



October 19, 2021

Mr. Mark Glova
Robinson Construction, Inc.
445 E 200 N
Warsaw, Indiana 46582

**RE: Summary Report – Focused Sub-Slab Vapor Sampling
Commercial/Industrial Property
1624 E Winona Avenue, Indianapolis, Indiana
Patriot Project No. 21-1208-01E**

Dear Mr. Glova:

In accordance with our proposal P21-1065C-01E dated September 24, 2021, Patriot Engineering and Environmental, Inc. (*Patriot*) has prepared this summary report documenting focused sub-slab vapor sampling in the western portion of the building at the commercial/industrial property located at 1624 E Winona Avenue in Warsaw, Indiana (Site). Details of the work performed are presented in the following sections.

BACKGROUND

The Site is located at 1624 East Winona Avenue on the east side of Warsaw, Kosciusko County, Indiana. The Site is owned by Cardinal Services Inc. (Cardinal) and includes a 43,302 square foot building originally constructed in 1947. Based on a review of the historical information, the Site was originally used for glove manufacturing by Jomac and has also been used for storage by the Kosciusko County YMCA, Our Fathers House, and Cardinal.

Patriot completed a Phase I ESA on the property in July 2021 and identified three recognized environmental condition (RECs), specifically:

- **REC-1: Existing USTs at the Property with No Closure Documentation**
- **REC-2: Historic Operations at the Property (Glove Manufacturing)**
- **REC-3: Adjoining Property (Dalton Foundry) – Historic Spills/Releases**

One of the RECs (Dalton Foundry) is an off-Site property located hydraulically upgradient to the Site. The other two RECs relate to historical activities (particularly

glove manufacturing) at the Site, as well as the presence of existing underground storage tanks (USTs) at the Site lacking closure documentation. Any or all of these RECs could potentially have impacted soil and/or groundwater at the Site as well as create a potential vapor intrusion condition (VEC) for current or future structures.

To address these RECs, a Phase II LSI was performed to evaluate whether any of the RECs have impacted soil and/or groundwater at the Site. The results of the Phase II LSI identified the chlorinated volatile organic compound (cVOC) trichloroethene (TCE), in groundwater at a concentration above commercial/industrial IDEM vapor migration from groundwater screening levels (VIGWSLs) in a boring immediately north of the western part of the building. Consequently, since periodic occupation of the building is planned, Patriot recommended performing sub-slab vapor sampling below the western portion of the building to determine whether there is the potential for vapor intrusion to occur.

FIELD WORK

Sub-Slab Vapor Sampling

To evaluate whether TCE is present in sub-slab vapors, a sub-slab sample was collected from the basement in the western portion of the building. A sub-slab sampling port was installed in the basement floor on the north side of the western part of the building on October 1, 2021. The sub-slab port consisted of a Cox-Colvin Vapor Pin™ that is designed to lie essentially flush on the upper surface of the concrete floor. Following installation, the sub-slab port was subjected to water-bath testing to ensure a good seal.

After an equilibration period of approximately four days, a sub-slab sampling event was performed on October 5, 2021. The sub-slab sample was obtained from the new port using a 1-liter polished stainless-steel SUMMA® canister with a calibrated flow controller that was cleaned, certified, and evacuated prior to sampling. The flow controller was calibrated for a sampling duration of 5-10 minutes (100-200 milliliters per minute). The sub-slab sample was collected by assembling a short (≈ 30 cm) length of ¼-inch diameter tubing that connected directly to the sub-slab port and the sampling canister. The valve was then opened to collect the sample. At the completion of sample collection, the canister was closed and sealed with an air-tight brass cap. A field data sheet documenting the sampling times/vacuums is included in Attachment 1.

At the completion of the sampling event, the canister was shipped to Pace Analytical National Center for Testing & Innovation (Pace National) in Nashville, Tennessee, using standard quality assurance/quality control (QA/QC) procedures and chain-of-custody protocols. The sample was analyzed for cVOCs in accordance with USEPA Compendium Method TO-15.

RESULTS

The analytical results are summarized in Table 1 and a copy of the laboratory report is included as Attachment 2. The results indicated that various individual VOCs, including the cVOC tetrachloroethene (PCE) which is a common dry-cleaning solvent and a “parent” product for TCE, were detected in the sub-slab sample; however, all of the detected concentrations were below their respective IDEM VIGWSLs. In addition, none of the four compounds detected in the nearby groundwater sample (TCE, 1,1-dichloroethene, cis-1,2-dichloroethene, and vinyl chloride) were present in the sub-slab sample at concentrations above their respective laboratory detection limits.

CONCLUSIONS AND RECOMMENDATIONS

Based on these data, there is currently no complete pathway for vapor intrusion at the Site since the sub-slab vapor impacts are below applicable IDEM screening levels. Since conditions could change once the building is occupied and utilized on a regular basis, we recommend re-sampling the sub-slab port under “normal” operating conditions following building occupation, and also collecting a paired indoor air sample in the work area at the same time to verify that unacceptable vapor intrusion is not occurring at the Site.

We appreciate the opportunity to assist you with this project. If you have questions or need additional information, please contact me at ssittler@patrioteng.com or at (574) 876-9835.

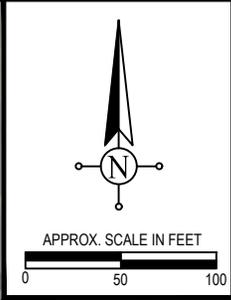
Very truly yours,
Patriot Engineering and Environmental, Inc.



Steven P. Sittler, P.G.
Senior Project Manager

Attachments

FIGURES



Patriot Engineering &
Environmental, Inc.

LEGEND

 Site Boundary

NOTES:

1. Image Source: Google Earth
2. Scale as shown.

Project: Robertson Construction Phase 1 ESA
1624 East Winona Avenue
Warsaw, Indiana

Project Number: 21-0961-01	Drawn By: J. DuMond
Date: June 29, 2021	Approved: S. Dombrowski
	DWG: 21-0961-01_Ph1

Figure 1

Aerial Site Map

TABLES

Table 2
Summary of Sub-Slab Vapor Sampling Results (ug/m³)
Cardinal Building
1624 E Winona Avenue, Warsaw, Indiana
Patriot Project No. 21-1208-01E

Sample ID	Sample Location	Sample Type	Date Sampled	Acetone	Benzene	Carbon Tetrachloride	Cyclohexane	Dichlorodifluoromethane	Ethanol	Ethylbenzene	4-Ethyltoluene	n-Heptane	n-Hexane	Methylene Chloride	2-Propanol (Isopropanol)	Tetrachloroethene (PCE)	Toluene	1,1,1-Trichloroethane	Trichlorotrifluoromethane	1,2,4-Trimethylbenzene	Xylenes
SS-1	Basement - West Building Area	Sub-Slab	10/05/21	14.2	1.08	1.49	1.70	2.28	89.7	1.87	1.47	5.73	5.64	50.7	3.98	1,180	4.56	3.89	7.59	2.65	5.90
RCG Sub-Slab Vapor Exposure Screening Level (Residential) ^{1,2}				1,066,667	3.6	156.7	33,333	3,333	NL	366.7	NL	NL	24,333	21,000	7,000	1,400	173,333	173,333	NL	2,100	3,333
RCG Sub-Slab Vapor Exposure Screening Level (Commercial/Industrial) ^{1,2}				4,666,667	533	666.7	866,667	14,667	NL	1,633	NL	NL	103,333	86,667	29,333	6,000	733,333	733,333	NL	1,033	14,667

Notes:

Samples analyzed using EPA Method TO-15

NL = No Screening Levels Available for Compound

NA = Not Analyzed for this compound

ug/m³ = microgram per cubic meter

VOC = Volatile Organic Compound

(1) Indiana Department of Environmental Management Remediation Closure Guide, March 22, 2013 with updates through 2021

(2) Sub-slab screening levels obtained by applying an attenuation factor of 0.03 to the IDEM Remediation Closure Guide indoor air screening levels (March 22, 2013 with updates through 2021)

Individual compounds listed only if detected in at least one sample

Bold = Compound present above laboratory detection limits

Green Bold - concentration exceeds RCG Sub-Slab Vapor Exposure Screening Level (Residential)

Yellow Bold - concentration exceeds RCG Sub-Slab Vapor Exposure Screening Level (Com/Ind)

ATTACHMENT 1
VI Sampling Field Data Sheet

ATTACHMENT 2

Laboratory Report



Patriot Engineering - Indy

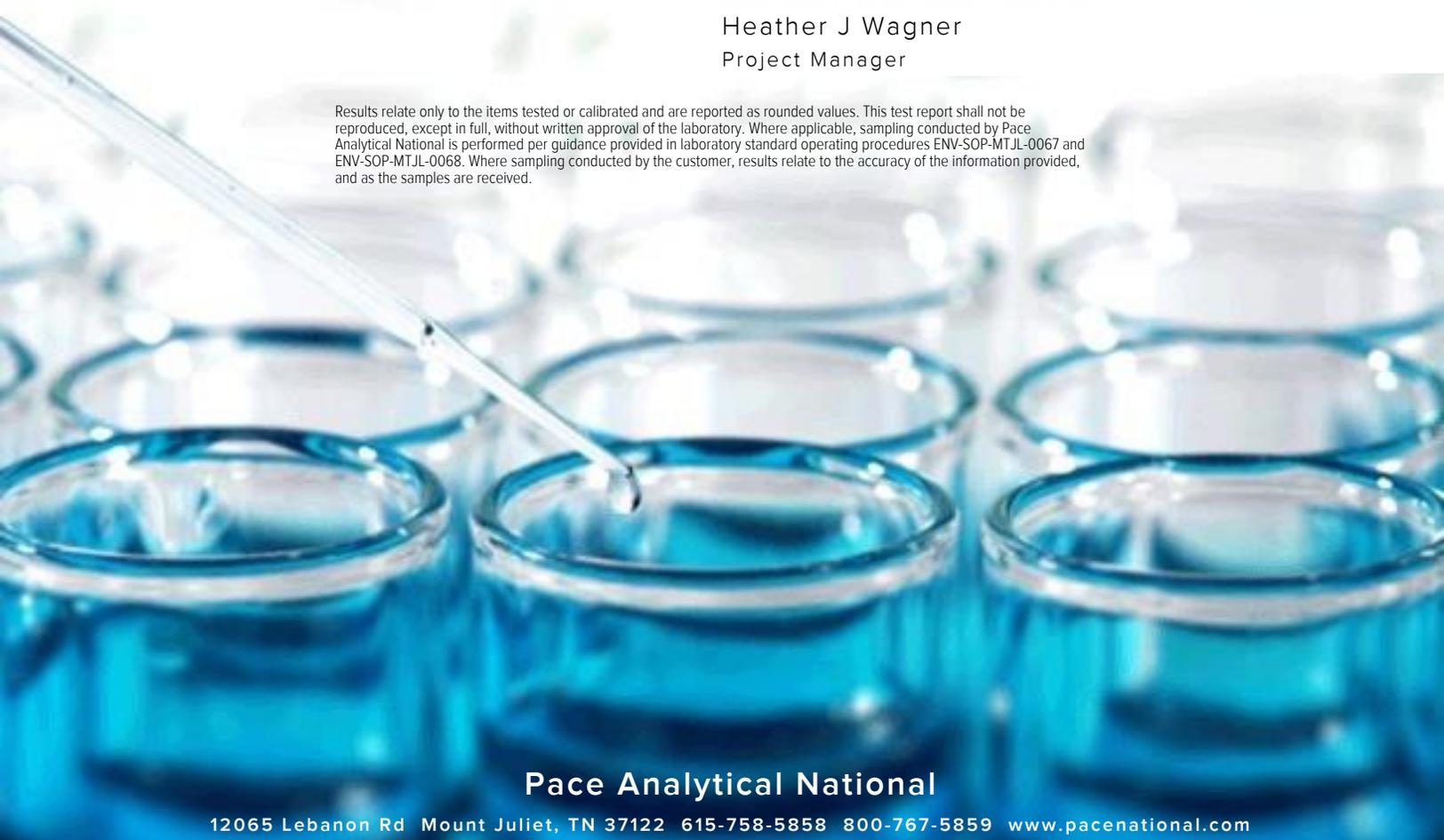
Sample Delivery Group: L1414257
Samples Received: 10/06/2021
Project Number: 21-1208-01E
Description: Robinson Construction
Site: WARSAW, IN
Report To: Steve Sittler
6150 East 75th St
Indianapolis, IN 46250

Entire Report Reviewed By:



Heather J Wagner
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



Pace Analytical National

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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SAMPLE SUMMARY

SS-1 L1414257-01 Air

Collected by: Steve Sittler
 Collected date/time: 10/05/21 09:21
 Received date/time: 10/06/21 09:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1753797	1	10/08/21 14:40	10/08/21 14:40	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1754242	10	10/09/21 14:22	10/09/21 14:22	CAW	Mt. Juliet, TN

- ¹Cp
- ²Tc
- ³Ss
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- ⁵Sr
- ⁶Qc
- ⁷Gl
- ⁸Al
- ⁹Sc

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Heather J Wagner
Project Manager

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	5.97	14.2		1	WG1753797
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1753797
Benzene	71-43-2	78.10	0.200	0.639	0.337	1.08		1	WG1753797
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1753797
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1753797
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1753797
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1753797
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1753797
Carbon disulfide	75-15-0	76.10	0.200	0.622	ND	ND		1	WG1753797
Carbon tetrachloride	56-23-5	154	0.200	1.26	0.237	1.49		1	WG1753797
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1753797
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1753797
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1753797
Chloromethane	74-87-3	50.50	0.200	0.413	ND	ND		1	WG1753797
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1753797
Cyclohexane	110-82-7	84.20	0.200	0.689	0.493	1.70		1	WG1753797
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1753797
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1753797
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1753797
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1753797
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1753797
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1753797
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1753797
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1753797
cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND		1	WG1753797
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND		1	WG1753797
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND		1	WG1753797
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND		1	WG1753797
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND		1	WG1753797
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND		1	WG1753797
Ethanol	64-17-5	46.10	1.25	2.36	47.6	89.7		1	WG1753797
Ethylbenzene	100-41-4	106	0.200	0.867	0.432	1.87		1	WG1753797
4-Ethyltoluene	622-96-8	120	0.200	0.982	0.299	1.47		1	WG1753797
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	1.35	7.59		1	WG1753797
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.461	2.28		1	WG1753797
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND		1	WG1753797
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND		1	WG1753797
Heptane	142-82-5	100	0.200	0.818	1.40	5.73		1	WG1753797
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND		1	WG1753797
n-Hexane	110-54-3	86.20	0.630	2.22	1.60	5.64		1	WG1753797
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND		1	WG1753797
Methylene Chloride	75-09-2	84.90	0.200	0.694	14.6	50.7		1	WG1753797
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND		1	WG1753797
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	ND	ND		1	WG1753797
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND		1	WG1753797
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND		1	WG1753797
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND		1	WG1753797
Naphthalene	91-20-3	128	0.630	3.30	ND	ND		1	WG1753797
2-Propanol	67-63-0	60.10	1.25	3.07	1.62	3.98		1	WG1753797
Propene	115-07-1	42.10	1.25	2.15	ND	ND		1	WG1753797
Styrene	100-42-5	104	0.200	0.851	ND	ND		1	WG1753797
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND		1	WG1753797
Tetrachloroethylene	127-18-4	166	2.00	13.6	174	1180		10	WG1754242
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND		1	WG1753797
Toluene	108-88-3	92.10	0.500	1.88	1.21	4.56		1	WG1753797
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND		1	WG1753797

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	0.716	3.89		1	WG1753797
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1753797
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1753797
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.539	2.65		1	WG1753797
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1753797
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1753797
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1753797
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1753797
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1753797
m&p-Xylene	1330-20-7	106	0.400	1.73	0.894	3.88		1	WG1753797
o-Xylene	95-47-6	106	0.200	0.867	0.467	2.02		1	WG1753797
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		89.5				WG1753797
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		96.2				WG1754242

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3714326-3 10/08/21 10:22

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv
Acetone	U		0.584	1.25
Allyl Chloride	U		0.114	0.200
Benzene	U		0.0715	0.200
Benzyl Chloride	0.0970	U	0.0598	0.200
Bromodichloromethane	U		0.0702	0.200
Bromoform	U		0.0732	0.600
Bromomethane	U		0.0982	0.200
1,3-Butadiene	U		0.104	2.00
Carbon disulfide	U		0.102	0.200
Carbon tetrachloride	U		0.0732	0.200
Chlorobenzene	U		0.0832	0.200
Chloroethane	U		0.0996	0.200
Chloroform	U		0.0717	0.200
Chloromethane	U		0.103	0.200
2-Chlorotoluene	U		0.0828	0.200
Cyclohexane	U		0.0753	0.200
Dibromochloromethane	U		0.0727	0.200
1,2-Dibromoethane	U		0.0721	0.200
1,2-Dichlorobenzene	U		0.128	0.200
1,3-Dichlorobenzene	U		0.182	0.200
1,4-Dichlorobenzene	0.100	U	0.0557	0.200
1,2-Dichloroethane	U		0.0700	0.200
1,1-Dichloroethane	U		0.0723	0.200
1,1-Dichloroethene	U		0.0762	0.200
cis-1,2-Dichloroethene	U		0.0784	0.200
trans-1,2-Dichloroethene	U		0.0673	0.200
1,2-Dichloropropane	U		0.0760	0.200
cis-1,3-Dichloropropene	U		0.0689	0.200
trans-1,3-Dichloropropene	U		0.0728	0.200
1,4-Dioxane	U		0.0833	0.200
Ethylbenzene	U		0.0835	0.200
4-Ethyltoluene	U		0.0783	0.200
Trichlorofluoromethane	U		0.0819	0.200
Dichlorodifluoromethane	U		0.137	0.200
1,1,2-Trichlorotrifluoroethane	U		0.0793	0.200
1,2-Dichlorotetrafluoroethane	U		0.0890	0.200
Heptane	U		0.104	0.200
Hexachloro-1,3-butadiene	U		0.105	0.630
n-Hexane	U		0.206	0.630
Isopropylbenzene	U		0.0777	0.200

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3714326-3 10/08/21 10:22

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ppbv		ppbv	ppbv
Methylene Chloride	U		0.0979	0.200
Methyl Butyl Ketone	U		0.133	1.25
2-Butanone (MEK)	U		0.0814	1.25
4-Methyl-2-pentanone (MIBK)	U		0.0765	1.25
Methyl Methacrylate	U		0.0876	0.200
MTBE	U		0.0647	0.200
Naphthalene	U		0.350	0.630
2-Propanol	U		0.264	1.25
Propene	0.433	U	0.0932	1.25
Styrene	U		0.0788	0.200
1,1,2,2-Tetrachloroethane	U		0.0743	0.200
Tetrahydrofuran	U		0.0734	0.200
Toluene	U		0.0870	0.500
1,2,4-Trichlorobenzene	U		0.148	0.630
1,1,1-Trichloroethane	U		0.0736	0.200
1,1,2-Trichloroethane	U		0.0775	0.200
Trichloroethylene	U		0.0680	0.200
1,2,4-Trimethylbenzene	U		0.0764	0.200
1,3,5-Trimethylbenzene	U		0.0779	0.200
2,2,4-Trimethylpentane	U		0.133	0.200
Vinyl chloride	U		0.0949	0.200
Vinyl Bromide	U		0.0852	0.200
Vinyl acetate	U		0.116	0.200
m&p-Xylene	U		0.135	0.400
o-Xylene	U		0.0828	0.200
Ethanol	U		0.265	1.25
(S) 1,4-Bromofluorobenzene	89.0			60.0-140

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3714326-1 10/08/21 08:56 • (LCSD) R3714326-2 10/08/21 09:39

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ppbv	ppbv	ppbv	%	%	%			%	%
Ethanol	3.75	4.04	4.18	108	111	55.0-148			3.41	25
Propene	3.75	3.82	3.82	102	102	64.0-144			0.000	25
Dichlorodifluoromethane	3.75	3.67	3.57	97.9	95.2	64.0-139			2.76	25
1,2-Dichlorotetrafluoroethane	3.75	3.83	3.83	102	102	70.0-130			0.000	25
Chloromethane	3.75	3.89	3.85	104	103	70.0-130			1.03	25
Vinyl chloride	3.75	4.14	4.19	110	112	70.0-130			1.20	25

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3714326-1 10/08/21 08:56 • (LCSD) R3714326-2 10/08/21 09:39

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
1,3-Butadiene	3.75	4.01	4.02	107	107	70.0-130			0.249	25
Bromomethane	3.75	3.95	3.93	105	105	70.0-130			0.508	25
Chloroethane	3.75	4.11	3.96	110	106	70.0-130			3.72	25
Trichlorofluoromethane	3.75	3.80	3.75	101	100	70.0-130			1.32	25
1,1,2-Trichlorotrifluoroethane	3.75	3.81	3.81	102	102	70.0-130			0.000	25
1,1-Dichloroethene	3.75	3.92	3.93	105	105	70.0-130			0.255	25
1,1-Dichloroethane	3.75	3.92	3.90	105	104	70.0-130			0.512	25
Acetone	3.75	3.78	3.73	101	99.5	70.0-130			1.33	25
2-Propanol	3.75	3.77	3.81	101	102	70.0-139			1.06	25
Carbon disulfide	3.75	3.60	3.58	96.0	95.5	70.0-130			0.557	25
Methylene Chloride	3.75	3.97	3.99	106	106	70.0-130			0.503	25
MTBE	3.75	3.74	3.76	99.7	100	70.0-130			0.533	25
trans-1,2-Dichloroethene	3.75	3.89	3.91	104	104	70.0-130			0.513	25
n-Hexane	3.75	3.89	3.85	104	103	70.0-130			1.03	25
Vinyl acetate	3.75	3.98	3.78	106	101	70.0-130			5.15	25
Methyl Ethyl Ketone	3.75	3.79	3.85	101	103	70.0-130			1.57	25
cis-1,2-Dichloroethene	3.75	3.84	3.88	102	103	70.0-130			1.04	25
Chloroform	3.75	3.72	3.73	99.2	99.5	70.0-130			0.268	25
Cyclohexane	3.75	3.70	3.73	98.7	99.5	70.0-130			0.808	25
1,1,1-Trichloroethane	3.75	3.62	3.54	96.5	94.4	70.0-130			2.23	25
Carbon tetrachloride	3.75	3.49	3.45	93.1	92.0	70.0-130			1.15	25
Benzene	3.75	3.91	3.92	104	105	70.0-130			0.255	25
1,2-Dichloroethane	3.75	3.76	3.70	100	98.7	70.0-130			1.61	25
Heptane	3.75	4.05	3.92	108	105	70.0-130			3.26	25
Trichloroethylene	3.75	3.81	3.87	102	103	70.0-130			1.56	25
1,2-Dichloropropane	3.75	3.99	4.04	106	108	70.0-130			1.25	25
1,4-Dioxane	3.75	3.42	3.46	91.2	92.3	70.0-140			1.16	25
Bromodichloromethane	3.75	3.89	3.86	104	103	70.0-130			0.774	25
cis-1,3-Dichloropropene	3.75	3.85	3.79	103	101	70.0-130			1.57	25
4-Methyl-2-pentanone (MIBK)	3.75	4.03	4.07	107	109	70.0-139			0.988	25
Toluene	3.75	3.75	3.63	100	96.8	70.0-130			3.25	25
trans-1,3-Dichloropropene	3.75	3.80	3.78	101	101	70.0-130			0.528	25
1,1,2-Trichloroethane	3.75	3.89	3.84	104	102	70.0-130			1.29	25
Methyl Butyl Ketone	3.75	3.96	3.92	106	105	70.0-149			1.02	25
Dibromochloromethane	3.75	3.74	3.71	99.7	98.9	70.0-130			0.805	25
1,2-Dibromoethane	3.75	3.77	3.82	101	102	70.0-130			1.32	25
Chlorobenzene	3.75	3.84	3.78	102	101	70.0-130			1.57	25
Ethylbenzene	3.75	3.67	3.65	97.9	97.3	70.0-130			0.546	25
m&p-Xylene	7.50	7.27	7.15	96.9	95.3	70.0-130			1.66	25
o-Xylene	3.75	3.66	3.64	97.6	97.1	70.0-130			0.548	25

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3714326-1 10/08/21 08:56 • (LCSD) R3714326-2 10/08/21 09:39

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	<u>LCS Qualifier</u>	<u>LCSD Qualifier</u>	RPD %	RPD Limits %
Styrene	3.75	3.77	3.74	101	99.7	70.0-130			0.799	25
Bromoform	3.75	3.56	3.51	94.9	93.6	70.0-130			1.41	25
1,1,2,2-Tetrachloroethane	3.75	3.77	3.83	101	102	70.0-130			1.58	25
4-Ethyltoluene	3.75	3.55	3.51	94.7	93.6	70.0-130			1.13	25
1,3,5-Trimethylbenzene	3.75	3.72	3.61	99.2	96.3	70.0-130			3.00	25
1,2,4-Trimethylbenzene	3.75	3.58	3.57	95.5	95.2	70.0-130			0.280	25
1,3-Dichlorobenzene	3.75	3.71	3.64	98.9	97.1	70.0-130			1.90	25
1,4-Dichlorobenzene	3.75	3.75	3.73	100	99.5	70.0-130			0.535	25
Benzyl Chloride	3.75	3.85	3.81	103	102	70.0-152			1.04	25
1,2-Dichlorobenzene	3.75	3.65	3.61	97.3	96.3	70.0-130			1.10	25
1,2,4-Trichlorobenzene	3.75	3.40	3.42	90.7	91.2	70.0-160			0.587	25
Hexachloro-1,3-butadiene	3.75	3.73	3.76	99.5	100	70.0-151			0.801	25
Naphthalene	3.75	3.50	3.50	93.3	93.3	70.0-159			0.000	25
Allyl Chloride	3.75	3.96	4.07	106	109	70.0-130			2.74	25
2-Chlorotoluene	3.75	3.52	3.48	93.9	92.8	70.0-130			1.14	25
Methyl Methacrylate	3.75	4.07	3.86	109	103	70.0-130			5.30	25
Tetrahydrofuran	3.75	3.93	3.81	105	102	70.0-137			3.10	25
2,2,4-Trimethylpentane	3.75	3.89	3.87	104	103	70.0-130			0.515	25
Vinyl Bromide	3.75	3.83	3.83	102	102	70.0-130			0.000	25
Isopropylbenzene	3.75	3.67	3.67	97.9	97.9	70.0-130			0.000	25
<i>(S) 1,4-Bromofluorobenzene</i>				93.6	91.3	60.0-140				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

Method Blank (MB)

(MB) R3714494-3 10/09/21 08:33

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ppbv		ppbv	ppbv
Tetrachloroethylene	U		0.0814	0.200
<i>(S) 1,4-Bromofluorobenzene</i>	94.2			60.0-140

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3714494-1 10/09/21 07:12 • (LCSD) R3714494-2 10/09/21 07:53

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ppbv	ppbv	ppbv	%	%	%			%	%
Tetrachloroethylene	3.75	4.29	4.20	114	112	70.0-130			2.12	25
<i>(S) 1,4-Bromofluorobenzene</i>				98.1	97.8	60.0-140				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

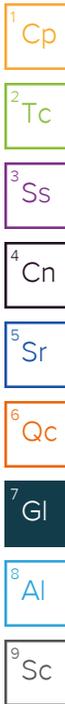
Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
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ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky ^{1,6}	KY90010	South Carolina	84004002
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1,4}	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas ⁵	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

