

From: Mark Davidson <mdavidson@msa-ps.com>
Sent: Thursday, February 1, 2024 8:43 AM
To: Neitzel, Grant D - DNR
Subject: 902/904 Belknap Indoor air results and tables
Attachments: 17711000 Vapor Analytical Results 081121.pdf; 17711000 2021 Letter Report Tables.xlsx

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Grant,
Here is the laboratory analytical report for the sub-slab sampling conducted by MSA in 2021 and a table of the results from the investigation. Please let me know if you have any questions.
Thanks,
Mark



Mark Davidson, PG | Senior Project Hydrogeologist

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MSA Professional Services

Sample Delivery Group: L1390795
Samples Received: 08/14/2021
Project Number: 17711000
Description: 902-904 Belknap Street
Site: SUPERIOR, WI
Report To: Erica Klingfus
332 W. Superior Street, Suite 600
Duluth, MN 55802

Entire Report Reviewed By:



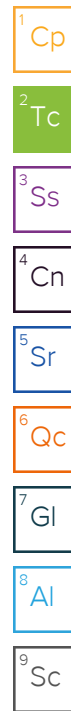
John Hawkins
Project Manager

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 National12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

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SAMPLE SUMMARY

SS-1 L1390795-01 Air

Collected by: Mark Davidson
 Collected date/time: 08/11/21 14:05
 Received date/time: 08/14/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1723970	1	08/16/21 12:52	08/16/21 12:52	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1724486	100	08/17/21 13:54	08/17/21 13:54	FKG	Mt. Juliet, TN

1 Cp

2 Tc

3 Ss

SS-2 L1390795-02 Air

Collected by: Mark Davidson
 Collected date/time: 08/11/21 14:05
 Received date/time: 08/14/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1723970	1	08/16/21 13:32	08/16/21 13:32	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1724486	100	08/17/21 14:35	08/17/21 14:35	FKG	Mt. Juliet, TN

4 Cn

5 Sr

6 Qc

SS-3 L1390795-03 Air

Collected by: Mark Davidson
 Collected date/time: 08/11/21 14:05
 Received date/time: 08/14/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1723970	1	08/16/21 14:13	08/16/21 14:13	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1724486	50	08/17/21 15:16	08/17/21 15:16	FKG	Mt. Juliet, TN

7 Gl

8 Al

9 Sc

SS-4 L1390795-04 Air

Collected by: Mark Davidson
 Collected date/time: 08/11/21 14:05
 Received date/time: 08/14/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1723970	20	08/16/21 14:53	08/16/21 14:53	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1724486	20	08/17/21 12:33	08/17/21 12:33	FKG	Mt. Juliet, TN

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.



John Hawkins
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	1.95	4.63	5.05	12.0		1	WG1723970
Allyl chloride	107-05-1	76.53	0.380	1.19	ND	ND		1	WG1723970
Benzene	71-43-2	78.10	0.238	0.760	0.487	1.56		1	WG1723970
Benzyl Chloride	100-44-7	127	0.199	1.03	ND	ND		1	WG1723970
Bromodichloromethane	75-27-4	164	0.234	1.57	0.382	2.56		1	WG1723970
Bromoform	75-25-2	253	0.244	2.52	ND	ND		1	WG1723970
Bromomethane	74-83-9	94.90	0.327	1.27	ND	ND		1	WG1723970
1,3-Butadiene	106-99-0	54.10	0.347	0.768	ND	ND		1	WG1723970
Carbon disulfide	75-15-0	76.10	0.340	1.06	ND	ND		1	WG1723970
Carbon tetrachloride	56-23-5	154	0.244	1.54	ND	ND		1	WG1723970
Chlorobenzene	108-90-7	113	0.277	1.28	ND	ND		1	WG1723970
Chloroethane	75-00-3	64.50	0.332	0.876	ND	ND		1	WG1723970
Chloroform	67-66-3	119	0.239	1.16	5.25	25.6		1	WG1723970
Chloromethane	74-87-3	50.50	0.343	0.708	ND	ND		1	WG1723970
2-Chlorotoluene	95-49-8	126	0.276	1.42	ND	ND		1	WG1723970
Cyclohexane	110-82-7	84.20	0.251	0.864	ND	ND		1	WG1723970
Dibromochloromethane	124-48-1	208	0.242	2.06	ND	ND		1	WG1723970
1,2-Dibromoethane	106-93-4	188	0.240	1.85	ND	ND		1	WG1723970
1,2-Dichlorobenzene	95-50-1	147	0.427	2.57	ND	ND		1	WG1723970
1,3-Dichlorobenzene	541-73-1	147	0.607	3.65	ND	ND		1	WG1723970
1,4-Dichlorobenzene	106-46-7	147	0.186	1.12	ND	ND		1	WG1723970
1,2-Dichloroethane	107-06-2	99	0.233	0.943	ND	ND		1	WG1723970
1,1-Dichloroethane	75-34-3	98	0.241	0.966	ND	ND		1	WG1723970
1,1-Dichloroethene	75-35-4	96.90	0.254	1.01	0.370	1.47		1	WG1723970
cis-1,2-Dichloroethene	156-59-2	96.90	26.1	103	229	908		100	WG1724486
trans-1,2-Dichloroethene	156-60-5	96.90	0.224	0.888	0.289	1.15		1	WG1723970
1,2-Dichloropropane	78-87-5	113	0.253	1.17	ND	ND		1	WG1723970
cis-1,3-Dichloropropene	10061-01-5	111	0.230	1.04	ND	ND		1	WG1723970
trans-1,3-Dichloropropene	10061-02-6	111	0.243	1.10	ND	ND		1	WG1723970
1,4-Dioxane	123-91-1	88.10	0.278	1.00	ND	ND		1	WG1723970
Ethanol	64-17-5	46.10	0.883	1.66	3.23	6.09		1	WG1723970
Ethylbenzene	100-41-4	106	0.278	1.21	ND	ND		1	WG1723970
4-Ethyltoluene	622-96-8	120	0.261	1.28	ND	ND		1	WG1723970
Trichlorofluoromethane	75-69-4	137.40	0.273	1.53	ND	ND		1	WG1723970
Dichlorodifluoromethane	75-71-8	120.92	0.457	2.26	0.691	3.42		1	WG1723970
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.264	2.02	ND	ND		1	WG1723970
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.297	2.08	ND	ND		1	WG1723970
Heptane	142-82-5	100	0.347	1.42	ND	ND		1	WG1723970
Hexachloro-1,3-butadiene	87-68-3	261	0.350	3.74	ND	ND		1	WG1723970
n-Hexane	110-54-3	86.20	0.687	2.42	ND	ND		1	WG1723970
Isopropylbenzene	98-82-8	120.20	0.259	1.27	ND	ND		1	WG1723970
Methylene Chloride	75-09-2	84.90	0.326	1.13	ND	ND		1	WG1723970
Methyl Butyl Ketone	591-78-6	100	0.443	1.81	ND	ND		1	WG1723970
2-Butanone (MEK)	78-93-3	72.10	0.271	0.799	ND	ND		1	WG1723970
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	0.255	1.04	ND	ND		1	WG1723970
Methyl methacrylate	80-62-6	100.12	0.292	1.20	ND	ND		1	WG1723970
MTBE	1634-04-4	88.10	0.216	0.778	ND	ND		1	WG1723970
Naphthalene	91-20-3	128	1.17	6.13	ND	ND		1	WG1723970
2-Propanol	67-63-0	60.10	0.880	2.16	ND	ND		1	WG1723970
Propene	115-07-1	42.10	0.311	0.536	ND	ND		1	WG1723970
Styrene	100-42-5	104	0.263	1.12	ND	ND		1	WG1723970
1,1,2,2-Tetrachloroethane	79-34-5	168	0.248	1.70	ND	ND		1	WG1723970
Tetrachloroethylene	127-18-4	166	27.1	184	2010	13600		100	WG1724486
Tetrahydrofuran	109-99-9	72.10	0.245	0.722	ND	ND		1	WG1723970
Toluene	108-88-3	92.10	0.290	1.09	ND	ND		1	WG1723970
1,2,4-Trichlorobenzene	120-82-1	181	0.493	3.65	ND	ND		1	WG1723970

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	0.245	1.33	ND	ND		1	WG1723970
1,1,2-Trichloroethane	79-00-5	133	0.258	1.40	ND	ND		1	WG1723970
Trichloroethylene	79-01-6	131	22.7	122	355	1900		100	WG1724486
1,2,4-Trimethylbenzene	95-63-6	120	0.255	1.25	ND	ND		1	WG1723970
1,3,5-Trimethylbenzene	108-67-8	120	0.260	1.28	ND	ND		1	WG1723970
2,2,4-Trimethylpentane	540-84-1	114.22	0.443	2.07	ND	ND		1	WG1723970
Vinyl chloride	75-01-4	62.50	0.316	0.808	ND	ND		1	WG1723970
Vinyl Bromide	593-60-2	106.95	0.284	1.24	ND	ND		1	WG1723970
Vinyl acetate	108-05-4	86.10	0.387	1.36	ND	ND		1	WG1723970
m&p-Xylene	1330-20-7	106	0.450	1.95	ND	ND		1	WG1723970
o-Xylene	95-47-6	106	0.276	1.20	ND	ND		1	WG1723970
1,1-Difluoroethane	75-37-6	66.05	0.430	1.16	ND	ND		1	WG1723970
1,2,3-Trimethylbenzene	526-73-8	120.10	0.268	1.32	ND	ND		1	WG1723970
Chlorodifluoromethane	75-45-6	86.50	0.437	1.55	ND	ND		1	WG1723970
Ethyl Acetate	141-78-6	88	0.333	1.20	ND	ND		1	WG1723970
Methyl Cyclohexane	108-87-2	98.1860	0.271	1.09	ND	ND		1	WG1723970
Tert-Amyl Ethyl Ether	919-94-8	116.20	0.259	1.23	ND	ND		1	WG1723970
TPH (GC/MS) Low Fraction	8006-61-9	101	132	545	1160	4790		1	WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		97.9				WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		89.0				WG1724486

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 - TENTATIVELY IDENTIFIED COMPOUNDS

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch	RT
Unknown-01	007782-79-8	43	0.000	0.000	75.7	133	JN	1	WG1723970	3.78

Tentatively Identified compounds (TIC) refers to substances not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search routine of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist. Quantitation is accomplished by relative peak area of the TIC compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is 10% or more of that of the nearest internal standard.

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	1.95	4.63	23.3	55.4		1	WG1723970
Allyl chloride	107-05-1	76.53	0.380	1.19	ND	ND		1	WG1723970
Benzene	71-43-2	78.10	0.238	0.760	1.07	3.42		1	WG1723970
Benzyl Chloride	100-44-7	127	0.199	1.03	ND	ND		1	WG1723970
Bromodichloromethane	75-27-4	164	0.234	1.57	ND	ND		1	WG1723970
Bromoform	75-25-2	253	0.244	2.52	ND	ND		1	WG1723970
Bromomethane	74-83-9	94.90	0.327	1.27	ND	ND		1	WG1723970
1,3-Butadiene	106-99-0	54.10	0.347	0.768	ND	ND		1	WG1723970
Carbon disulfide	75-15-0	76.10	0.340	1.06	0.420	1.31		1	WG1723970
Carbon tetrachloride	56-23-5	154	0.244	1.54	ND	ND		1	WG1723970
Chlorobenzene	108-90-7	113	0.277	1.28	ND	ND		1	WG1723970
Chloroethane	75-00-3	64.50	0.332	0.876	ND	ND		1	WG1723970
Chloroform	67-66-3	119	0.239	1.16	1.01	4.92		1	WG1723970
Chloromethane	74-87-3	50.50	0.343	0.708	ND	ND		1	WG1723970
2-Chlorotoluene	95-49-8	126	0.276	1.42	ND	ND		1	WG1723970
Cyclohexane	110-82-7	84.20	0.251	0.864	ND	ND		1	WG1723970
Dibromochloromethane	124-48-1	208	0.242	2.06	ND	ND		1	WG1723970
1,2-Dibromoethane	106-93-4	188	0.240	1.85	ND	ND		1	WG1723970
1,2-Dichlorobenzene	95-50-1	147	0.427	2.57	ND	ND		1	WG1723970
1,3-Dichlorobenzene	541-73-1	147	0.607	3.65	ND	ND		1	WG1723970
1,4-Dichlorobenzene	106-46-7	147	0.186	1.12	ND	ND		1	WG1723970
1,2-Dichloroethane	107-06-2	99	0.233	0.943	ND	ND		1	WG1723970
1,1-Dichloroethane	75-34-3	98	0.241	0.966	ND	ND		1	WG1723970
1,1-Dichloroethene	75-35-4	96.90	0.254	1.01	22.9	90.8		1	WG1723970
cis-1,2-Dichloroethene	156-59-2	96.90	26.1	103	5400	21400		100	WG1724486
trans-1,2-Dichloroethene	156-60-5	96.90	0.224	0.888	88.6	351		1	WG1723970
1,2-Dichloropropane	78-87-5	113	0.253	1.17	ND	ND		1	WG1723970
cis-1,3-Dichloropropene	10061-01-5	111	0.230	1.04	ND	ND		1	WG1723970
trans-1,3-Dichloropropene	10061-02-6	111	0.243	1.10	ND	ND		1	WG1723970
1,4-Dioxane	123-91-1	88.10	0.278	1.00	1.12	4.04		1	WG1723970
Ethanol	64-17-5	46.10	0.883	1.66	14.8	27.9		1	WG1723970
Ethylbenzene	100-41-4	106	0.278	1.21	ND	ND		1	WG1723970
4-Ethyltoluene	622-96-8	120	0.261	1.28	ND	ND		1	WG1723970
Trichlorofluoromethane	75-69-4	137.40	0.273	1.53	0.330	1.85		1	WG1723970
Dichlorodifluoromethane	75-71-8	120.92	0.457	2.26	0.460	2.27		1	WG1723970
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.264	2.02	ND	ND		1	WG1723970
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.297	2.08	ND	ND		1	WG1723970
Heptane	142-82-5	100	0.347	1.42	ND	ND		1	WG1723970
Hexachloro-1,3-butadiene	87-68-3	261	0.350	3.74	ND	ND		1	WG1723970
n-Hexane	110-54-3	86.20	0.687	2.42	ND	ND		1	WG1723970
Isopropylbenzene	98-82-8	120.20	0.259	1.27	ND	ND		1	WG1723970
Methylene Chloride	75-09-2	84.90	0.326	1.13	0.567	1.97		1	WG1723970
Methyl Butyl Ketone	591-78-6	100	0.443	1.81	ND	ND		1	WG1723970
2-Butanone (MEK)	78-93-3	72.10	0.271	0.799	ND	ND		1	WG1723970
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	0.255	1.04	ND	ND		1	WG1723970
Methyl methacrylate	80-62-6	100.12	0.292	1.20	ND	ND		1	WG1723970
MTBE	1634-04-4	88.10	0.216	0.778	ND	ND		1	WG1723970
Naphthalene	91-20-3	128	1.17	6.13	ND	ND		1	WG1723970
2-Propanol	67-63-0	60.10	0.880	2.16	ND	ND		1	WG1723970
Propene	115-07-1	42.10	0.311	0.536	ND	ND		1	WG1723970
Styrene	100-42-5	104	0.263	1.12	ND	ND		1	WG1723970
1,1,2,2-Tetrachloroethane	79-34-5	168	0.248	1.70	ND	ND		1	WG1723970
Tetrachloroethylene	127-18-4	166	27.1	184	9110	61900		100	WG1724486
Tetrahydrofuran	109-99-9	72.10	0.245	0.722	ND	ND		1	WG1723970
Toluene	108-88-3	92.10	0.290	1.09	0.346	1.30		1	WG1723970
1,2,4-Trichlorobenzene	120-82-1	181	0.493	3.65	ND	ND		1	WG1723970

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

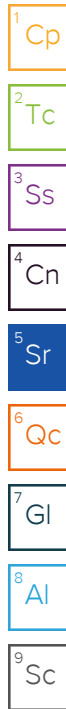
7 Gl

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	0.245	1.33	ND	ND		1	WG1723970
1,1,2-Trichloroethane	79-00-5	133	0.258	1.40	ND	ND		1	WG1723970
Trichloroethylene	79-01-6	131	22.7	122	1460	7820		100	WG1724486
1,2,4-Trimethylbenzene	95-63-6	120	0.255	1.25	ND	ND		1	WG1723970
1,3,5-Trimethylbenzene	108-67-8	120	0.260	1.28	ND	ND		1	WG1723970
2,2,4-Trimethylpentane	540-84-1	114.22	0.443	2.07	ND	ND		1	WG1723970
Vinyl chloride	75-01-4	62.50	0.316	0.808	11.0	28.1		1	WG1723970
Vinyl Bromide	593-60-2	106.95	0.284	1.24	ND	ND		1	WG1723970
Vinyl acetate	108-05-4	86.10	0.387	1.36	ND	ND		1	WG1723970
m&p-Xylene	1330-20-7	106	0.450	1.95	ND	ND		1	WG1723970
o-Xylene	95-47-6	106	0.276	1.20	ND	ND		1	WG1723970
1,1-Difluoroethane	75-37-6	66.05	43.0	116	683	1850		100	WG1724486
1,2,3-Trimethylbenzene	526-73-8	120.10	0.268	1.32	ND	ND		1	WG1723970
Chlorodifluoromethane	75-45-6	86.50	0.437	1.55	ND	ND		1	WG1723970
Ethyl Acetate	141-78-6	88	0.333	1.20	ND	ND		1	WG1723970
Methyl Cyclohexane	108-87-2	98.1860	0.271	1.09	ND	ND		1	WG1723970
Tert-Amyl Ethyl Ether	919-94-8	116.20	0.259	1.23	ND	ND		1	WG1723970
TPH (GC/MS) Low Fraction	8006-61-9	101	132	545	2180	9010		1	WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		100				WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		88.6				WG1724486



Volatile Organic Compounds (MS) by Method TO-15 - TENTATIVELY IDENTIFIED COMPOUNDS

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch	RT
Tetrachloroethylene	000127-18-4	164	0.000	0.000	60.0	402	J N	1	WG1723970	10.51
Unknown-01	000811-97-2	102	0.000	0.000	39.2	164	J N	1	WG1723970	3.91

Tentatively Identified compounds (TIC) refers to substances not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search routine of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist. Quantitation is accomplished by relative peak area of the TIC compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is 10% or more of that of the nearest internal standard.

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	1.95	4.63	14.5	34.5		1	WG1723970
Allyl chloride	107-05-1	76.53	0.380	1.19	ND	ND		1	WG1723970
Benzene	71-43-2	78.10	0.238	0.760	ND	ND		1	WG1723970
Benzyl Chloride	100-44-7	127	0.199	1.03	ND	ND		1	WG1723970
Bromodichloromethane	75-27-4	164	0.234	1.57	0.645	4.33		1	WG1723970
Bromoform	75-25-2	253	0.244	2.52	ND	ND		1	WG1723970
Bromomethane	74-83-9	94.90	0.327	1.27	ND	ND		1	WG1723970
1,3-Butadiene	106-99-0	54.10	0.347	0.768	ND	ND		1	WG1723970
Carbon disulfide	75-15-0	76.10	0.340	1.06	ND	ND		1	WG1723970
Carbon tetrachloride	56-23-5	154	0.244	1.54	ND	ND		1	WG1723970
Chlorobenzene	108-90-7	113	0.277	1.28	ND	ND		1	WG1723970
Chloroethane	75-00-3	64.50	0.332	0.876	ND	ND		1	WG1723970
Chloroform	67-66-3	119	0.239	1.16	8.04	39.1		1	WG1723970
Chloromethane	74-87-3	50.50	0.343	0.708	ND	ND		1	WG1723970
2-Chlorotoluene	95-49-8	126	0.276	1.42	ND	ND		1	WG1723970
Cyclohexane	110-82-7	84.20	0.251	0.864	ND	ND		1	WG1723970
Dibromochloromethane	124-48-1	208	0.242	2.06	ND	ND		1	WG1723970
1,2-Dibromoethane	106-93-4	188	0.240	1.85	ND	ND		1	WG1723970
1,2-Dichlorobenzene	95-50-1	147	0.427	2.57	ND	ND		1	WG1723970
1,3-Dichlorobenzene	541-73-1	147	0.607	3.65	ND	ND		1	WG1723970
1,4-Dichlorobenzene	106-46-7	147	0.186	1.12	ND	ND		1	WG1723970
1,2-Dichloroethane	107-06-2	99	0.233	0.943	ND	ND		1	WG1723970
1,1-Dichloroethane	75-34-3	98	0.241	0.966	ND	ND		1	WG1723970
1,1-Dichloroethene	75-35-4	96.90	0.254	1.01	0.542	2.15		1	WG1723970
cis-1,2-Dichloroethene	156-59-2	96.90	13.1	51.9	340	1350		50	WG1724486
trans-1,2-Dichloroethene	156-60-5	96.90	0.224	0.888	1.96	7.77		1	WG1723970
1,2-Dichloropropane	78-87-5	113	0.253	1.17	ND	ND		1	WG1723970
cis-1,3-Dichloropropene	10061-01-5	111	0.230	1.04	ND	ND		1	WG1723970
trans-1,3-Dichloropropene	10061-02-6	111	0.243	1.10	ND	ND		1	WG1723970
1,4-Dioxane	123-91-1	88.10	0.278	1.00	ND	ND		1	WG1723970
Ethanol	64-17-5	46.10	0.883	1.66	4.32	8.15		1	WG1723970
Ethylbenzene	100-41-4	106	0.278	1.21	ND	ND		1	WG1723970
4-Ethyltoluene	622-96-8	120	0.261	1.28	ND	ND		1	WG1723970
Trichlorofluoromethane	75-69-4	137.40	0.273	1.53	ND	ND		1	WG1723970
Dichlorodifluoromethane	75-71-8	120.92	0.457	2.26	0.747	3.69		1	WG1723970
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.264	2.02	ND	ND		1	WG1723970
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.297	2.08	ND	ND		1	WG1723970
Heptane	142-82-5	100	0.347	1.42	ND	ND		1	WG1723970
Hexachloro-1,3-butadiene	87-68-3	261	0.350	3.74	ND	ND		1	WG1723970
n-Hexane	110-54-3	86.20	0.687	2.42	ND	ND		1	WG1723970
Isopropylbenzene	98-82-8	120.20	0.259	1.27	ND	ND		1	WG1723970
Methylene Chloride	75-09-2	84.90	0.326	1.13	ND	ND		1	WG1723970
Methyl Butyl Ketone	591-78-6	100	0.443	1.81	ND	ND		1	WG1723970
2-Butanone (MEK)	78-93-3	72.10	0.271	0.799	ND	ND		1	WG1723970
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	0.255	1.04	ND	ND		1	WG1723970
Methyl methacrylate	80-62-6	100.12	0.292	1.20	ND	ND		1	WG1723970
MTBE	1634-04-4	88.10	0.216	0.778	ND	ND		1	WG1723970
Naphthalene	91-20-3	128	1.17	6.13	ND	ND		1	WG1723970
2-Propanol	67-63-0	60.10	0.880	2.16	ND	ND		1	WG1723970
Propene	115-07-1	42.10	0.311	0.536	ND	ND		1	WG1723970
Styrene	100-42-5	104	0.263	1.12	ND	ND		1	WG1723970
1,1,2,2-Tetrachloroethane	79-34-5	168	0.248	1.70	ND	ND		1	WG1723970
Tetrachloroethylene	127-18-4	166	13.6	92.3	881	5980		50	WG1724486
Tetrahydrofuran	109-99-9	72.10	0.245	0.722	ND	ND		1	WG1723970
Toluene	108-88-3	92.10	0.290	1.09	ND	ND		1	WG1723970
1,2,4-Trichlorobenzene	120-82-1	181	0.493	3.65	ND	ND		1	WG1723970

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	0.245	1.33	ND	ND		1	WG1723970
1,1,2-Trichloroethane	79-00-5	133	0.258	1.40	ND	ND		1	WG1723970
Trichloroethylene	79-01-6	131	11.3	60.5	244	1310		50	WG1724486
1,2,4-Trimethylbenzene	95-63-6	120	0.255	1.25	ND	ND		1	WG1723970
1,3,5-Trimethylbenzene	108-67-8	120	0.260	1.28	ND	ND		1	WG1723970
2,2,4-Trimethylpentane	540-84-1	114.22	0.443	2.07	ND	ND		1	WG1723970
Vinyl chloride	75-01-4	62.50	0.316	0.808	2.47	6.31		1	WG1723970
Vinyl Bromide	593-60-2	106.95	0.284	1.24	ND	ND		1	WG1723970
Vinyl acetate	108-05-4	86.10	0.387	1.36	ND	ND		1	WG1723970
m&p-Xylene	1330-20-7	106	0.450	1.95	ND	ND		1	WG1723970
o-Xylene	95-47-6	106	0.276	1.20	ND	ND		1	WG1723970
1,1-Difluoroethane	75-37-6	66.05	0.430	1.16	16.6	44.8		1	WG1723970
1,2,3-Trimethylbenzene	526-73-8	120.10	0.268	1.32	ND	ND		1	WG1723970
Chlorodifluoromethane	75-45-6	86.50	0.437	1.55	ND	ND		1	WG1723970
Ethyl Acetate	141-78-6	88	0.333	1.20	ND	ND		1	WG1723970
Methyl Cyclohexane	108-87-2	98.1860	0.271	1.09	ND	ND		1	WG1723970
Tert-Amyl Ethyl Ether	919-94-8	116.20	0.259	1.23	ND	ND		1	WG1723970
TPH (GC/MS) Low Fraction	8006-61-9	101	132	545	1300	5370		1	WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		98.8				WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		88.9				WG1724486

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 - TENTATIVELY IDENTIFIED COMPOUNDS

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch	RT
Unknown-01	007782-79-8	43	0.000	0.000	47.6	83.7	JN	1	WG1723970	3.79

Tentatively Identified compounds (TIC) refers to substances not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search routine of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist. Quantitation is accomplished by relative peak area of the TIC compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is 10% or more of that of the nearest internal standard.

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	39.0	92.7	43.9	104		20	WG1723970
Allyl chloride	107-05-1	76.53	7.60	23.8	ND	ND		20	WG1723970
Benzene	71-43-2	78.10	4.77	15.2	ND	ND		20	WG1723970
Benzyl Chloride	100-44-7	127	4.00	20.8	ND	ND		20	WG1723970
Bromodichloromethane	75-27-4	164	4.67	31.3	ND	ND		20	WG1723970
Bromoform	75-25-2	253	4.87	50.4	ND	ND		20	WG1723970
Bromomethane	74-83-9	94.90	6.53	25.3	ND	ND		20	WG1723970
1,3-Butadiene	106-99-0	54.10	6.93	15.3	ND	ND		20	WG1723970
Carbon disulfide	75-15-0	76.10	6.80	21.2	ND	ND		20	WG1723970
Carbon tetrachloride	56-23-5	154	4.87	30.7	ND	ND		20	WG1723970
Chlorobenzene	108-90-7	113	5.53	25.6	ND	ND		20	WG1723970
Chloroethane	75-00-3	64.50	6.63	17.5	ND	ND		20	WG1723970
Chloroform	67-66-3	119	4.77	23.2	ND	ND		20	WG1723970
Chloromethane	74-87-3	50.50	6.87	14.2	ND	ND		20	WG1723970
2-Chlorotoluene	95-49-8	126	5.53	28.5	ND	ND		20	WG1723970
Cyclohexane	110-82-7	84.20	5.03	17.3	ND	ND		20	WG1723970
Dibromochloromethane	124-48-1	208	4.83	41.1	ND	ND		20	WG1723970
1,2-Dibromoethane	106-93-4	188	4.80	36.9	ND	ND		20	WG1723970
1,2-Dichlorobenzene	95-50-1	147	8.53	51.3	ND	ND		20	WG1723970
1,3-Dichlorobenzene	541-73-1	147	12.1	72.7	ND	ND		20	WG1723970
1,4-Dichlorobenzene	106-46-7	147	3.70	22.2	ND	ND		20	WG1723970
1,2-Dichloroethane	107-06-2	99	4.67	18.9	ND	ND		20	WG1723970
1,1-Dichloroethane	75-34-3	98	4.83	19.4	ND	ND		20	WG1723970
1,1-Dichloroethene	75-35-4	96.90	5.07	20.1	ND	ND		20	WG1723970
cis-1,2-Dichloroethene	156-59-2	96.90	5.23	20.7	8.81	34.9		20	WG1724486
trans-1,2-Dichloroethene	156-60-5	96.90	4.50	17.8	ND	ND		20	WG1723970
1,2-Dichloropropane	78-87-5	113	5.07	23.4	ND	ND		20	WG1723970
cis-1,3-Dichloropropene	10061-01-5	111	4.60	20.9	ND	ND		20	WG1723970
trans-1,3-Dichloropropene	10061-02-6	111	4.87	22.1	ND	ND		20	WG1723970
1,4-Dioxane	123-91-1	88.10	5.57	20.1	ND	ND		20	WG1723970
Ethanol	64-17-5	46.10	17.7	33.4	36.1	68.1		20	WG1723970
Ethylbenzene	100-41-4	106	5.57	24.1	ND	ND		20	WG1723970
4-Ethyltoluene	622-96-8	120	5.23	25.7	ND	ND		20	WG1723970
Trichlorofluoromethane	75-69-4	137.40	5.47	30.7	ND	ND		20	WG1723970
Dichlorodifluoromethane	75-71-8	120.92	9.13	45.2	ND	ND		20	WG1723970
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	5.30	40.6	ND	ND		20	WG1723970
1,2-Dichlorotetrafluoroethane	76-14-2	171	5.93	41.5	ND	ND		20	WG1723970
Heptane	142-82-5	100	6.93	28.3	ND	ND		20	WG1723970
Hexachloro-1,3-butadiene	87-68-3	261	7.00	74.7	ND	ND		20	WG1723970
n-Hexane	110-54-3	86.20	13.7	48.3	ND	ND		20	WG1723970
Isopropylbenzene	98-82-8	120.20	5.17	25.4	ND	ND		20	WG1723970
Methylene Chloride	75-09-2	84.90	6.53	22.7	ND	ND		20	WG1723970
Methyl Butyl Ketone	591-78-6	100	8.87	36.3	ND	ND		20	WG1723970
2-Butanone (MEK)	78-93-3	72.10	5.43	16.0	ND	ND		20	WG1723970
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	5.10	20.9	ND	ND		20	WG1723970
Methyl methacrylate	80-62-6	100.12	5.83	23.9	ND	ND		20	WG1723970
MTBE	1634-04-4	88.10	4.30	15.5	ND	ND		20	WG1723970
Naphthalene	91-20-3	128	23.3	122	ND	ND		20	WG1723970
2-Propanol	67-63-0	60.10	17.6	43.3	ND	ND		20	WG1723970
Propene	115-07-1	42.10	6.20	10.7	ND	ND		20	WG1723970
Styrene	100-42-5	104	5.27	22.4	ND	ND		20	WG1723970
1,1,2,2-Tetrachloroethane	79-34-5	168	4.97	34.1	ND	ND		20	WG1723970
Tetrachloroethylene	127-18-4	166	5.43	36.9	56.4	383		20	WG1724486
Tetrahydrofuran	109-99-9	72.10	4.90	14.4	ND	ND		20	WG1723970
Toluene	108-88-3	92.10	5.80	21.8	6.28	23.7		20	WG1723970
1,2,4-Trichlorobenzene	120-82-1	181	9.87	73.1	ND	ND		20	WG1723970

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	4.90	26.7	ND	ND		20	WG1723970
1,1,2-Trichloroethane	79-00-5	133	5.17	28.1	ND	ND		20	WG1723970
Trichloroethylene	79-01-6	131	4.53	24.3	10.1	54.1		20	WG1724486
1,2,4-Trimethylbenzene	95-63-6	120	5.10	25.0	ND	ND		20	WG1723970
1,3,5-Trimethylbenzene	108-67-8	120	5.20	25.5	ND	ND		20	WG1723970
2,2,4-Trimethylpentane	540-84-1	114.22	8.87	41.4	ND	ND		20	WG1723970
Vinyl chloride	75-01-4	62.50	6.33	16.2	ND	ND		20	WG1723970
Vinyl Bromide	593-60-2	106.95	5.67	24.8	ND	ND		20	WG1723970
Vinyl acetate	108-05-4	86.10	7.73	27.2	ND	ND		20	WG1723970
m&p-Xylene	1330-20-7	106	9.00	39.0	ND	ND		20	WG1723970
o-Xylene	95-47-6	106	5.53	24.0	ND	ND		20	WG1723970
1,1-Difluoroethane	75-37-6	66.05	8.60	23.2	119	321		20	WG1723970
1,2,3-Trimethylbenzene	526-73-8	120.10	5.37	26.4	ND	ND		20	WG1723970
Chlorodifluoromethane	75-45-6	86.50	8.73	30.9	15.4	54.5		20	WG1723970
Ethyl Acetate	141-78-6	88	6.67	24.0	ND	ND		20	WG1723970
Methyl Cyclohexane	108-87-2	98.1860	5.43	21.8	ND	ND		20	WG1723970
Tert-Amyl Ethyl Ether	919-94-8	116.20	5.20	24.7	ND	ND		20	WG1723970
TPH (GC/MS) Low Fraction	8006-61-9	101	2650	10900	ND	ND		20	WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		97.6				WG1723970
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		85.4				WG1724486

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 - TENTATIVELY IDENTIFIED COMPOUNDS

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch	RT
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Number of TICs found: 0

Tentatively Identified compounds (TIC) refers to substances not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search routine of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist. Quantitation is accomplished by relative peak area of the TIC compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is 10% or more of that of the nearest internal standard.

Method Blank (MB)

(MB) R3692778-3 08/16/21 09:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ppbv		ppbv	ppbv
Acetone	U		0.584	1.95
Allyl Chloride	U		0.114	0.380
Benzene	U		0.0715	0.238
Benzyl Chloride	U		0.0598	0.199
Bromodichloromethane	U		0.0702	0.234
Bromoform	U		0.0732	0.244
Bromomethane	U		0.0982	0.327
1,3-Butadiene	U		0.104	0.347
Carbon disulfide	U		0.102	0.340
Carbon tetrachloride	U		0.0732	0.244
Chlorobenzene	U		0.0832	0.277
Chloroethane	U		0.0996	0.332
Chloroform	U		0.0717	0.239
Chloromethane	U		0.103	0.343
2-Chlorotoluene	U		0.0828	0.276
Cyclohexane	U		0.0753	0.251
Dibromochloromethane	U		0.0727	0.242
1,2-Dibromoethane	U		0.0721	0.240
1,2-Dichlorobenzene	U		0.128	0.427
1,3-Dichlorobenzene	U		0.182	0.607
1,4-Dichlorobenzene	U		0.0557	0.186
1,2-Dichloroethane	U		0.0700	0.233
1,1-Dichloroethane	U		0.0723	0.241
1,1-Dichloroethene	U		0.0762	0.254
trans-1,2-Dichloroethene	U		0.0673	0.224
1,2-Dichloropropane	U		0.0760	0.253
cis-1,3-Dichloropropene	U		0.0689	0.230
trans-1,3-Dichloropropene	U		0.0728	0.243
1,4-Dioxane	U		0.0833	0.278
Ethylbenzene	U		0.0835	0.278
4-Ethyltoluene	U		0.0783	0.261
Trichlorofluoromethane	U		0.0819	0.273
Dichlorodifluoromethane	U		0.137	0.457
1,1,2-Trichlorotrifluoroethane	U		0.0793	0.264
1,2-Dichlorotetrafluoroethane	U		0.0890	0.297
Heptane	U		0.104	0.347
Hexachloro-1,3-butadiene	U		0.105	0.350
n-Hexane	U		0.206	0.687
Isopropylbenzene	U		0.0777	0.259
Methylene Chloride	U		0.0979	0.326

¹Cp

²Tc

³Ss

⁴Cn

⁵Sr

⁶Qc

⁷Gl

⁸Al

⁹Sc

Method Blank (MB)

(MB) R3692778-3 08/16/21 09:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ppbv		ppbv	ppbv
Methyl Butyl Ketone	U		0.133	0.443
2-Butanone (MEK)	U		0.0814	0.271
4-Methyl-2-pentanone (MIBK)	U		0.0765	0.255
Methyl Methacrylate	U		0.0876	0.292
MTBE	U		0.0647	0.216
Naphthalene	U		0.350	1.17
2-Propanol	U		0.264	0.880
Propene	U		0.0932	0.311
Styrene	U		0.0788	0.263
1,1,2,2-Tetrachloroethane	U		0.0743	0.248
Tetrahydrofuran	U		0.0734	0.245
Toluene	U		0.0870	0.290
1,2,4-Trichlorobenzene	U		0.148	0.493
1,1,1-Trichloroethane	U		0.0736	0.245
1,1,2-Trichloroethane	U		0.0775	0.258
1,2,4-Trimethylbenzene	U		0.0764	0.255
1,3,5-Trimethylbenzene	U		0.0779	0.260
2,2,4-Trimethylpentane	U		0.133	0.443
Vinyl chloride	U		0.0949	0.316
Vinyl Bromide	U		0.0852	0.284
Vinyl acetate	U		0.116	0.387
m&p-Xylene	U		0.135	0.450
o-Xylene	U		0.0828	0.276
Ethanol	U		0.265	0.883
TPH (GC/MS) Low Fraction	U		39.7	132
1,1-Difluoroethane	0.304	U	0.129	0.430
1,2,3-Trimethylbenzene	U		0.0805	0.268
Chlorodifluoromethane	U		0.131	0.437
Ethyl acetate	U		0.100	0.333
Methyl Cyclohexane	U		0.0813	0.271
Tert-Amyl Ethyl Ether	U		0.0778	0.259
(S) 1,4-Bromofluorobenzene	96.6			60.0-140

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Method Blank (MB) - TENTATIVELY IDENTIFIED COMPOUNDS

(MB) R3692778-3 08/16/21 09:59

Analyte	MB Result ppbv	MB Qualifier	MB MDL ppbv	MB RDL ppbv	CAS #
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Number of TICs found: 0

Tentatively Identified compounds (TIC) refers to substances not present in the list of target compounds. Therefore, not all TICs are identified and quantitated using individual standards. TIC listings are prepared utilizing a computerized library search routine of electron impact mass spectral data and evaluation of the relevant data by a mass spectral data specialist. Quantitation is accomplished by relative peak area of the TIC compared to that of the nearest internal standard from the total ion chromatogram. TICs are identified and quantitated only if the peak area is 10% or more of that of the nearest internal standard.

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

(LCS) R3692778-1 08/16/21 08:41 • (LCSD) R3692778-2 08/16/21 09:20

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.28	3.36	87.5	89.6	55.0-148			2.41	25
Propene	3.75	3.26	3.32	86.9	88.5	64.0-144			1.82	25
Dichlorodifluoromethane	3.75	3.37	3.45	89.9	92.0	64.0-139			2.35	25
1,2-Dichlorotetrafluoroethane	3.75	3.56	3.60	94.9	96.0	70.0-130			1.12	25
Chloromethane	3.75	3.09	3.30	82.4	88.0	70.0-130			6.57	25
Vinyl chloride	3.75	3.20	3.38	85.3	90.1	70.0-130			5.47	25
1,3-Butadiene	3.75	2.82	2.95	75.2	78.7	70.0-130			4.51	25
Bromomethane	3.75	3.48	3.56	92.8	94.9	70.0-130			2.27	25
Chloroethane	3.75	3.18	3.25	84.8	86.7	70.0-130			2.18	25
Trichlorofluoromethane	3.75	3.24	3.36	86.4	89.6	70.0-130			3.64	25
1,1,2-Trichlorotrifluoroethane	3.75	3.71	3.81	98.9	102	70.0-130			2.66	25
1,1-Dichloroethene	3.75	3.43	3.51	91.5	93.6	70.0-130			2.31	25
1,1-Dichloroethane	3.75	3.41	3.49	90.9	93.1	70.0-130			2.32	25
Acetone	3.75	3.23	3.35	86.1	89.3	70.0-130			3.65	25
2-Propanol	3.75	3.25	3.37	86.7	89.9	70.0-139			3.63	25
Carbon disulfide	3.75	3.52	3.62	93.9	96.5	70.0-130			2.80	25
Methylene Chloride	3.75	3.15	3.24	84.0	86.4	70.0-130			2.82	25
MTBE	3.75	3.69	3.77	98.4	101	70.0-130			2.14	25
trans-1,2-Dichloroethene	3.75	3.48	3.55	92.8	94.7	70.0-130			1.99	25
n-Hexane	3.75	3.64	3.70	97.1	98.7	70.0-130			1.63	25
Vinyl acetate	3.75	3.17	3.18	84.5	84.8	70.0-130			0.315	25
Methyl Ethyl Ketone	3.75	3.67	3.75	97.9	100	70.0-130			2.16	25
Chloroform	3.75	3.43	3.50	91.5	93.3	70.0-130			2.02	25
Cyclohexane	3.75	3.86	3.95	103	105	70.0-130			2.30	25
1,1,1-Trichloroethane	3.75	3.47	3.49	92.5	93.1	70.0-130			0.575	25
Carbon tetrachloride	3.75	3.51	3.57	93.6	95.2	70.0-130			1.69	25
Benzene	3.75	3.63	3.71	96.8	98.9	70.0-130			2.18	25
1,2-Dichloroethane	3.75	3.24	3.34	86.4	89.1	70.0-130			3.04	25
Heptane	3.75	3.47	3.57	92.5	95.2	70.0-130			2.84	25
1,2-Dichloropropane	3.75	3.51	3.61	93.6	96.3	70.0-130			2.81	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) R3692778-1 08/16/21 08:41 • (LCSD) R3692778-2 08/16/21 09:20

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
1,4-Dioxane	3.75	3.91	4.02	104	107	70.0-140			2.77	25
Bromodichloromethane	3.75	3.45	3.55	92.0	94.7	70.0-130			2.86	25
cis-1,3-Dichloropropene	3.75	3.65	3.72	97.3	99.2	70.0-130			1.90	25
4-Methyl-2-pentanone (MIBK)	3.75	3.40	3.49	90.7	93.1	70.0-139			2.61	25
Toluene	3.75	3.82	3.91	102	104	70.0-130			2.33	25
trans-1,3-Dichloropropene	3.75	3.61	3.72	96.3	99.2	70.0-130			3.00	25
1,1,2-Trichloroethane	3.75	3.75	3.83	100	102	70.0-130			2.11	25
Methyl Butyl Ketone	3.75	3.52	3.62	93.9	96.5	70.0-149			2.80	25
Dibromochloromethane	3.75	3.76	3.86	100	103	70.0-130			2.62	25
1,2-Dibromoethane	3.75	3.83	3.93	102	105	70.0-130			2.58	25
Chlorobenzene	3.75	3.87	3.95	103	105	70.0-130			2.05	25
Ethylbenzene	3.75	3.84	3.93	102	105	70.0-130			2.32	25
m&p-Xylene	7.50	7.84	8.00	105	107	70.0-130			2.02	25
o-Xylene	3.75	3.93	4.01	105	107	70.0-130			2.02	25
Styrene	3.75	4.08	4.15	109	111	70.0-130			1.70	25
Bromoform	3.75	3.91	3.96	104	106	70.0-130			1.27	25
1,1,2,2-Tetrachloroethane	3.75	3.69	3.76	98.4	100	70.0-130			1.88	25
4-Ethyltoluene	3.75	4.07	4.11	109	110	70.0-130			0.978	25
1,3,5-Trimethylbenzene	3.75	4.04	4.13	108	110	70.0-130			2.20	25
1,2,4-Trimethylbenzene	3.75	4.13	4.22	110	113	70.0-130			2.16	25
1,3-Dichlorobenzene	3.75	4.09	4.12	109	110	70.0-130			0.731	25
1,4-Dichlorobenzene	3.75	4.13	4.22	110	113	70.0-130			2.16	25
Benzyl Chloride	3.75	3.86	3.93	103	105	70.0-152			1.80	25
1,2-Dichlorobenzene	3.75	4.05	4.14	108	110	70.0-130			2.20	25
1,2,4-Trichlorobenzene	3.75	4.59	4.65	122	124	70.0-160			1.30	25
Hexachloro-1,3-butadiene	3.75	4.08	4.16	109	111	70.0-151			1.94	25
Naphthalene	3.75	4.49	4.55	120	121	70.0-159			1.33	25
TPH (GC/MS) Low Fraction	203	211	215	104	106	70.0-130			1.88	25
Allyl Chloride	3.75	3.43	3.57	91.5	95.2	70.0-130			4.00	25
2-Chlorotoluene	3.75	3.79	3.87	101	103	70.0-130			2.09	25
Methyl Methacrylate	3.75	3.73	3.75	99.5	100	70.0-130			0.535	25
Tetrahydrofuran	3.75	3.28	3.37	87.5	89.9	70.0-137			2.71	25
2,2,4-Trimethylpentane	3.75	3.64	3.71	97.1	98.9	70.0-130			1.90	25
Vinyl Bromide	3.75	3.59	3.71	95.7	98.9	70.0-130			3.29	25
Isopropylbenzene	3.75	4.12	4.16	110	111	70.0-130			0.966	25
1,1-Difluoroethane	3.75	3.48	3.55	92.8	94.7	70.0-130			1.99	25
1,2,3-Trimethylbenzene	3.75	4.05	4.15	108	111	70.0-130			2.44	25
Chlorodifluoromethane	3.75	3.20	3.18	85.3	84.8	70.0-130			0.627	25
Ethyl acetate	3.75	3.28	3.35	87.5	89.3	70.0-130			2.11	25
Methyl Cyclohexane	3.75	3.91	4.01	104	107	70.0-130			2.53	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) R3692778-1 08/16/21 08:41 • (LCSD) R3692778-2 08/16/21 09:20

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 %
Tert-Amyl Ethyl Ether	3.75	3.74	3.83	99.7	102	70.0-130			2.38	25
<i>(S) 1,4-Bromofluorobenzene</i>				97.2	97.2	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) R3693043-3 08/17/21 10:22

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ppbv		ppbv	ppbv
cis-1,2-Dichloroethene	U		0.0784	0.261
Tetrachloroethylene	U		0.0814	0.271
Trichloroethylene	U		0.0680	0.227
1,1-Difluoroethane	0.136	J	0.129	0.430
(S) 1,4-Bromofluorobenzene	92.2			60.0-140

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

(LCS) R3693043-1 08/17/21 08:57 • (LCSD) R3693043-2 08/17/21 09:40

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ppbv	ppbv	ppbv	%	%	%			%	%
cis-1,2-Dichloroethene	3.75	3.97	3.99	106	106	70.0-130			0.503	25
Trichloroethylene	3.75	3.78	3.79	101	101	70.0-130			0.264	25
Tetrachloroethylene	3.75	3.79	3.80	101	101	70.0-130			0.264	25
1,1-Difluoroethane	3.75	3.99	4.01	106	107	70.0-130			0.500	25
(S) 1,4-Bromofluorobenzene				95.5	94.8	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

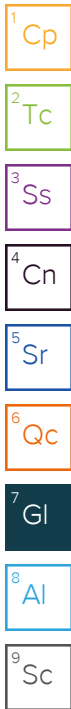
The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

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.
RT	Retention Time.
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.
N	The analyte is tentatively identified and the associated numerical value may not be consistent with the actual concentration present in the sample.



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.

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

Company Name/Address:
MSA Professional Services
 332 W. Superior Street, Suite 600
 Duluth, MN 55802

Billing Information:
MSA Professionals
 332 W. Superior Street, Suite 600
 Duluth, MN 55802

Pres
Chk

Report to:
Erica Klingfus

Email To: mdavidson@msa-ps.com;
eklingfus@msa-ps.com

Project Description:
 902-904 Belknap Street

City/State
 Collected:

Please Circle:
 PT MT CT ET

Phone: **218-722-3915**

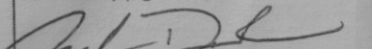
Client Project #
17711000

Lab Project #
MSAPRODMN-17711000

Collected by (print):
Mark Davidson

Site/Facility ID #
SUPERIOR, WI

P.O. #

Collected by (signature):

 Immediately
 Packed on Ice N Y

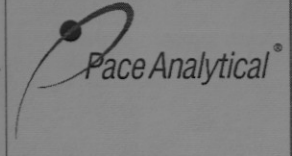
Rush? (Lab MUST Be Notified)
 Same Day Five Day
 Next Day 5 Day (Rad Only)
 Two Day 10 Day (Rad Only)
 Three Day

Quote #
 Date Results Needed

No.
of
Cnts

TO-15TIC Summa

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cnts							
SS-1	G	Air	-	8/11/21	1405	1	X						
SS-2	G	Air	-	↓	1411	1	X						
SS-3	G	Air	-	↓	1445	1	X						
SS-4	G	Air	-	↓	1430	1	X						



12065 Lebanon Rd Mount Juliet, TN 37122
 Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: <https://info.pacelabs.com/hubs/pas-standard-terms.pdf>

SDG # **41390795**
G097

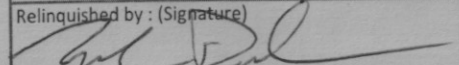
Acctnum: **MSAPRODMN**
 Template: **T186640**
 Prelogin: **P864641**
 PM: **341 - John Hawkins**
 PB: *CSL-08/03h*
 Shipped Via: **FedEX Ground**

* Matrix:
 SS - Soil AIR - Air F - Filter
 GW - Groundwater B - Bioassay
 WW - WasteWater
 DW - Drinking Water
 OT - Other _____

Remarks:
 pH _____ Temp _____
 Flow _____ Other _____

Samples returned via:
 UPS FedEx Courier _____
 Tracking # **9517 5751 1120**

Sample Receipt Checklist
 COC Seal Present/Intact: NP Y N
 COC Signed/Accurate: Y N
 Bottles arrive intact: Y N
 Correct bottles used: Y N
 Sufficient volume sent: Y N
If Applicable
 VOA Zero Headspace: Y N
 Preservation Correct/Checked: Y N
 RAD Screen <0.5 mR/hr: Y N

Relinquished by: (Signature)


Date: **8/13/21**
 Time: **1600**

Received by: (Signature)
 Trip Blank Received: Yes No
 HCL / MeOH
 TBR

Relinquished by: (Signature)

Date:
 Time:

Received by: (Signature)
 Temp: _____ °C
 Bottles Received: **4**

Relinquished by: (Signature)

Date:
 Time:

Received for lab by: (Signature)
B. Blum
 Date: **8-14-21** Time: **0900**

If preservation required by Login: Date/Time
 Hold:
 Condition:
 NCF OK