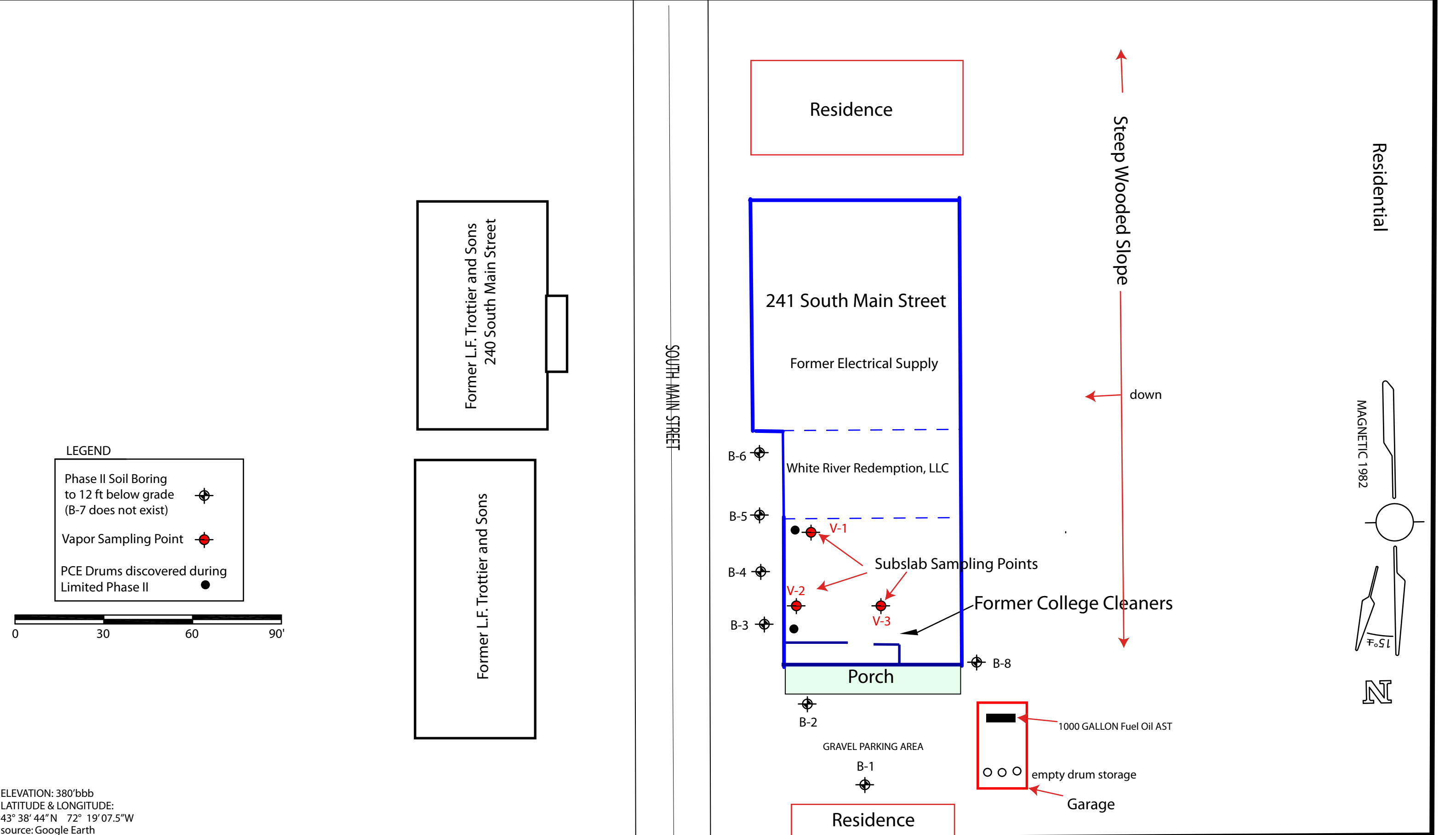
WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

1" = 263 Ft. 1cm = 32 Meters

© Vermont Agency of Natural Resources

THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.



ELEVATION: 380'bbb  
 LATITUDE & LONGITUDE:  
 43° 38' 44" N 72° 19' 07.5" W  
 source: Google Earth



**Harper Environmental Associates**  
 1811 Hale Hollow Road  
 Bridgewater Corners, VT 05035  
 (802) 672-6112 FAX: (802) 672-6227  
 charper@sover.net

**SITE MAP -DECEMBER 2015**  
**Fmr. College Cleaners**  
 241 S. Main Street, White River Junction, VT

SCALE: 1"= 30'  
 DESIGNED BY: CJH  
 DRAWN BY: CS  
 CHECKED BY: CJH  
 DATE: 12/08/2015  
 PROJ. NO. Temp121515

**FIGURE**  
**2**



Thursday, December 10, 2015

Attn: Mr. Cliff Harper  
Harper Environmental Associates  
1811 Hale Hollow Rd  
Bridgewater Corners, VT 05035

Project ID: S MAIN ST WRJ  
Sample ID#s: BK33744 - BK33746

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

A handwritten signature in black ink that reads "Phyllis Shiller". The signature is written in a cursive style.

Phyllis Shiller  
Laboratory Director

NELAC - #NY11301  
CT Lab Registration #PH-0618  
MA Lab Registration #MA-CT-007  
ME Lab Registration #CT-007  
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003  
NY Lab Registration #11301  
PA Lab Registration #68-03530  
RI Lab Registration #63  
VT Lab Registration #VT11301



Environmental Laboratories, Inc.  
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
Tel. (860) 645-1102 Fax (860) 645-0823

# Analysis Report

December 10, 2015

FOR: Attn: Mr. Cliff Harper  
Harper Environmental Associates  
1811 Hale Hollow Rd  
Bridgewater Corners, VT 05035

## Sample Information

Matrix: AIR  
Location Code: HARPER  
Rush Request: Standard  
P.O.#:  
Canister Id: 737

## Custody Information

Collected by: CH  
Received by: LK  
Analyzed by: see "By" below

## Date

12/07/15 14:00  
12/08/15 10:40

## Time

Project ID: S MAIN ST WRJ  
Client ID: V-1

## Laboratory Data

SDG ID: GBK33744  
Phoenix ID: BK33744

Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
<b><u>Volatiles (TO15)</u></b>							
1,1,1,2-Tetrachloroethane	ND	2.50	ND	17.2	12/08/15	KCA	5
1,1,1-Trichloroethane	ND	2.50	ND	13.6	12/08/15	KCA	5
1,1,2,2-Tetrachloroethane	ND	2.50	ND	17.2	12/08/15	KCA	5
1,1,2-Trichloroethane	ND	2.50	ND	13.6	12/08/15	KCA	5
1,1-Dichloroethane	ND	2.50	ND	10.1	12/08/15	KCA	5
1,1-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
1,2,4-Trichlorobenzene	ND	2.50	ND	18.5	12/08/15	KCA	5
1,2,4-Trimethylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
1,2-Dibromoethane(EDB)	ND	2.50	ND	19.2	12/08/15	KCA	5
1,2-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,2-Dichloroethane	ND	2.50	ND	10.1	12/08/15	KCA	5
1,2-dichloropropane	ND	2.50	ND	11.5	12/08/15	KCA	5
1,2-Dichlorotetrafluoroethane	ND	2.50	ND	17.5	12/08/15	KCA	5
1,3,5-Trimethylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
1,3-Butadiene	ND	2.50	ND	5.53	12/08/15	KCA	5
1,3-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,4-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,4-Dioxane	ND	2.50	ND	9.00	12/08/15	KCA	5
2-Hexanone(MBK)	ND	2.50	ND	10.2	12/08/15	KCA	5
4-Ethyltoluene	ND	2.50	ND	12.3	12/08/15	KCA	5
4-Isopropyltoluene	ND	2.50	ND	13.7	12/08/15	KCA	5
4-Methyl-2-pentanone(MIBK)	ND	2.50	ND	10.2	12/08/15	KCA	5
Acetone	ND	2.50	ND	5.93	12/08/15	KCA	5
Acrylonitrile	ND	2.50	ND	5.42	12/08/15	KCA	5
Benzene	ND	2.50	ND	7.98	12/08/15	KCA	5
Benzyl chloride	ND	2.50	ND	12.9	12/08/15	KCA	5



Client ID: V-1

Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
Bromodichloromethane	ND	2.50	ND	16.7	12/08/15	KCA	5
Bromoform	ND	2.50	ND	25.8	12/08/15	KCA	5
Bromomethane	ND	2.50	ND	9.7	12/08/15	KCA	5
Carbon Disulfide	ND	2.50	ND	7.78	12/08/15	KCA	5
Carbon Tetrachloride	ND	2.50	ND	15.7	12/08/15	KCA	5
Chlorobenzene	ND	2.50	ND	11.5	12/08/15	KCA	5
Chloroethane	ND	2.50	ND	6.59	12/08/15	KCA	5
Chloroform	ND	2.50	ND	12.2	12/08/15	KCA	5
Chloromethane	ND	2.50	ND	5.16	12/08/15	KCA	5
Cis-1,2-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
cis-1,3-Dichloropropene	ND	2.50	ND	11.3	12/08/15	KCA	5
Cyclohexane	ND	2.50	ND	8.60	12/08/15	KCA	5
Dibromochloromethane	ND	2.50	ND	21.3	12/08/15	KCA	5
Dichlorodifluoromethane	167	2.50	825	12.4	12/08/15	KCA	5
Ethanol	6.48	S 2.50	12.2	4.71	12/08/15	KCA	5
Ethyl acetate	ND	2.50	ND	9.00	12/08/15	KCA	5
Ethylbenzene	ND	2.50	ND	10.8	12/08/15	KCA	5
Heptane	ND	2.50	ND	10.2	12/08/15	KCA	5
Hexachlorobutadiene	ND	2.50	ND	26.6	12/08/15	KCA	5
Hexane	ND	2.50	ND	8.81	12/08/15	KCA	5
Isopropylalcohol	2.99	S 2.50	7.35	6.14	12/08/15	KCA	5
Isopropylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
m,p-Xylene	ND	5.00	ND	21.7	12/08/15	KCA	5
Methyl Ethyl Ketone	ND	2.50	ND	7.37	12/08/15	KCA	5
Methyl tert-butyl ether(MTBE)	ND	2.50	ND	9.01	12/08/15	KCA	5
Methylene Chloride	ND	2.50	ND	8.68	12/08/15	KCA	5
n-Butylbenzene	ND	2.50	ND	13.7	12/08/15	KCA	5
o-Xylene	ND	2.50	ND	10.8	12/08/15	KCA	5
Propylene	ND	2.50	ND	4.30	12/08/15	KCA	5
sec-Butylbenzene	ND	2.50	ND	13.7	12/08/15	KCA	5
Styrene	ND	2.50	ND	10.6	12/08/15	KCA	5
Tetrachloroethene	109	2.50	739	16.9	12/08/15	KCA	5
Tetrahydrofuran	ND	2.50	ND	7.37	12/08/15	KCA	5
Toluene	ND	2.50	ND	9.42	12/08/15	KCA	5
Trans-1,2-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
trans-1,3-Dichloropropene	ND	2.50	ND	11.3	12/08/15	KCA	5
Trichloroethene	ND	2.50	ND	13.4	12/08/15	KCA	5
Trichlorofluoromethane	ND	2.50	ND	14.0	12/08/15	KCA	5
Trichlorotrifluoroethane	ND	2.50	ND	19.1	12/08/15	KCA	5
Vinyl Chloride	ND	2.50	ND	6.39	12/08/15	KCA	5
<b><u>QA/QC Surrogates</u></b>							
% Bromofluorobenzene	102	%	102	%	12/08/15	KCA	5

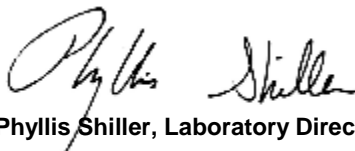
Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

S - Laboratory solvent, contamination is possible.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.  
This report must not be reproduced except in full as defined by the attached chain of custody.



**Phyllis Shiller, Laboratory Director**

**December 10, 2015**

**Reviewed and Released by: Greg Lawrence, Assistant Lab Director**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 December 10, 2015

FOR: Attn: Mr. Cliff Harper  
 Harper Environmental Associates  
 1811 Hale Hollow Rd  
 Bridgewater Corners, VT 05035

Sample Information

Matrix: AIR  
 Location Code: HARPER  
 Rush Request: Standard  
 P.O.#:  
 Canister Id: 817

Custody Information

Collected by: CH  
 Received by: LK  
 Analyzed by: see "By" below

Date

12/07/15 13:59  
 12/08/15 10:40

Time

Project ID: S MAIN ST WRJ  
 Client ID: V-2

Laboratory Data

SDG ID: GBK33744  
 Phoenix ID: BK33745

Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
<b><u>Volatiles (TO15)</u></b>							
1,1,1,2-Tetrachloroethane	ND	2.50	ND	17.2	12/08/15	KCA	5
1,1,1-Trichloroethane	ND	2.50	ND	13.6	12/08/15	KCA	5
1,1,2,2-Tetrachloroethane	ND	2.50	ND	17.2	12/08/15	KCA	5
1,1,2-Trichloroethane	ND	2.50	ND	13.6	12/08/15	KCA	5
1,1-Dichloroethane	ND	2.50	ND	10.1	12/08/15	KCA	5
1,1-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
1,2,4-Trichlorobenzene	ND	2.50	ND	18.5	12/08/15	KCA	5
1,2,4-Trimethylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
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1,3,5-Trimethylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
1,3-Butadiene	ND	2.50	ND	5.53	12/08/15	KCA	5
1,3-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,4-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,4-Dioxane	ND	2.50	ND	9.00	12/08/15	KCA	5
2-Hexanone(MBK)	ND	2.50	ND	10.2	12/08/15	KCA	5
4-Ethyltoluene	ND	2.50	ND	12.3	12/08/15	KCA	5
4-Isopropyltoluene	ND	2.50	ND	13.7	12/08/15	KCA	5
4-Methyl-2-pentanone(MIBK)	ND	2.50	ND	10.2	12/08/15	KCA	5
Acetone	ND	2.50	ND	5.93	12/08/15	KCA	5
Acrylonitrile	ND	2.50	ND	5.42	12/08/15	KCA	5
Benzene	ND	2.50	ND	7.98	12/08/15	KCA	5
Benzyl chloride	ND	2.50	ND	12.9	12/08/15	KCA	5

Client ID: V-2

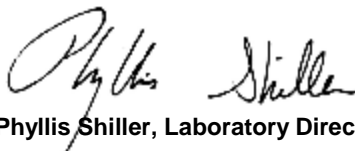
Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
Bromodichloromethane	ND	2.50	ND	16.7	12/08/15	KCA	5
Bromoform	ND	2.50	ND	25.8	12/08/15	KCA	5
Bromomethane	ND	2.50	ND	9.7	12/08/15	KCA	5
Carbon Disulfide	ND	2.50	ND	7.78	12/08/15	KCA	5
Carbon Tetrachloride	ND	2.50	ND	15.7	12/08/15	KCA	5
Chlorobenzene	ND	2.50	ND	11.5	12/08/15	KCA	5
Chloroethane	ND	2.50	ND	6.59	12/08/15	KCA	5
Chloroform	ND	2.50	ND	12.2	12/08/15	KCA	5
Chloromethane	ND	2.50	ND	5.16	12/08/15	KCA	5
Cis-1,2-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
cis-1,3-Dichloropropene	ND	2.50	ND	11.3	12/08/15	KCA	5
Cyclohexane	ND	2.50	ND	8.60	12/08/15	KCA	5
Dibromochloromethane	ND	2.50	ND	21.3	12/08/15	KCA	5
Dichlorodifluoromethane	764	15.0	3780	74.1	12/09/15	KCA	30
Ethanol	ND	2.50	ND	4.71	12/08/15	KCA	5
Ethyl acetate	ND	2.50	ND	9.00	12/08/15	KCA	5
Ethylbenzene	ND	2.50	ND	10.8	12/08/15	KCA	5
Heptane	ND	2.50	ND	10.2	12/08/15	KCA	5
Hexachlorobutadiene	ND	2.50	ND	26.6	12/08/15	KCA	5
Hexane	ND	2.50	ND	8.81	12/08/15	KCA	5
Isopropylalcohol	ND	2.50	ND	6.14	12/08/15	KCA	5
Isopropylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
m,p-Xylene	ND	5.00	ND	21.7	12/08/15	KCA	5
Methyl Ethyl Ketone	ND	2.50	ND	7.37	12/08/15	KCA	5
Methyl tert-butyl ether(MTBE)	ND	2.50	ND	9.01	12/08/15	KCA	5
Methylene Chloride	ND	2.50	ND	8.68	12/08/15	KCA	5
n-Butylbenzene	ND	2.50	ND	13.7	12/08/15	KCA	5
o-Xylene	ND	2.50	ND	10.8	12/08/15	KCA	5
Propylene	ND	2.50	ND	4.30	12/08/15	KCA	5
sec-Butylbenzene	ND	2.50	ND	13.7	12/08/15	KCA	5
Styrene	ND	2.50	ND	10.6	12/08/15	KCA	5
Tetrachloroethene	713	15.0	4830	102	12/09/15	KCA	30
Tetrahydrofuran	ND	2.50	ND	7.37	12/08/15	KCA	5
Toluene	ND	2.50	ND	9.42	12/08/15	KCA	5
Trans-1,2-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
trans-1,3-Dichloropropene	ND	2.50	ND	11.3	12/08/15	KCA	5
Trichloroethene	ND	2.50	ND	13.4	12/08/15	KCA	5
Trichlorofluoromethane	ND	2.50	ND	14.0	12/08/15	KCA	5
Trichlorotrifluoroethane	ND	2.50	ND	19.1	12/08/15	KCA	5
Vinyl Chloride	ND	2.50	ND	6.39	12/08/15	KCA	5
<b><u>QA/QC Surrogates</u></b>							
% Bromofluorobenzene	99	%	99	%	12/08/15	KCA	5

Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
-----------	----------------	------------	-----------------	-------------	-----------	----	----------

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.  
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**Phyllis Shiller, Laboratory Director**

**December 10, 2015**

**Reviewed and Released by: Greg Lawrence, Assistant Lab Director**



Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

**Analysis Report**  
 December 10, 2015

FOR: Attn: Mr. Cliff Harper  
 Harper Environmental Associates  
 1811 Hale Hollow Rd  
 Bridgewater Corners, VT 05035

Sample Information

Matrix: AIR  
 Location Code: HARPER  
 Rush Request: Standard  
 P.O.#:  
 Canister Id: 775

Custody Information

Collected by: CH  
 Received by: LK  
 Analyzed by: see "By" below

Date

12/07/15 13:57  
 12/08/15 10:40

Time

Project ID: S MAIN ST WRJ  
 Client ID: V-3

Laboratory Data

SDG ID: GBK33744  
 Phoenix ID: BK33746

Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
<b><u>Volatiles (TO15)</u></b>							
1,1,1,2-Tetrachloroethane	ND	2.50	ND	17.2	12/08/15	KCA	5
1,1,1-Trichloroethane	ND	2.50	ND	13.6	12/08/15	KCA	5
1,1,2,2-Tetrachloroethane	ND	2.50	ND	17.2	12/08/15	KCA	5
1,1,2-Trichloroethane	ND	2.50	ND	13.6	12/08/15	KCA	5
1,1-Dichloroethane	ND	2.50	ND	10.1	12/08/15	KCA	5
1,1-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
1,2,4-Trichlorobenzene	ND	2.50	ND	18.5	12/08/15	KCA	5
1,2,4-Trimethylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
1,2-Dibromoethane(EDB)	ND	2.50	ND	19.2	12/08/15	KCA	5
1,2-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,2-Dichloroethane	ND	2.50	ND	10.1	12/08/15	KCA	5
1,2-dichloropropane	ND	2.50	ND	11.5	12/08/15	KCA	5
1,2-Dichlorotetrafluoroethane	ND	2.50	ND	17.5	12/08/15	KCA	5
1,3,5-Trimethylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
1,3-Butadiene	ND	2.50	ND	5.53	12/08/15	KCA	5
1,3-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,4-Dichlorobenzene	ND	2.50	ND	15.0	12/08/15	KCA	5
1,4-Dioxane	ND	2.50	ND	9.00	12/08/15	KCA	5
2-Hexanone(MBK)	ND	2.50	ND	10.2	12/08/15	KCA	5
4-Ethyltoluene	ND	2.50	ND	12.3	12/08/15	KCA	5
4-Isopropyltoluene	ND	2.50	ND	13.7	12/08/15	KCA	5
4-Methyl-2-pentanone(MIBK)	ND	2.50	ND	10.2	12/08/15	KCA	5
Acetone	ND	2.50	ND	5.93	12/08/15	KCA	5
Acrylonitrile	ND	2.50	ND	5.42	12/08/15	KCA	5
Benzene	ND	2.50	ND	7.98	12/08/15	KCA	5
Benzyl chloride	ND	2.50	ND	12.9	12/08/15	KCA	5

Client ID: V-3

Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
Bromodichloromethane	ND	2.50	ND	16.7	12/08/15	KCA	5
Bromoform	ND	2.50	ND	25.8	12/08/15	KCA	5
Bromomethane	ND	2.50	ND	9.7	12/08/15	KCA	5
Carbon Disulfide	ND	2.50	ND	7.78	12/08/15	KCA	5
Carbon Tetrachloride	ND	2.50	ND	15.7	12/08/15	KCA	5
Chlorobenzene	ND	2.50	ND	11.5	12/08/15	KCA	5
Chloroethane	ND	2.50	ND	6.59	12/08/15	KCA	5
Chloroform	ND	2.50	ND	12.2	12/08/15	KCA	5
Chloromethane	ND	2.50	ND	5.16	12/08/15	KCA	5
Cis-1,2-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
cis-1,3-Dichloropropene	ND	2.50	ND	11.3	12/08/15	KCA	5
Cyclohexane	ND	2.50	ND	8.60	12/08/15	KCA	5
Dibromochloromethane	ND	2.50	ND	21.3	12/08/15	KCA	5
Dichlorodifluoromethane	279	5.00	1380	24.7	12/09/15	KCA	10
Ethanol	ND	2.50	ND	4.71	12/08/15	KCA	5
Ethyl acetate	ND	2.50	ND	9.00	12/08/15	KCA	5
Ethylbenzene	ND	2.50	ND	10.8	12/08/15	KCA	5
Heptane	ND	2.50	ND	10.2	12/08/15	KCA	5
Hexachlorobutadiene	ND	2.50	ND	26.6	12/08/15	KCA	5
Hexane	ND	2.50	ND	8.81	12/08/15	KCA	5
Isopropylalcohol	3.91	S 2.50	9.6	6.14	12/08/15	KCA	5
Isopropylbenzene	ND	2.50	ND	12.3	12/08/15	KCA	5
m,p-Xylene	ND	5.00	ND	21.7	12/08/15	KCA	5
Methyl Ethyl Ketone	ND	2.50	ND	7.37	12/08/15	KCA	5
Methyl tert-butyl ether(MTBE)	ND	2.50	ND	9.01	12/08/15	KCA	5
Methylene Chloride	ND	2.50	ND	8.68	12/08/15	KCA	5
n-Butylbenzene	ND	2.50	ND	13.7	12/08/15	KCA	5
o-Xylene	ND	2.50	ND	10.8	12/08/15	KCA	5
Propylene	ND	2.50	ND	4.30	12/08/15	KCA	5
sec-Butylbenzene	ND	2.50	ND	13.7	12/08/15	KCA	5
Styrene	ND	2.50	ND	10.6	12/08/15	KCA	5
Tetrachloroethene	77.9	2.50	528	16.9	12/08/15	KCA	5
Tetrahydrofuran	ND	2.50	ND	7.37	12/08/15	KCA	5
Toluene	ND	2.50	ND	9.42	12/08/15	KCA	5
Trans-1,2-Dichloroethene	ND	2.50	ND	9.9	12/08/15	KCA	5
trans-1,3-Dichloropropene	ND	2.50	ND	11.3	12/08/15	KCA	5
Trichloroethene	ND	2.50	ND	13.4	12/08/15	KCA	5
Trichlorofluoromethane	ND	2.50	ND	14.0	12/08/15	KCA	5
Trichlorotrifluoroethane	ND	2.50	ND	19.1	12/08/15	KCA	5
Vinyl Chloride	ND	2.50	ND	6.39	12/08/15	KCA	5
<b><u>QA/QC Surrogates</u></b>							
% Bromofluorobenzene	103	%	103	%	12/08/15	KCA	5

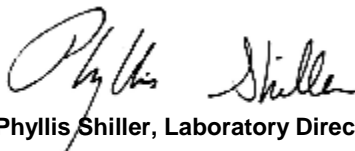
Parameter	ppbv Result	ppbv RL	ug/m3 Result	ug/m3 RL	Date/Time	By	Dilution
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RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level  
QA/QC Surrogates: Surrogates are compounds (preceeded with a %) added by the lab to determine analysis efficiency. Surrogate results(%) listed in the report are not "detected" compounds.

**Comments:**

S - Laboratory solvent, contamination is possible.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.  
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**Phyllis Shiller, Laboratory Director**

**December 10, 2015**

**Reviewed and Released by: Greg Lawrence, Assistant Lab Director**





Environmental Laboratories, Inc.  
 587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045  
 Tel. (860) 645-1102 Fax (860) 645-0823

# QA/QC Report

December 10, 2015

## QA/QC Data

SDG I.D.: GBK33744

Parameter	Blk ppbv	Blk RL ppbv	Blk ug/m3	Blk RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits
QA/QC Batch 329007 (ppbv), QC Sample No: BK34096 (BK33744 (5X) , BK33745 (5X, 30X) , BK33746 (5X, 10X) )												
<b>Volatiles</b>												
1,1,1,2-Tetrachloroethane	ND	0.146	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	20
1,1,1-Trichloroethane	ND	0.183	ND	1.00	97	ND	ND	ND	ND	NC	70 - 130	20
1,1,2,2-Tetrachloroethane	ND	0.146	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	20
1,1,2-Trichloroethane	ND	0.183	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	20
1,1-Dichloroethane	ND	0.247	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	20
1,1-Dichloroethene	ND	0.252	ND	1.00	99	ND	ND	ND	ND	NC	70 - 130	20
1,2,4-Trichlorobenzene	ND	0.135	ND	1.00	133	ND	ND	ND	ND	NC	70 - 130	20
1,2,4-Trimethylbenzene	ND	0.204	ND	1.00	110	6.73	6.68	1.37	1.36	0.7	70 - 130	20
1,2-Dibromoethane(EDB)	ND	0.130	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	20
1,2-Dichlorobenzene	ND	0.166	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	20
1,2-Dichloroethane	ND	0.247	ND	1.00	96	ND	ND	ND	ND	NC	70 - 130	20
1,2-dichloropropane	ND	0.216	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	20
1,2-Dichlorotetrafluoroethane	ND	0.143	ND	1.00	94	ND	ND	ND	ND	NC	70 - 130	20
1,3,5-Trimethylbenzene	ND	0.204	ND	1.00	107	2.10	2.11	0.428	0.430	0.5	70 - 130	20
1,3-Butadiene	ND	0.452	ND	1.00	90	ND	ND	ND	ND	NC	70 - 130	20
1,3-Dichlorobenzene	ND	0.166	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	20
1,4-Dichlorobenzene	ND	0.166	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	20
1,4-Dioxane	ND	0.278	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	20
2-Hexanone(MBK)	ND	0.244	ND	1.00	109	ND	ND	ND	ND	NC	70 - 130	20
4-Ethyltoluene	ND	0.204	ND	1.00	104	3.42	3.46	0.697	0.705	1.1	70 - 130	20
4-Isopropyltoluene	ND	0.182	ND	1.00	107	ND	ND	ND	ND	NC	70 - 130	20
4-Methyl-2-pentanone(MIBK)	ND	0.244	ND	1.00	101	12.7	12.8	3.10	3.12	0.6	70 - 130	20
Acetone	ND	0.421	ND	1.00	84	80.0	80.0	33.7	33.7	0.0	70 - 130	20
Acrylonitrile	ND	0.461	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	20
Benzene	ND	0.313	ND	1.00	99	22.3	22.3	6.97	6.99	0.3	70 - 130	20
Benzyl chloride	ND	0.193	ND	1.00	100	ND	ND	ND	ND	NC	70 - 130	20
Bromodichloromethane	ND	0.149	ND	1.00	100	ND	ND	ND	ND	NC	70 - 130	20
Bromoform	ND	0.097	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	20
Bromomethane	ND	0.257	ND	1.00	95	ND	ND	ND	ND	NC	70 - 130	20
Carbon Disulfide	ND	0.321	ND	1.00	102	4.89	4.82	1.57	1.55	1.3	70 - 130	20
Carbon Tetrachloride	ND	0.040	ND	0.25	98	3.42	3.50	0.544	0.556	2.2	70 - 130	20
Chlorobenzene	ND	0.217	ND	1.00	103	ND	ND	ND	ND	NC	70 - 130	20
Chloroethane	ND	0.379	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	20
Chloroform	ND	0.205	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	20
Chloromethane	ND	0.484	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	20
Cis-1,2-Dichloroethene	ND	0.256	ND	1.01	100	ND	ND	ND	ND	NC	70 - 130	20
cis-1,3-Dichloropropene	ND	0.220	ND	1.00	104	ND	ND	ND	ND	NC	70 - 130	20
Cyclohexane	ND	0.291	ND	1.00	101	3.37	3.36	0.979	0.976	0.3	70 - 130	20
Dibromochloromethane	ND	0.117	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	20
Dichlorodifluoromethane	ND	0.202	ND	1.00	97	2.46	2.42	0.498	0.490	1.6	70 - 130	20
Ethanol	ND	0.531	ND	1.00	94	11.2	11.4	5.93	6.05	2.0	70 - 130	20

## QA/QC Data

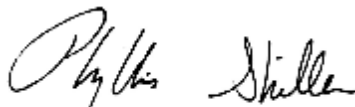
SDG I.D.: GBK33744

Parameter	Bik ppbv	Bik RL ppbv	Bik ug/m3	Bik RL ug/m3	LCS %	Sample Result ug/m3	Sample Dup ug/m3	Sample Result ppbv	Sample Dup ppbv	DUP RPD	% Rec Limits	% RPD Limits
Ethyl acetate	ND	0.278	ND	1.00	91	ND	ND	ND	ND	NC	70 - 130	20
Ethylbenzene	ND	0.230	ND	1.00	102	3.51	3.52	0.808	0.812	0.5	70 - 130	20
Heptane	ND	0.244	ND	1.00	100	2.28	2.04	0.557	0.499	11.0	70 - 130	20
Hexachlorobutadiene	ND	0.094	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	20
Hexane	ND	0.284	ND	1.00	111	4.02 S	4.09 S	1.14 S	1.16 S	1.7	70 - 130	20
Isopropylalcohol	ND	0.407	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	20
Isopropylbenzene	ND	0.204	ND	1.00	102	ND	ND	ND	ND	NC	70 - 130	20
m,p-Xylene	ND	0.230	ND	1.00	105	12.8	12.9	2.96	2.97	0.3	70 - 130	20
Methyl Ethyl Ketone	ND	0.339	ND	1.00	97	13.6	13.6	4.61	4.61	0.0	70 - 130	20
Methyl tert-butyl ether(MTBE)	ND	0.277	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	20
Methylene Chloride	ND	0.288	ND	1.00	98	ND	ND	ND	ND	NC	70 - 130	20
n-Butylbenzene	ND	0.182	ND	1.00	106	ND	ND	ND	ND	NC	70 - 130	20
o-Xylene	ND	0.230	ND	1.00	108	2.34	2.42	0.539	0.558	3.5	70 - 130	20
Propylene	ND	0.581	ND	1.00	87	ND	ND	ND	ND	NC	70 - 130	20
sec-Butylbenzene	ND	0.182	ND	1.00	110	ND	ND	ND	ND	NC	70 - 130	20
Styrene	ND	0.235	ND	1.00	79	ND	ND	ND	ND	NC	70 - 130	20
Tetrachloroethene	ND	0.037	ND	0.25	99	3.06	2.96	0.452	0.437	3.4	70 - 130	20
Tetrahydrofuran	ND	0.339	ND	1.00	94	1.07	1.10	0.362	0.373	3.0	70 - 130	20
Toluene	ND	0.266	ND	1.00	102	16.2	16.3	4.30	4.33	0.7	70 - 130	20
Trans-1,2-Dichloroethene	ND	0.252	ND	1.00	101	ND	ND	ND	ND	NC	70 - 130	20
trans-1,3-Dichloropropene	ND	0.220	ND	1.00	100	ND	ND	ND	ND	NC	70 - 130	20
Trichloroethene	ND	0.047	ND	0.25	102	0.68	0.70	0.126	0.131	3.9	70 - 130	20
Trichlorofluoromethane	ND	0.178	ND	1.00	98	1.24	1.21	0.220	0.215	2.3	70 - 130	20
Trichlorotrifluoroethane	ND	0.131	ND	1.00	100	ND	ND	ND	ND	NC	70 - 130	20
Vinyl Chloride	ND	0.098	ND	0.25	99	ND	ND	ND	ND	NC	70 - 130	20
% Bromofluorobenzene	104	%	104	%	102	97	96	97	96	1.0	70 - 130	20

I = This parameter is outside laboratory LCS/LCSD specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference  
LCS - Laboratory Control Sample  
LCSD - Laboratory Control Sample Duplicate  
MS - Matrix Spike  
MS Dup - Matrix Spike Duplicate  
NC - No Criteria  
Intf - Interference

  
Phyllis Shiller, Laboratory Director  
December 10, 2015

# Sample Criteria Exceedences Report

Criteria: None

**GBK33744 - HARPER**

State: VT

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units
--------	-------	-----------------	----------	--------	----	----------	----------------	-------------------

\*\*\* No Data to Display \*\*\*

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.



587 East Middle Turnpike P.O. Box 370, Manchester, CT 06040  
 Telephone: 860.645.1102 • Fax: 860.641.0823

CHAIN OF CUSTODY RECORD

AIR ANALYSES

800-827-5426

email: greg@phoenixlabs.com

P.O. #

Page

of /

Data Delivery:

Fax #:

Email:

Phone #:

CHAPER@SOLAR.VT.NET

Report to: HARPER ENV.  
 Customer: Harper  
 Address: PLIMOUTH VT

Invoice to: Same  
 Sampled by: C. HARPER

Project Name: S. MAIN ST WRS  
 Requested Deliverable: RCP  ASP CAT B   
 MCP  NJ Deliverables   
 State where samples collected: VT

Phoenix ID #	Client Sample ID	THIS SECTION FOR LAB USE ONLY										Soil Gas	Ambient/Indoor Air	MATRIX	Grab (G) Composite (C)	10-14	TO-15	
		Canister ID #	Canister Size (L)	Outgoing Canister Pressure ("Hg)	Incoming Canister Pressure ("Hg)	Flow Regulator ID #	Flow Controller Setting (ml/min)	Sampling Start Time	Sampling End Time	Sample Start Date	Canister Pressure at Start ("Hg)							Canister Pressure at End ("Hg)
33744	V-1	737	1.4	-30	<0	3850	9.72	11:51	2	12/7	29	2	X					
33745	V-2	817	1.4	-30	-0	3219		11:36	159	12/7	29	0	X					
33746	V-3	775	1.4	-30	-0	3178	V	11:47	157	12/7	29	0	X					

Relinquished by: [Signature] Date: 10-8-15  
 Accepted by: [Signature] Date: 10-8-15  
 Time: 10:40

Data Format: Excel  Equis  GISKey   
 PDF  Other:

Requested Criteria: VOC ANALYSES - SPECIFICALLY PCE  
 V-1 BACK  
 V-2 BETWEEN MAGNIES  
 V-3 MIDDLE CF FLR.

Quote Number: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_

I attest that all media released by Phoenix Environmental Laboratories, Inc. have been received in good working condition and agree to the terms and conditions as listed on the back of this document.



V-1

Fmr College Cleaners  
Soil Gas Sampling Dec 2015



V-2

Fmr College Cleaners  
Soil Gas Sampling Dec 2015

V-3

PLEASE RETURN TO:  
PHOENIX ENVIRONMENTAL LABS  
MT WOODS, TOWNSHIPS EAST  
MANCHESTER, CT 06040  
860-333-0044

Small white label with illegible text in the top left corner.

**GEF**

PRESTIGE 322

**COLD JET**

**GEF**

PRESTIGE 322

**COLD JET**

