Environmental Audits
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Twin Disc, Inc.
Annual 2020 Monitoring Results
Broach Machine #2525

Subject Property
Twin Disc, Inc.
4600 21st Street
Racine, WI 53405
FID #252007140
BRRTS: 02-52-000072

July 3, 2020

Prepared by:

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I, Edwin E. Raymond, hereby certify that I am a hydrogeologist as that term is defined under s. NR 712.03(1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

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Preface

Environmental Audits, Inc. (EA) has exercised reasonable efforts to accomplish the required tasks for the **"Twin Disc, Inc. Annual 2020 Monitoring Results"**. EA has employed the professional standards applicable to the environmental consulting field today.

The information required for the **"Twin Disc, Inc. Annual 2020 Monitoring Results"** has been provided to Environmental Audits, Inc. by Twin Disc, Inc. management. This work was accomplished within time and budget limitations. More definitive conclusions may be desired than are warranted by the facts available under these constraints. The conclusions stated in this report are intended for guidance.

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PURPOSE

The purpose of this submittal is to provide an Annual Report or Update per the requirements of s. NR 724.13(e) describing the results of the previous four (4) quarters of groundwater sampling at the Twin Disc, Inc. Plant 3 manufacturing Site. This report summarizes the additional investigation involved with the subsurface contamination resulting from an oil/solvent leak through the Twin Disc, Incorporated Machine #2525 Broach Pit retaining wall. This leakage occurred over an unknown period of time but was first noticed on August 8, 1990.

This report also provides the results obtained from the most recent round of Volatile Organics (VOC), EPA 5030/8021 sampling of the monitoring wells MW-11, MW-13, MW-14, MW-15, MW-17, MW-19, MW-22, MW-23, MW-24, MW-26, and MW-402. Sampling of these wells was conducted June 11, 2020

MW-26 was constructed on June 17, 2019 as a replacement for MW-16. MW-16 was removed from service due to the placement of a new machine and the requisite machine base. Please see Appendix II for a copy of the Monitoring Well Construction Report, Abandonment Report, and Well Development Forms.

The previously submitted documents are incorporated into this document by reference.

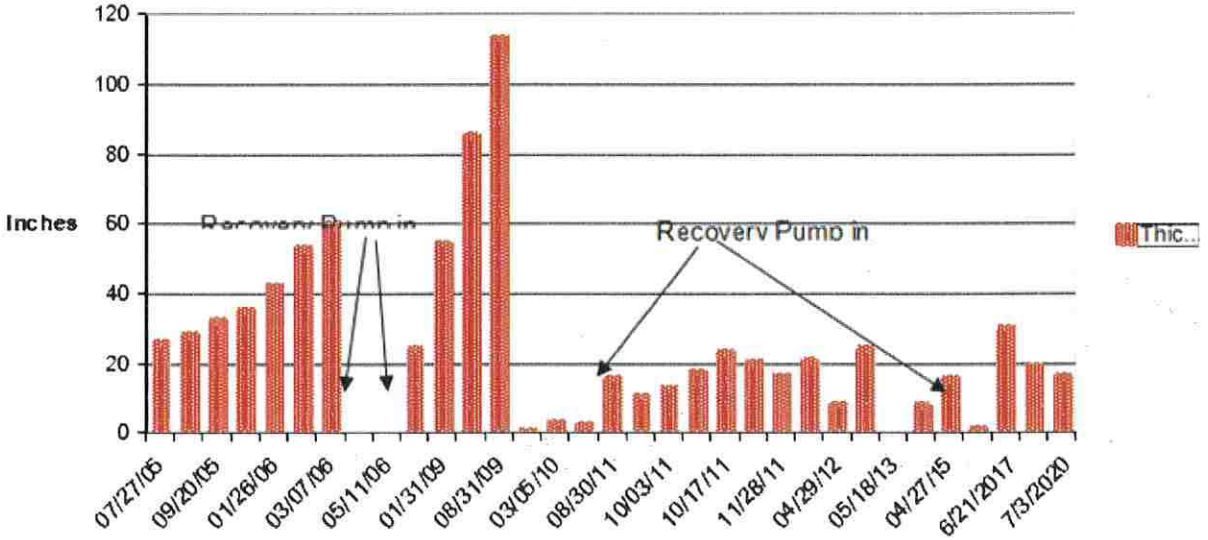
INTRODUCTION

This report deals with the results obtained over the previous year of quarterly analysis performed on the groundwater monitoring wells, commencing during August 2018, for VOC, EPA 8260.

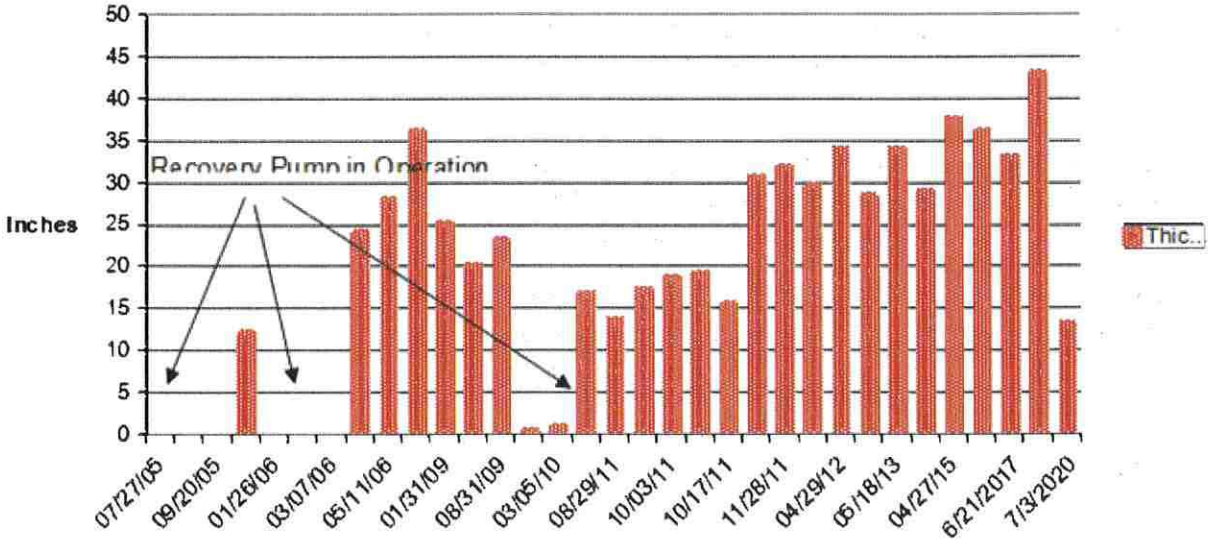
Groundwater monitoring wells were developed in accordance to the procedures detailed in s. NR 141. Groundwater monitoring well samples obtained for laboratory analysis were placed in appropriate pre-weighed sample containers immediately after being collected. Groundwater monitoring well samples were cooled to 4 degrees Celsius by placing the samples in a container and surrounding them with ice. Groundwater monitoring well sample containers were filled to the maximum extent possible to reduce headspace and the possible loss of volatile hydrocarbons. All VOC samples were preserved with a 1:1 addition of hydrochloric acid.

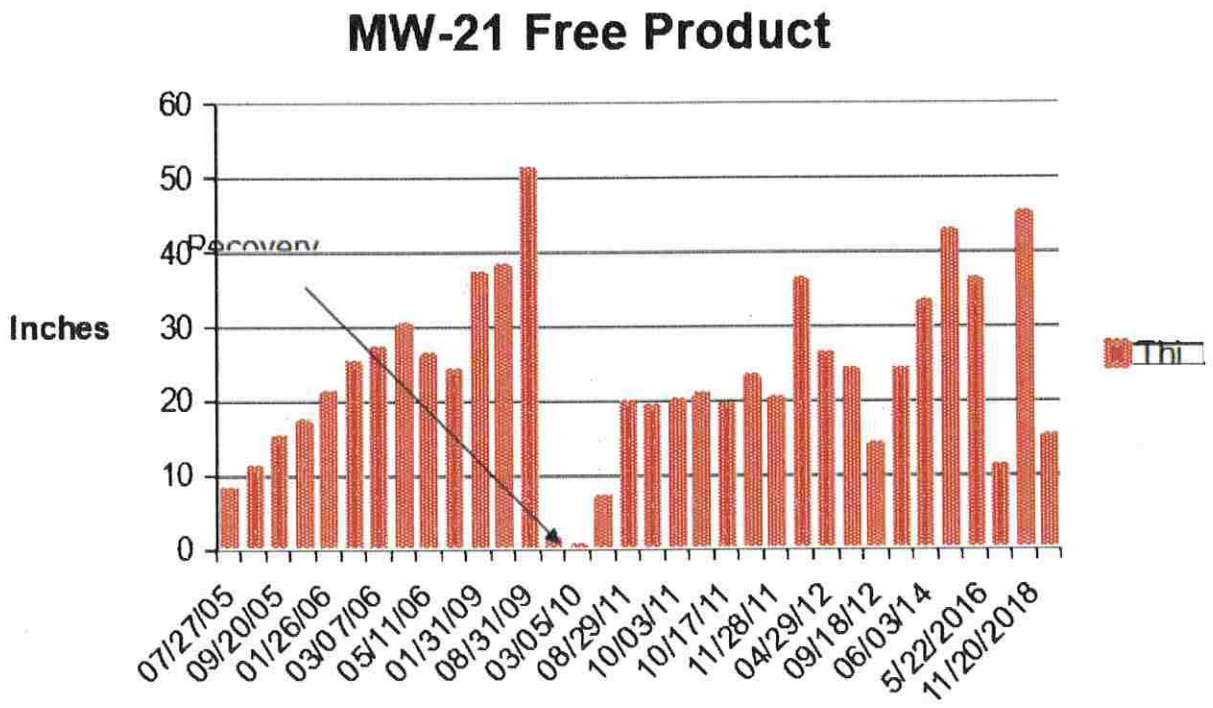
Groundwater monitoring well samples were transported to Pace Analytical Services, Inc., 1241 Bellevue Street - Suite 9, Green Bay, WI 54302, WDNR Certification Number 405132750, under established Chain of Custody procedures and analyzed for VOC, EPA 8260.

MW-18 Free Product



MW-20 Free Product





DRO sampling was discontinued as a regular analytical parameter as of the 2nd Quarter 2016 groundwater analysis.

Pace Analytical Services, Inc., 1241 Bellevue Street - Suite 9, Green Bay, WI 54302, WDNR Certification Number 405132750, analyzed these monitoring well samples for Volatile Organic Compounds, utilizing USEPA Method SW8260B/SW5030A. Sample results exceeding the appropriate s. NR 140 Enforcement Standard (ES) or Preventative Action Limit (PAL) are highlighted. All Petroleum Volatile Organic Compound results are reported in units of ug/l.

Results of these analyses are as follows:

Groundwater Well MW-1

Test Description Method 8260B	Mar-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	0.29 J	<2.5	<2.5	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<3.6	<3.6	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<39.7	<39.7	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<9.7	<9.7	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<1.7	<1.7	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<7.1	<7.1	NS	NS
Chloroethane	8.2	17.1	<13.4	<13.4	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<12.7	<12.7	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<21.9	<21.9	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<26.0	<26.0	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<17.6	<17.6	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<8.3	<8.3	NS	NS
1,1-Dichloroethane	34.4	53.9	45.3	43.6	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<2.8	<2.8	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<2.4	<2.4	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	0.40 J	0.65 J	<2.7	<2.7	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<10.9	<10.9	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<2.8	<2.8	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<2.2	<2.2	700 ug/l	140 ug/l
2-Hexanone	NTF	NTF	NTF	NTF	NS	NS
Methylene Chloride	<0.58	<0.58	<5.8	<5.9	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<12.5	<12.5	60 ug/l	6 ug/l
Styrene	<0.47	<0.47	<4.7	<4.7	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.28	<0.28	<2.8	<2.8	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<3.3	<3.3	5 ug/l	0.5 ug/l
Toluene	<0.27	0.38 J	<1.7	<1.7	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	0.24	1.4	<2.4	<2.4	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<5.5	<5.5	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<2.6	<2.6	5 ug/l	0.5 ug/l
Vinyl Chloride	1.8	3.9	<1.7	**5.3 J**	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<7.3	<7.3	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-2

Test Description Method 8260B	Mar-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<1.2	<1.2	<2.5	<1.2	5 ug/l	0.5 ug/l
Bromodichloromethane	<1.8	<1.8	<3.6	<1.8	0.6 ug/l	0.06 ug/l
Bromoform	<19.9	<19.9	<39.7	<19.9	4.4 ug/l	0.44 ug/l
Bromomethane	<4.9	<4.9	<9.7	<4.9	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.83	<0.83	<1.7	<0.83	5 ug/l	0.5 ug/l
Chlorobenzene	<3.6	<3.6	<7.1	<3.6	NS	NS
Chloroethane	<6.7	7.0 J	<13.4	<6.7	400 ug/l	80 ug/l
Chloroform	<6.4	<6.4	<12.7	<6.4	6 ug/l	0.6 ug/l
Chloromethane	<10.9	<10.9	<21.9	<10.9	3 ug/l	0.3 ug/l
Dibromochloromethane	<13.0	<13.0	<26.0	<13.0	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<18.8	<18.8	<17.6	<18.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<1.4	<1.4	<8.3	<1.4	NS	NS
1,1-Dichloroethane	14.6	15.4	18.2	16.8	850 ug/l	85 ug/l
1,2-Dichloroethane	<1.4	<1.4	<2.8	<1.4	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<1.2	<1.2	<2.4	<1.2	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<1.4	<1.4	<2.7	<1.4	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<5.5	<5.5	<10.9	<5.5	100 ug/l	20 ug/l
1,2-Dichloropropane	<1.4	<1.4	<2.8	<1.4	5 ug/l	0.5 ug/l
Ethyl Benzene	<1.1	<1.1	<2.2	<1.1	700 ug/l	140 ug/l
2-Hexanone	NTF	NTF	NTF	NTF	NS	NS
Methylene Chloride	<2.9	<2.9	<5.8	<2.9	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<6.2	<6.2	<12.5	<6.2	60 ug/l	6 ug/l
Styrene	<2.3	<2.3	<4.7	<2.3	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<1.4	<1.4	<2.8	<1.4	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<1.6	<1.6	<3.3	<1.6	5 ug/l	0.5 ug/l
Toluene	<0.86	<0.86	<1.7	<0.86	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<1.2	<1.2	<2.4	<1.2	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<2.8	<2.8	<5.5	<2.8	5 ug/l	0.5 ug/l
Trichloroethene	<1.3	<1.3	<2.6	<1.3	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.87	<0.87	<1.7	<0.87	0.2 ug/l	0.02 ug/l
Total Xylenes	<3.6	<3.6	<7.3	<3.6	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-6

Test Description Method 8260B	**Mar-20**	**Nov-19**	**Apr-19**	**Nov-18**	**NR 140 ES**	**NR 140 PAL**
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<1.2	<1.2	<2.5	<0.49	5 ug/l	0.5 ug/l
Bromodichloromethane	<1.2	<1.2	<3.6	<0.73	0.6 ug/l	0.06 ug/l
Bromoform	<1.2	<1.2	<39.7	<7.9	4.4 ug/l	0.44 ug/l
Bromomethane	<6.1	<6.1	<9.7	<1.9	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<1.2	<1.2	<1.7	<0.33	5 ug/l	0.5 ug/l
Chlorobenzene	<1.2	<1.2	<7.1	<1.4	NS	NS
Chloroethane	4.2 J	7.8 J	<13.4	<2.7	400 ug/l	80 ug/l
Chloroform	<6.2	<6.2	<12.7	<2.5	6 ug/l	0.6 ug/l
Chloromethane	<1.2	<1.2	<21.9	<4.4	3 ug/l	0.3 ug/l
Dibromochloromethane	<1.2	<1.2	<26.0	<5.2	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<5.4	<5.4	<17.6	<3.5	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.41	<0.41	<8.3	<1.7	NS	NS
1,1-Dichloroethane	93.7	118	79.4	73.2	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.42	<0.42	<2.8	<0.56	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<1.2	<1.2	<2.4	<0.49	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	1.2 J	1.9 J	<2.7	0.93 J	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<0.64	<0.64	<10.9	<2.2	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.58	<0.58	<2.8	<0.56	5 ug/l	0.5 ug/l
Ethyl Benzene	<1.2	<1.2	<2.2	<0.44	700 ug/l	140 ug/l
2-Hexanone	NTF	NTF	NTF	NTF	NS	NS
Methylene Chloride	<0.58	<0.58	<5.8	<1.2	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<0.44	<0.44	<12.5	<2.5	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<4.7	<0.93	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.62	<0.62	<2.8	<0.56	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<1.2	<1.2	<3.3	<0.65	5 ug/l	0.5 ug/l
Toluene	<1.2	<1.2	<1.7	<0.34	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<1.2	<1.2	<2.4	1.6 J	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.39	<0.39	<5.5	<1.1	5 ug/l	0.5 ug/l
Trichloroethene	<0.83	<0.83	<2.6	<0.51	5 ug/l	0.5 ug/l
Vinyl Chloride	**0.93 J**	**1.1 J**	<1.7	**0.39 J**	0.2 ug/l	0.02 ug/l
Total Xylenes	<3.7	<3.7	<7.3	<1.46	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-7

Test Description Method 8260B	Mar-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<4.0	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<0.97	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<1.3	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.83	NS	NS
1,1-Dichloroethane	1.3	1.3	1.9	2.0	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	<0.27	<0.27	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.22	700 ug/l	140 ug/l
2-Hexanone	<0.58	<0.58	<0.58	<0.58	NS	NS
Methylene Chloride	NTF	NTF	NTF	NTF	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	<0.24	0.89 J	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	**1.3**	<0.17	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-9

Test Description Method 8260B	**Mar-20**	**Nov-19**	**Apr-19**	**Nov-18**	**NR 140 ES**	**NR 140 PAL**
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.49	<0.49	<0.49	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.73	<0.73	<0.73	<0.36	0.6 ug/l	0.06 ug/l
Bromoform	<7.9	<7.9	<7.9	<4.0	4.4 ug/l	0.44 ug/l
Bromomethane	<1.9	<1.9	<1.9	<0.97	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.33	<0.33	<0.33	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<1.4	<1.4	<1.4	<0.71	NS	NS
Chloroethane	<1.3	1.8 J	<2.7	<1.3	400 ug/l	80 ug/l
Chloroform	<2.5	<2.5	<2.5	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<4.4	<4.4	<4.4	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<5.2	<5.2	<5.2	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<3.5	<3.5	<3.5	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dichlorobenzene	<0.71	<0.71	<0.71	<0.83	75 ug/l	7.5 ug/l
1,2-Dibromomethane	<1.7	<1.7	<1.7	<0.83	NS	NS
1,1-Dichloroethane	1.6	1.6	1.5	3.9	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.56	<0.56	<0.56	<0.28	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	0.84 J	1.3	0.85 J	0.88 J	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.56	<0.56	<0.56	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.44	<0.44	<0.44	<0.22	700 ug/l	140 ug/l
2-Hexanone	NTF	NTF	NTF	<0.58	NS	NS
Methylene Chloride	<1.2	<1.2	<1.2	NTF	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<2.5	<2.5	<2.5	<1.2	60 ug/l	6 ug/l
Styrene	<0.93	<0.93	<0.93	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.56	<0.56	<0.56	<0.27	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.65	<0.65	<0.65	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.34	<0.34	<0.34	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.49	<0.49	<0.49	0.71 J	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<1.1	<1.1	<1.1	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.51	<0.51	<0.51	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<1.46	<1.46	<1.46	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-10

Test Description Method 8260B	Mar-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.49	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.73	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<7.9	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<1.9	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.33	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<1.4	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<2.7	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<2.5	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<4.4	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<5.2	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<3.5	0.2 ug/l	0.02 ug/l
1,2-Dichlorobenzene	1.6 J	1.4 J	1.2	1.7 J	75 ug/l	7.5 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<1.7	NS	NS
1,1-Dichloroethane	1.6 J	1.5	1.4	1.9 J	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.56	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.49	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.54	0.76 J	4.1	2.0 J	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	3.8 J	4.5	3.0 J	4.5 J	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.56	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.44	700 ug/l	140 ug/l
2-Hexanone	<0.58	<0.58	<0.58	NTF	NS	NS
Methylene Chloride	NTF	NTF	NTF	<1.2	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<2.5	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<0.93	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.56	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	1.4	<0.65	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.34	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	<0.24	<0.49	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<1.1	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.51	5 ug/l	0.5 ug/l
Vinyl Chloride	**142**	**214**	**129**	**212**	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<1.46	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-11

Test Description Method 8260	Jun-20	Jul-19	Feb-19	Aug-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.49	<0.49	<0.62	<0.62	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.73	<0.73	<0.91	<0.91	0.6 ug/l	0.06 ug/l
Bromoform	<7.9	<7.9	<9.9	<9.9	4.4 ug/l	0.44 ug/l
Bromomethane	<1.9	<1.9	<2.4	<2.4	10 ug/l	1 ug/l
Carbon Tetrachloride	<0.33	<0.33	<0.41	<0.41	5 ug/l	0.5 ug/l
Chlorobenzene	<1.4	<1.4	<1.8	<1.8	NS	NS
Chloroethane	<4.4	<4.4	<3.4	<3.4	400 ug/l	80 ug/l
2-Chloroethyl Vinyl Ether	NTF	NTF	NTF	NTF	NS	NS
Chloroform	<2.5	<2.5	<3.2	<3.2	6 ug/l	0.6 ug/l
Chloromethane	<4.4	<4.4	<5.5	<5.5	3 ug/l	0.3 ug/l
Dibromochloromethane	<5.2	<5.2	<6.5	<6.5	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.3	<1.3	<4.4	<4.4	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<1.7	<1.7	<2.1	<2.1	NS	NS
1,1-Dichloroethane	<0.55	40.5	<0.66	<0.66	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.56	<0.56	<2.1	<2.1	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.49	1.2 J	<0.61	<0.61	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	**133**	**143**	**178**	**161**	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	7.2	7.6	13.6	8.1 J	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.57	<0.57	<0.71	<0.71	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.56	<0.56	<0.56	<0.56	700 ug/l	140 ug/l
Methylene Chloride	<1.2	<1.2	<1.5	<1.5	5 ug/l	0.5 ug/l
4-Methyl-2-Pentanone	NTF	NTF	NTF	NTF	500 ug/l	50 ug/l
Methyl-tert-Butylether	<2.5	<2.5	<3.1	<3.1	60 ug/l	6 ug/l
Styrene	<0.93	<0.93	<1.2	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.55	<0.55	<0.67	<0.67	0.2 ug/l	0.02 ug/l
Tetrachloroethene	***2.7***	***2.8***	***4.9***	***4.1***	5 ug/l	0.5 ug/l
Toluene	<0.43	<0.43	<0.43	<0.43	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.49	8.3	<0.61	<0.61	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<1.1	<1.1	<1.4	<1.4	5 ug/l	0.5 ug/l
Trichloroethene	***4.9***	***4.8***	**6.4**	**5.8**	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.35	**2.0**	<0.44	0.47 J	0.2 ug/l	0.02 ug/l
Total Xylenes	<1.45	<1.45	<1.85	<1.85	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-12

Test Description Method 8260	Mar-20	Jul-19	Feb-19	Aug-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<1.2	<2.5	<2.5	<2.5	5 ug/l	0.5 ug/l
Bromodichloromethane	<1.8	<3.6	<3.6	<3.6	0.6 ug/l	0.06 ug/l
Carbon Tetrachloride	<8.2	<1.7	<1.7	<1.7	5 ug/l	0.5 ug/l
Chlorobenzene	<3.6	<7.1	<7.1	<7.1	NS	NS
Chloroethane	<6.7	<13.4	<13.4	<13.4	400 ug/l	80 ug/l
Chloroform	<6.4	<12.7	<12.7	<12.7	6 ug/l	0.6 ug/l
Chloromethane	<10.9	<21.9	<21.9	<21.9	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.5	<26.0	<26.0	<26.0	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<8.8	<17.6	<17.6	<17.6	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<4.1	<8.3	<8.3	<8.3	NS	NS
1,1-Dichloroethane	<1.2	<2.7	<2.7	<2.7	850 ug/l	85 ug/l
1,2-Dichloroethane	<1.4	<2.8	<2.8	<2.8	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<1.2	<2.4	<2.4	<2.4	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<1.4	<0.27	0.48 J	<2.7	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<5.5	<10.9	<10.9	<10.9	100 ug/l	20 ug/l
1,2-Dichloropropane	<1.4	<2.8	<2.8	<2.8	5 ug/l	0.5 ug/l
Ethyl Benzene	<1.6	<2.2	<2.2	<2.2	700 ug/l	140 ug/l
Methylene Chloride	<2.9	<0.58	<0.58	9.4 J	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<6.2	<12.5	<12.5	<12.5	60 ug/l	6 ug/l
1,1,2,2-Tetrachloroethane	<1.4	<2.7	<2.7	<2.7	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<1.8	<3.3	<3.3	<3.3	5 ug/l	0.5 ug/l
Toluene	<1.3	<1.7	<1.7	<1.7	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<1.2	<2.4	<2.4	<2.4	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<2.8	<5.5	<5.5	<5.5	5 ug/l	0.5 ug/l
Trichloroethene	<1.3	<2.6	<2.6	<2.6	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.87	<1.7	<1.7	<1.7	0.2 ug/l	0.02 ug/l
Total Xylenes	<3.6	<7.3	<7.3	<7.3	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-13

Test Description
Method 8021

	Jun-20	Jul-19	Feb-19	Aug-18	NR 140 ES	NR 140 PAL
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroethane	<1.3	1.7 J	<1.3	<1.3	400 ug/l	80 ug/l
Chloroform	<2.2	<2.2	<2.2	<2.2	6 ug/l	0.6 ug/l
Chloromethane	<2.6	<2.6	<2.6	<2.6	3 ug/l	0.3 ug/l
Dibromochloromethane	<1.6	<1.6	<1.6	<1.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<0.83	<0.83	<0.83	<0.83	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.27	<0.27	<0.27	<0.27	NS	NS
1,1-Dichloroethane	<0.27	1.2	<0.28	<0.28	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.24	<0.24	<0.24	<0.24	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<3.6	<3.6	<3.6	<3.6	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	1.1	<1.1	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<0.28	<0.28	<0.28	<0.28	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.22	<0.22	<0.22	<0.22	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.58	<0.58	<0.58	<0.58	700 ug/l	140 ug/l
Methylene Chloride	<1.2	<1.2	<1.2	<1.2	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<0.47	<0.47	<0.47	<0.47	60 ug/l	6 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	0.39 J	<0.24	<0.24	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J:Analyte detected below quanitiation limits

Groundwater Well MW-14

Test Description Method 8260	Jun-20	Oct-19	Nov-18	Mar-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.50	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.50	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<0.50	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<2.4	10 ug/l	1 ug/l
2-Butanone (MEK)	NTF	NTF	NTF	NTF	460 ug/l	90 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.50	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.50	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<0.37	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<2.5	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<0.50	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<0.50	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<2.2	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.18	NS	NS
1,1-Dichloroethane	29.6	7.1	5.0	35.6	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.17	5 ug/l	0.5 ug/l
1,1-Dichloroethene	3.2	<0.24	<0.24	***5.3***	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	8.6	<0.27	***10.1***	5.7	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	0.37 J	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.23	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.50	700 ug/l	140 ug/l
Methylene Chloride	<0.58	<0.58	<0.58	<0.23	5 ug/l	0.5 ug/l
4-Methyl-2-Pentanone	NTF	NTF	NTF	NTF	500 ug/l	50 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<0.17	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<0.50	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.25	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.50	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.50	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	41.1	<0.24	***68.3***	***67.7***	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.20	5 ug/l	0.5 ug/l
Trichloroethene	**9.2**	<0.26	**10.5**	**5.9**	5 ug/l	0.5 ug/l
Vinyl Chloride	0.80 J	<0.17	**1.2**	**0.59 J**	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<1.50	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J:Analyte detected below quanitiation limits

Groundwater Well MW-15

Test Description Method 8260	Jun-20	Jul-19	Aug-18	Mar-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.50	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.50	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<0.50	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<2.4	10 ug/l	1 ug/l
2-Butanone (MEK)	NTF	NTF	NTF	NTF	460 ug/l	90 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.50	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.50	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<0.37	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<2.5	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<0.50	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<0.50	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<2.2	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<1.6	NS	NS
1,1-Dichloroethane	<0.27	<0.27	<0.27	<0.24	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.17	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.41	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	<0.27	<0.26	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<0.26	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.23	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.50	700 ug/l	140 ug/l
Methylene Chloride	<0.58	<0.58	<0.58	<0.23	5 ug/l	0.5 ug/l
4-Methyl-2-Pentanone	NTF	NTF	NTF	NTF	500 ug/l	50 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<0.17	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<0.50	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.25	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.50	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.50	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	<0.24	<0.50	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.16	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.33	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	<0.18	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<1.5	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits

Groundwater Well MW-16

Test Description Method 8260	Feb-19	Aug-18	Feb-18	Jul-17	NR 140 ES	NR 140 PAL
Benzene	<0.25	<0.25	<0.50	<0.50	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.50	<0.50	0.6 ug/l	0.06 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.50	<0.50	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.50	<0.50	NS	NS
Chloroethane	<1.3	<1.3	<0.37	<0.37	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<2.5	<2.5	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<0.50	<0.50	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<0.50	<0.50	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<2.2	<2.2	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.18	<0.18	NS	NS
1,1-Dichloroethane	<0.27	<0.27	<0.41	<0.41	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.17	<0.17	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.41	<0.41	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	<0.26	<0.26	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<0.26	<0.26	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.23	<0.23	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.50	<0.50	700 ug/l	140 ug/l
2-Hexanone	NTF	NTF	NTF	NTF	NS	NS
Methylene Chloride	<0.58	<0.58	<0.23	<0.23	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<0.17	<0.17	60 ug/l	6 ug/l
Styrene	<0.47	<0.47	<0.50	<0.50	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.25	<0.25	0.2 ug/l	0.02 ug/l
Tetrachlorethane	<0.33	<0.33	<0.50	<0.50	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.50	<0.50	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	<0.50	<0.50	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.20	<0.20	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.33	<0.33	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.18	<0.18	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<1.50	<1.50	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-17

Test Description Method 8260B	Jun-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<4.0	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<0.97	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<1.3	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.83	NS	NS
1,1-Dichloroethane	0.29 J	<0.27	0.43 J	0.39 J	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	<0.27	***<0.27***	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.22	700 ug/l	140 ug/l
2-Hexanone	<0.58	<0.58	<0.58	<0.58	NS	NS
Methylene Chloride	NTF	NTF	NTF	NTF	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	<0.24	0.59 J	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	**<0.26**	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	**<0.17**	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits

Groundwater Well MW-18

Test Description Method 8260	Apr-19	Jun-18	Jun-17	May-16	NR 140 ES	NR 140 PAL
Acetone	NTF	NS - FP	NS - FP	NTF	1000 ug/l	200 ug/l
Benzene	<0.62	NS - FP	NS - FP	<0.50	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.91	NS - FP	NS - FP	<0.50	0.6 ug/l	0.06 ug/l
Bromoform	<9.9	NS - FP	NS - FP	<0.50	4.4 ug/l	0.44 ug/l
Bromomethane	<2.4	NS - FP	NS - FP	<2.4	10 ug/l	1 ug/l
2-Butanone (MEK)	NTF	NS - FP	NS - FP	NTF	460 ug/l	90 ug/l
Carbon Tetrachloride	<0.41	NS - FP	NS - FP	<0.50	5 ug/l	0.5 ug/l
Chlorobenzene	<1.8	NS - FP	NS - FP	<0.50	NS	NS
Chloroethane	<3.4	NS - FP	NS - FP	<0.37	400 ug/l	80 ug/l
2-Chloroethyl Vinyl Ether	NTF	NS - FP	NS - FP	NTF	NS	NS
Chloroform	<3.2	NS - FP	NS - FP	<2.5	6 ug/l	0.6 ug/l
Chloromethane	<5.5	NS - FP	NS - FP	<0.50	3 ug/l	0.3 ug/l
Dibromochloromethane	<6.5	NS - FP	NS - FP	<0.50	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<4.4	NS - FP	NS - FP	<2.2	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<3.1	NS - FP	NS - FP	<0.18	NS	NS
1,1-Dichloroethane	<1.4	NS - FP	NS - FP	<0.24	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.70	NS - FP	NS - FP	<0.17	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.61	NS - FP	NS - FP	<0.41	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.68	NS - FP	NS - FP	<0.26	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<0.27	NS - FP	NS - FP	<0.26	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.71	NS - FP	NS - FP	<0.23	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.55	NS - FP	NS - FP	<0.50	700 ug/l	140 ug/l
Methylene Chloride	<1.5	NS - FP	NS - FP	<0.23	5 ug/l	0.5 ug/l
4-Methyl-2-Pentanone	NTF	NS - FP	NS - FP	NTF	NS	NS
Methyl-tert-Butylether	<3.1	NS - FP	NS - FP	<0.17	60 ug/l	6 ug/l
Styrene	<1.2	NS - FP	NS - FP	<0.50	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.69	NS - FP	NS - FP	<0.26	0.2 ug/l	0.02 ug/l
Tetrachlorethane	<0.82	NS - FP	NS - FP	<0.50	5 ug/l	0.5 ug/l
Toluene	<0.43	NS - FP	NS - FP	0.88 J	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.61	NS - FP	NS - FP	<0.50	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<1.4	NS - FP	NS - FP	<0.20	5 ug/l	0.5 ug/l
Trichloroethene	<0.64	NS - FP	NS - FP	<0.33	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.44	NS - FP	NS - FP	<0.18	0.2 ug/l	0.02 ug/l
Total Xylenes	<1.85	NS - FP	NS - FP	<1.5	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

NS - FP No Sample Free Product

Groundwater Well MW-19

Test Description Method 8260	Jun-20	Jul-19	Feb-19	Aug-18	NR 140 ES	NR 140 PAL
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroethane	<1.3	2.6 J	<1.3	<1.3	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.83	NS	NS
1,1-Dichloroethane	0.42 J	2.6	<0.24	<0.24	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	0.27 J	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	0.60 J	<0.27	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.22	700 ug/l	140 ug/l
Methylene Chloride	<0.58	<0.58	<0.58	<0.58	5 ug/l	0.5 ug/l
Methyl-tert-Butyl-Ether	<1.2	<1.2	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<0.47	<0.47	<0.47	<0.47	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachlorethane	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	0.77 J	<0.24	<0.24	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits

Groundwater Well MW-20

Test Description Method 8260	Apr-19	Jun-18	Jun-17	Apr-15	NR 140 ES	NR 140 PAL
Acetone	NTF	NS - FP	NS - FP	NTF	1000 ug/l	200 ug/l
Benzene	<1.2	NS - FP	NS - FP	<5.0	5 ug/l	0.5 ug/l
Bromodichloromethane	<1.8	NS - FP	NS - FP	<5.0	0.6 ug/l	0.06 ug/l
Bromoform	<19.9	NS - FP	NS - FP	<5.0	4.4 ug/l	0.44 ug/l
Bromomethane	<4.9	NS - FP	NS - FP	<24.3	10 ug/l	1 ug/l
2-Butanone (MEK)	NTF	NS - FP	NS - FP	NTF	460 ug/l	90 ug/l
Carbon Tetrachloride	<0.83	NS - FP	NS - FP	<5.0	5 ug/l	0.5 ug/l
Chlorobenzene	<3.6	NS - FP	NS - FP	<5.0	NS	NS
Chloroethane	<6.7	NS - FP	NS - FP	<3.7	400 ug/l	80 ug/l
2-Chloroethyl Vinyl Ether	NTF	NS - FP	NS - FP	NTF	NS	NS
Chloroform	<6.4	NS - FP	NS - FP	<25.0	6 ug/l	0.6 ug/l
Chloromethane	<10.9	NS - FP	NS - FP	<5.0	3 ug/l	0.3 ug/l
Dibromochloromethane	<13.0	NS - FP	NS - FP	<5.0	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<8.8	NS - FP	NS - FP	<21.6	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<4.1	NS - FP	NS - FP	<1.8	NS	NS
1,1-Dichloroethane	<1.4	NS - FP	NS - FP	<2.4	850 ug/l	85 ug/l
1,2-Dichloroethane	<1.4	NS - FP	NS - FP	<1.7	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<1.2	NS - FP	NS - FP	<4.1	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<1.4	NS - FP	NS - FP	<2.6	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<5.5	NS - FP	NS - FP	<2.6	100 ug/l	20 ug/l
1,2-Dichloropropane	<1.4	NS - FP	NS - FP	<2.3	5 ug/l	0.5 ug/l
Ethyl Benzene	<1.1	NS - FP	NS - FP	<5.0	700 ug/l	140 ug/l
Methylene Chloride	<2.9	NS - FP	NS - FP	<2.3	5 ug/l	0.5 ug/l
4-Methyl-2-Pentanone	NTF	NS - FP	NS - FP	NTF	NS	NS
Methyl-tert-Butyl-Ether	<6.2	NS - FP	NS - FP	<1.7	60 ug/l	6 ug/l
Styrene	<2.3	NS - FP	NS - FP	<5.0	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<1.4	NS - FP	NS - FP	<2.5	0.2 ug/l	0.02 ug/l
Tetrachlorethane	<1.6	NS - FP	NS - FP	<5.0	5 ug/l	0.5 ug/l
Toluene	<0.86	NS - FP	NS - FP	<5.0	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<1.2	NS - FP	NS - FP	<5.0	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<2.8	NS - FP	NS - FP	<2.0	5 ug/l	0.5 ug/l
Trichloroethene	<1.3	NS - FP	NS - FP	<3.3	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.87	NS - FP	NS - FP	<1.8	0.2 ug/l	0.02 ug/l
Total Xylenes	<3.6	NS - FP	NS - FP	<15.0	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits
NS - FP No Sample Free Product

Groundwater Well MW-21

Test Description Method 8260	Apr-19	Jun-18	Jun-17	May-16	NR 140 ES	NR 140 PAL
Acetone	NTF	NS - FP	NS - FP	NTF	1000 ug/l	200 ug/l
Benzene	<0.62	NS - FP	NS - FP	<2.5	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.91	NS - FP	NS - FP	<2.5	0.6 ug/l	0.06 ug/l
Bromoform	<9.9	NS - FP	NS - FP	<2.5	4.4 ug/l	0.44 ug/l
Bromomethane	<2.4	NS - FP	NS - FP	<12.2	10 ug/l	1 ug/l
2-Butanone (MEK)	NTF	NS - FP	NS - FP	NTF	460 ug/l	90 ug/l
Carbon Tetrachloride	<0.41	NS - FP	NS - FP	<2.5	5 ug/l	0.5 ug/l
Chlorobenzene	<1.8	NS - FP	NS - FP	<2.5	NS	NS
Chloroethane	<3.4	NS - FP	NS - FP	<1.9	400 ug/l	80 ug/l
2-Chloroethyl Vinyl Ether	NTF	NS - FP	NS - FP	NTF	NS	NS
Chloroform	<3.2	NS - FP	NS - FP	<12.5	6 ug/l	0.6 ug/l
Chloromethane	<5.5	NS - FP	NS - FP	<2.5	3 ug/l	0.3 ug/l
Dibromochloromethane	<6.5	NS - FP	NS - FP	<2.5	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<4.4	NS - FP	NS - FP	<10.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<3.1	NS - FP	NS - FP	<0.89	NS	NS
1,1-Dichloroethane	1.5 J	NS - FP	NS - FP	<1.2	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.70	NS - FP	NS - FP	<0.84	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.61	NS - FP	NS - FP	<2.1	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.68	NS - FP	NS - FP	<1.3	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<0.27	NS - FP	NS - FP	<1.2	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.71	NS - FP	NS - FP	<1.2	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.55	NS - FP	NS - FP	<2.5	700 ug/l	140 ug/l
Methylene Chloride	<1.5	NS - FP	NS - FP	<1.2	5 ug/l	0.5 ug/l
4-Methyl-2-Pentanone	NTF	NS - FP	NS - FP	NTF	NS	NS
Methyl-tert-Butyl-Ether	<3.1	NS - FP	NS - FP	<0.87	60 ug/l	6 ug/l
Styrene	<1.2	NS - FP	NS - FP	<2.5	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.69	NS - FP	NS - FP	<1.2	0.2 ug/l	0.02 ug/l
Tetrachlorethane	<0.82	NS - FP	NS - FP	<2.5	5 ug/l	0.5 ug/l
Toluene	<0.43	NS - FP	NS - FP	<2.5	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.61	NS - FP	NS - FP	<2.5	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<1.4	NS - FP	NS - FP	<0.99	5 ug/l	0.5 ug/l
Trichloroethene	<0.64	NS - FP	NS - FP	<1.7	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.44	NS - FP	NS - FP	<0.88	0.2 ug/l	0.02 ug/l
Total Xylenes	<1.85	NS - FP	NS - FP	<7.5	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

NS - FP No Sample Free Product

Groundwater Well MW-22

Test Description Method 8260B	Jun-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<4.0	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<0.97	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<1.3	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.83	NS	NS
1,1-Dichloroethane	0.39 J	<0.27	0.69 J	1.0	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	<0.27	<0.27	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.22	700 ug/l	140 ug/l
2-Hexanone	<0.58	<0.58	<0.58	<0.58	NS	NS
Methylene Chloride	NTF	NTF	NTF	NTF	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	<0.24	1.1	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits
NS - FP No Sample Free Product

Groundwater Well MW-23

Test Description Method 8260B	Jun-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<4.0	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<0.97	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<1.3	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.83	NS	NS
1,1-Dichloroethane	0.68 J	<0.27	2.9	2.3	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	<0.27	***<0.27***	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.22	700 ug/l	140 ug/l
2-Hexanone	<0.58	<0.58	<0.58	<0.58	NS	NS
Methylene Chloride	NTF	NTF	NTF	NTF	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	0.54 J	1.6	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits

Groundwater Well MW-24

Test Description					NR 140	NR 140
Method 8260B	**Jun-20**	**Nov-19**	**Apr-19**	**Nov-18**	**ES**	**PAL**
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.99	<0.99	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<1.5	<1.5	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<15.9	<15.9	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<3.9	<3.9	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.66	<0.66	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<2.8	<2.8	NS	NS
Chloroethane	<1.3	<1.3	9.2 J	9.7 J	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<5.1	<5.1	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<8.8	<8.8	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<10.4	<10.4	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<7.1	<7.1	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<3.3	<3.3	NS	NS
1,1-Dichloroethane	***251***	0.48 J	***271***	***309***	850 ug/l	85 ug/l
1,2-Dichloroethane	***1.3 J***	<0.28	<1.1	***1.8 J***	5 ug/l	0.5 ug/l
1,1-Dichloroethene	***1.7 J***	<0.24	<0.98	***1.9 J***	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	<1.1	<1.1	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<4.4	<4.4	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<1.1	<1.1	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.87	<0.87	700 ug/l	140 ug/l
2-Hexanone	NTF	NTF	NTF	NTF	NS	NS
Methylene Chloride	<0.58	<0.58	<2.3	<2.3	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<5.0	<5.0	60 ug/l	6 ug/l
Styrene	<0.47	<0.47	<1.9	<1.9	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.28	<0.28	<1.1	<1.1	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<1.3	<1.3	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.69	<0.69	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	***32.9***	<0.24	29.0	***43.5***	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<2.2	<2.2	5 ug/l	0.5 ug/l
Trichloroethene	**5.5**	***0.64 J***	<1.0	<1.0	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	**5.3**	**6.6**	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<2.9	<2.9	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits

Groundwater Well MW-25

Test Description Method 8260	Mar-20	Nov-19	Apr-19	Nov-18	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	<4.0	<4.0	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	<0.97	<0.97	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroethane	<1.3	<1.3	<1.3	<1.3	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	<1.8	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.83	NS	NS
1,1-Dichloroethane	68.9	***104***	***126***	73.8	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	0.47 J	***0.65 J***	0.29 J	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	1.8	3.6	4.4	***2.6***	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.22	700 ug/l	140 ug/l
2-Hexanone	<0.58	<0.58	<0.58	<0.58	NS	NS
Methylene Chloride	NTF	NTF	NTF	NTF	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	<1.2	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	1.3	3.5	5.2	4.6	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	**0.44 J**	**0.82 J**	**1.0**	**0.53 J**	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l

B: Analyte detected in the associated Method Blank

J: Analyte detected below quanitiation limits

Groundwater Well MW-26

Test Description Method 8260	Jun-20	Jul-19	NR 140 ES	NR 140 PAL
Acetone	NTF	NTF	1000 ug/l	200 ug/l
Benzene	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Bromoform	<4.0	<4.0	4.4 ug/l	0.44 ug/l
Bromomethane	<0.97	<0.97	10 ug/l	1 ug/l
Carbon Disulfide	NTF	NTF	1000 ug/l	200 ug/l
Carbon Tetrachloride	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	NS	NS
Chloroethane	3.6 J	<1.3	400 ug/l	80 ug/l
Chloroform	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.8	<1.8	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	NS	NS
1,1-Dichloroethane	2.4	0.74 J	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.24	<0.24	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	0.87 J	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	700 ug/l	140 ug/l
2-Hexanone	<0.58	<0.58	NS	NS
Methylene Chloride	NTF	NTF	5 ug/l	0.5 ug/l
Methyl-tert-Butylether	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<1.2	<1.2	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.28	<0.28	0.2 ug/l	0.02 ug/l
Tetrachloroethene	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	0.31 J	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l
B: Analyte detected in the associated Method Blank
J: Analyte detected below quanitiation limits

Groundwater Well MW-402N

Test Description Method 8260	Jun-20	Jul-19	Feb-19	Aug-18	NR 140 ES	NR 140 PAL
Benzene	<0.25	<0.25	<0.25	<0.25	5 ug/l	0.5 ug/l
Bromodichloromethane	<0.36	<0.36	<0.36	<0.36	0.6 ug/l	0.06 ug/l
Carbon Tetrachloride	<0.17	<0.17	<0.17	<0.17	5 ug/l	0.5 ug/l
Chlorobenzene	<0.71	<0.71	<0.71	<0.71	NS	NS
Chloroform	<1.3	<1.3	<1.3	<1.3	6 ug/l	0.6 ug/l
Chloromethane	<2.2	<2.2	<2.2	<2.2	3 ug/l	0.3 ug/l
Dibromochloromethane	<2.6	<2.6	<2.6	<2.6	60 ug/l	6 ug/l
1,2-Dibromo-3-chloropropane	<1.6	<1.6	<1.6	<1.6	0.2 ug/l	0.02 ug/l
1,2-Dibromomethane	<0.83	<0.83	<0.83	<0.83	NS	NS
1,1-Dichloroethane	0.44 J	0.31 J	<0.27	<0.27	850 ug/l	85 ug/l
1,2-Dichloroethane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
1,1-Dichloroethene	<0.24	<0.24	<0.24	<0.24	7 ug/l	0.7 ug/l
cis-1,2-Dichloroethene	<0.27	<0.27	1.1	<3.6	70 ug/l	7 ug/l
trans-1,2-Dichloroethene	<1.1	<1.1	<1.1	<1.1	100 ug/l	20 ug/l
1,2-Dichloropropane	<0.28	<0.28	<0.28	<0.28	5 ug/l	0.5 ug/l
Ethyl Benzene	<0.22	<0.22	<0.22	<0.22	700 ug/l	140 ug/l
Methylene Chloride	<0.58	<0.58	<0.58	<0.58	5 ug/l	0.5 ug/l
Methyl-tert-Butyl-Ether	<1.2	<1.2	<1.2	<1.2	60 ug/l	6 ug/l
Styrene	<0.47	<0.47	<0.47	<0.47	100 ug/l	10 ug/l
1,1,2,2-Tetrachloroethane	<0.27	<0.27	<0.27	<0.27	0.2 ug/l	0.02 ug/l
Tetrachlorethane	<0.33	<0.33	<0.33	<0.33	5 ug/l	0.5 ug/l
Toluene	<0.17	<0.17	<0.17	<0.17	1 mg/l	0.2 mg/l
1,1,1-Trichloroethane	<0.24	<0.24	<0.24	<0.24	200 ug/l	40 ug/l
1,1,2-Trichloroethane	<0.55	<0.55	<0.55	<0.55	5 ug/l	0.5 ug/l
Trichloroethene	<0.26	<0.26	<0.26	<0.26	5 ug/l	0.5 ug/l
Vinyl Chloride	<0.17	<0.17	<0.17	<0.17	0.2 ug/l	0.02 ug/l
Total Xylenes	<0.73	<0.73	<0.73	<0.73	10 mg/l	1 mg/l

VOCs reported in units of ug/l
Analyte detected in the associated Method Blank
Analyte detected below quanitiation limits

DISCUSSION

The groundwater results obtained from the groundwater samplings performed by Environmental Audits, Inc. at the Twin Disc, Inc. Plant 3 Machine #2525 Broach monitoring wells variously exceeded the s. NR 140.10 Public Health related groundwater standards for Benzene, Chloroethane, Chloroform, Chloromethane, 1,1-Dichloroethane, 1,2-Dichloroethane, 1,1-Dichloroethene, cis- 1,1-Dichloroethane, Methylene Chloride, Tetrachloroethene, 1,1,2,2-Tetrachloroethene, trans-1,2-Dichloroethene, 1,1,1-Trichloroethane, 1,1,2-Trichloroethane, Trichloroethene, and Vinyl Chloride.

The 2nd Quarter 2020 sampling round shows that 1,1,1-Trichloroethane was detected at MW14 (41.1 ug/l) and MW-24 (32.9 ug/l). The 1st Quarter 2020 sampling round shows that 1,1,1-Trichloroethane was detected at MW-1 (0.24 ug/l) and MW-25 (1.3 ug/l). The 4th Quarter 2019 sampling round shows that 1,1,1-Trichloroethane was detected at MW-1 (1.4 ug/l) and MW-25 (3.5 ug/l). The 3rd Quarter 2019 sampling round shows that 1,1,1-Trichloroethane was detected at MW-11 (8.3 ug/l), MW-13 (0.39 J ug/l), MW-19 (0.77 J ug/l), and MW-26 (5.2 ug/l). The s. NR 140 Preventative Action Limit (PAL) is 40 ug/l for 1,1,1-Trichloroethane and the Enforcement Standard (ES) is 200 ug/l.

The 2nd Quarter 2019 sampling round shows that 1,1-Dichloroethane was detected at MW-14 (29.6 ug/l), MW-17 (0.29 J ug/l), MW-19 (0.42 J ug/l), MW-22 (0.39 J ug/l), MW-23 (0.69 J ug/l), MW-24 (251 ug/l), MW-26 (2.4 ug/l), and MW-402N (0.44 J ug/l). The 1st Quarter 2020 sampling round shows that 1,1-Dichloroethane was detected at MW-1 (34.4 ug/l), MW-2 (14.6 ug/l), MW-6 (93.7 ug/l), MW-7 (1.3 ug/l), MW-9 (1.6 ug/l), MW-10 (1.6 J ug/l), and MW-25 (68.9 ug/l). The 4th Quarter 2019 sampling round shows that 1,1-Dichloroethane was detected at MW-1 (53.9 ug/l), MW-2 (15.4 ug/l), MW-6 (118 ug/l), MW-7 (1.3 ug/l), MW-9 (1.6 ug/l), MW-10 (1.5 ug/l), MW-14 (7.1 ug/l), MW-24 (0.48 J ug/l), and MW-25 (104 ug/l). The 3rd Quarter 2019 sampling round shows that 1,1-Dichloroethane was detected at MW-11 40.5 ug/l), MW-13 (1.2 ug/l), MW-19 (2.6 ug/l), MW-26 (0.74 J ug/l), and MW-402N (0.31 J ug/l). The PAL was exceeded at MW-6 during the 1st Quarter 2020 and 4th Quarter 2019 sampling event. The PAL was exceeded at MW-24 during the 2nd Quarter 2020 sampling event. The PAL was exceeded at MW-25 during the 4th Quarter 2019 sampling event.

The 2nd Quarter 2020 sampling round shows that 1,2-Dichloroethane was detected at MW-24 (1.3 ug/l J). The 4th Quarter 2019 sampling round shows that 1,2-Dichloroethane was detected at MW-25 (0.47 ug/l J). The PAL is 0.5 ug/l and the ES is 5 ug/l for 1,2-Dichloroethane. The PAL was exceeded at MW-24 during the 2nd Quarter 2020 sampling event. The PAL was exceeded at MW-25 during the 4th Quarter 2019 sampling event.

The 2nd Quarter 2020 sampling round shows that 1,1-Dichloroethene was detected at MW-14 (3.2 ug/l) and MW-24 (0.17 J ug/l). The 3rd Quarter 2019 sampling round shows that 1,1-Dichloroethene was detected at MW-11 (1.2 J ug/l) and MW-19 (0.27 J ug/l). The PAL is 0.5 ug/l and the ES is 5 ug/l for 1,1-Dichloroethene. The PAL was exceeded at MW-14 during the 3rd Quarter 2016 and the 1st Quarter 2017 sampling event. The PAL was exceeded at MW-24 during the 2nd Quarter 2017 sampling event. The ES was exceeded at MW-14 during the July 2015, 1st Quarter 2016, 3rd Quarter 2017 sampling event, and 1st Quarter 2018. The PAL was exceeded at MW-11 during the 3rd Quarter 2019 sampling event. The PAL was exceeded at MW-14 during the 2nd Quarter 2020 sampling event.

The 2nd Quarter 2020 sampling round shows that cis-1,2-Dichloroethene was detected at MW-11 (133 ug/l) and MW-14 (8.6 ug/l). The 1st Quarter 2020 sampling round shows that cis-1,2-Dichloroethene was detected at MW-1 (0.40 J ug/l), MW-6 (1.2 J ug/l), MW-9 (0.84 J ug/l), and MW-25 (1.8 ug/l). The 4th Quarter 2019 sampling round shows that cis-1,2-Dichloroethene was detected at MW-1 (0.65 J ug/l), MW-6 (1.9 J ug/l), MW-9 (1.3 ug/l), MW-10 (0.76 J ug/l), and MW-25 (3.6 ug/l). The 3rd Quarter 2019 sampling round shows that cis-1,2-Dichloroethene was detected at MW-11 (143 ug/l) and MW-26 (0.87 J ug/l). The PAL is 7 ug/l and the ES is 70 ug/l for cis-1,2-Dichloroethene. The PAL was exceeded at MW-14 during the 2nd Quarter 2020 sampling event. The ES was exceeded at MW-11 during the 3rd Quarter 2019 and 2nd Quarter 2020 sampling event.

The 2nd Quarter 2020 sampling round showed that trans-1,2-Dichloroethene was detected at MW-11 (7.2 ug/l).The 4th Quarter 2019 sampling round showed that trans-1,2-Dichloroethene was detected at MW-10 (3.8 J ug/l). The 3rd Quarter 2019 sampling round showed that trans-1,2-Dichloroethene was detected at MW-11 (7.6 ug/l). The PAL is 20 ug/l and the ES is 100 ug/l for trans-1,2-Dichloroethene.

The 1st Quarter 2020 sampling round shows that 1,2-Dichlorobenzene was detected at MW-10 (1.6 J ug/l). The PAL is 60 ug/l and the ES is 600 ug/l for 1,2-Dichlorobenzene.

The 2nd Quarter 2016 sampling round shows that 1,4-Dichlorobenzene was detected at MW-7 (1.5 J ug/l) and MW-10 (1.0 J ug/l). The PAL is 15 ug/l and the ES is 75 ug/l for 1,4-Dichlorobenzene.

The 2nd Quarter 2020 sampling round shows that Trichloroethene was detected at MW-11 (4.9 ug/l), MW-14 (9.2 ug/l) and MW-24 (5.5 ug/l). The 1st Quarter 2020 sampling round shows that Trichloroethene was detected at MW-1 (0.24 ug/l) and MW-25 (1.3 ug/l). The 4th Quarter 2019 sampling round shows that Trichloroethene was detected at MW-24 (0.64 J ug/l). The 3rd Quarter 2019 sampling round shows that Trichloroethene was detected at MW-11 (4.8 ug/l). The PAL is 0.5 ug/l and the ES is 5 ug/l for Trichloroethene. The PAL was exceeded at MW-11 during the 2nd Quarter 2020 sampling event. The ES was exceeded at MW-14 during the 2nd Quarter 2020. The ES was exceeded at MW-24 during the 2nd Quarter 2020 sampling event.

Chloroethane was detected at MW-26 (3.6 J ug/l) during the 2nd Quarter 2020 sampling event. Chloroethane was detected at MW-1 (8.2 ug/l) and MW-6 (4.2 J ug/l) during the 1st Quarter 2020 sampling event. Chloroethane was detected at MW-1 (17.1 ug/l), MW-2 (7.0 ug/l), MW-6 (7.8 J ug/l), and MW-9 (1.8 J ug/l) during the 4th Quarter 2019 sampling event. Chloroethane was detected at MW-13 (1.7 J ug/l) and MW-19 (2.6 J ug/l) during the 3rd Quarter 2019 sampling event. The PAL is 80 ug/l and the ES is 400 ug/l for Chloroethane.

The 2nd Quarter 2020 sampling round shows that Tetrachloroethene was detected at MW-11 (2.7 ug/l). The 3rd Quarter 2019 sampling round shows that Tetrachloroethene was detected at MW-11 (4.8 ug/l). The 1st Quarter 2019 sampling round shows that Tetrachloroethene was detected at MW-11 (4.9 ug/l). Tetrachloroethene was not detected at any monitoring well, in quantities above the method detection limit, during the 4th Quarter 2019 sampling event. The PAL is 0.5 ug/l and the ES is 5 ug/l for Tetrachloroethylene. The PAL was exceeded at MW-11 during the 2nd Quarter 2020 and 3rd Quarter 2019 sampling event.

The 2nd Quarter 2020 sampling round shows that Vinyl Chloride was detected at MW-14 (0.80 J ug/l). The 1st Quarter 2020 sampling round shows that Vinyl Chloride was detected at MW-1 (1.8 ug/l), MW-6 (0.93 J ug/l), MW-7 (1.3 ug/l), MW-10 (142 ug/l), MW-14 (1.2 ug/l), and MW-25 (0.44 J ug/l). The 4th Quarter 2019 sampling round shows that Vinyl Chloride was detected at MW-1 (3.9 ug/l), MW-6 (1.1 J ug/l), MW-10 (214 ug/l), MW-14 (1.2 ug/l), and MW-25 (0.82 J ug/l). The 3rd Quarter 2019 sampling round shows that Vinyl Chloride was detected at MW-11 (2.0 ug/l). The PAL is 0.02 ug/l and the ES is 0.2 ug/l for Vinyl Chloride. The ES was exceeded at MW-14 during the 2nd Quarter 2020 sampling event. The ES was exceeded at MW-1, MW-6, MW-7, MW-10, MW-14, and MW-25 during the 1st Quarter 2020 sampling event. The ES was exceeded at MW-1, MW-6, MW-10, MW-14, and MW-25 during the 4th Quarter 2019 sampling event. The ES was exceeded at MW-11 during the 3rd Quarter 2019

The above-mentioned compounds are "daughter" compounds of 1,1,1-Trichloroethane, an indication that natural attenuation of the halogenated compounds may be occurring. More investigative effort is required to confirm this.

Benzene was detected at MW-1 (0.29 J ug/l) during the 4th Quarter 2019 sampling event. The PAL is 0.5 ug/l and the ES is 5.0 ug/l for Benzene.

The 3rd Quarter 2018 sampling round shows that Methylene Chloride was detected at MW-11 (9.4 J ug/l). Methylene Chloride was detected at MW-24 (1.7 J ug/l) during the 4th Quarter 2017 sampling event. The PAL is 0.5 ug/l and the ES is 5 ug/l for Methylene Chloride. The PAL was exceeded at MW-24 during the 2nd Quarter 2016 and 4th Quarter 2016 sampling event. The ES was exceeded at MW-11 during the 3rd Quarter 2018 sampling event.

Toluene was detected at MW-1 (0.38 J ug/l) during the 4th Quarter 2019 sampling event Toluene was not detected at any monitoring well, above the limits of detection, during the 2nd Quarter or 3rd Quarter 2019 sampling event. The PAL is 0.2 mg/l and the ES is 1 mg/l for Toluene.

DRO sampling was discontinued as a regular analytical parameter as of the 2nd Quarter 2016 groundwater analysis.

Vapor Intrusion:

A Vapor Intrusion characterization standard was added to the NR716 Site Investigation protocol as 716.05(1) during December 2010. This protocol requires all sites exhibiting VOC/CVOC contamination to conduct a testing program to identify and quantify levels of VOC/CVOC vapors present in the subsurface soils and above surface ambient air. The intent of this new requirement is to prevent exposures that negatively impact human health in terms of excess risk per USEPA and Center for Disease Control (CDC) standards.

As a result of this new legislation, a Vapor Intrusion monitoring program must be implemented in order to obtain Site Closure.

The United States Environmental Protection Agency (USEPA) guidance "OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)" EPA530-D-02-004, dated November 2002 and the State of Wisconsin Department of Health and Family Services (WI DHFS) Division of Public Health guidance "Chemical Vapor Intrusion and Residential Indoor Air Guidance for Environmental Consultants and Contractors" dated February 13, 2003 were utilized for the evaluation of the Vapor Intrusion Pathway

To that end, Environmental Audits, Inc. placed thirty-two (32) discrete sub-slab sampling ports around and about the Twin Disc, Inc. Plant 3 facility. These sub-slab sampling ports were sampled commencing March 28, 2012 with the latest sampling event occurring July 27, 2017.

The OSWER Draft Guidance recommends that an inhabited building generally be considered "near" subsurface contaminants if it is located within approximately 100 ft laterally or vertically of known or interpolated soil gas or groundwater contaminants.[1]

The OSWER Draft Guidance states "Petroleum hydrocarbons biodegrade relatively well

1 *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)"* EPA530-D-02-004, dated November 2002, Page 16

in unsaturated soils. Therefore, petroleum-related VOCs generally have to be in "free product" state or groundwater very near, if not in contact with, the building foundation to result in vapor intrusion. In contrast, chlorinated solvents undergo limited biodegradation and can cause a vapor intrusion concern even when the source is a long distance away."[2]

No residences are located within 100 feet of the building proper and therefore an off-site sub-slab Vapor Intrusion investigation would not appear warranted for this Site.

The sub-slab investigation conducted to date has indicated the presence of Volatile Organic compounds beneath the Twin Disc, Inc. Plant 3 facility. Additional investigative effort is warranted to further identify the effects of seasonality on the detected compounds. Additional sample ports are warranted in the Twin Disc, Inc. Plant 3 Engineering and Human Resource offices to confirm or refute the presence of Volatile Organic Compounds in the theoretical plume beneath these office areas.

The complete summary of the Vapor Intrusion findings to date will be provided in a stand-alone document.

CONCLUSIONS/RECOMMENDATIONS:

The purpose of the installation of monitoring wells MW-22, MW-23, and MW-24 was due to the increase in measured free product at MW-18. MW-18 was considered to be beyond the easternmost extent of free product migration. Free product was not expected to be found at MW-18. Free product was measured at 70" at MW-18 during June 2009, an increase from 5" during June 1998. The three additional monitoring wells were placed to determine if the free product measured at MW-18 was caused by migration from the Broach Machine #2525 or if a secondary source is present, contributing to the product levels found at MW-18. The increase in free product levels noted at MW-20 and MW-21, both side gradient to the Broach Pit, suggest a secondary source.

On March 27, 2003, an additional Monitoring Well, MW-25, was constructed and two (2) additional Geoprobe® borings were obtained around and about a waste oil/solvent pit located in the interior of the Twin Disc facility. The purpose of this investigation was to determine if the waste oil/solvent pit was acting as a secondary source. From the data obtained to date, the waste oil/solvent pit does not appear to be a secondary source of free product.

MW-26 was constructed on June 17, 2019 as a replacement for MW-16. MW-16 was

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2 *OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance)"* EPA530-D-02-004, dated November 2002, Page 16

removed from service due to the placement of a new machine and the requisite machine base.

Twin Disc is addressing the increase in free product levels through enhancements to their free product recovery network. A pilot study was conducted during June 2009 to determine the effectiveness the Xitech Instruments, Inc. pneumatic oil skimming equipment. The results of this study were favorable and three (3) additional pneumatic oil skimming recovery pumps were installed in MW-18, MW-20, and MW-21 during August 2009. These three recovery pumps have been optimized.

Selected interior and perimeter monitoring wells will continue to be sampled for VOCs semi-annually, alternating quarterly, during 2020. The next groundwater-sampling round will occur during the 3rd Quarter 2020.

A Vapor Intrusion characterization standard was added to the NR716 Site Investigation protocol as 716.05(1) during December 2010. This protocol requires all sites exhibiting VOC/CVOC contamination to conduct a testing program to identify and quantify levels of VOC/CVOC vapors present in the subsurface soils and above surface ambient air. The intent of this new requirement is to prevent exposures that negatively impact human health in terms of excess risk per USEPA and Center for Disease Control (CDC) standards.

As a result of this new legislation, a Vapor Intrusion monitoring program has been implemented in order to facilitate Site Closure.

The objective is to provide effective remediation of the site in both a practical and cost efficient manner.

LIST OF APPENDICES

APPENDIX I: Well Location/Flow Direction Maps

APPENDIX II: Laboratory Reports

APPENDIX III: Mann-Kendall Statistical Tests

APPENDIX IV: Vapor Intrusion Results

APPENDIX I: Well Location/Flow Direction Maps

State of Wis., Dept. of Natural Resources
dnr.wi.gov

Well / Drillhole / Borehole Filling & Sealing Report

Form 3300-005 (R 4/2015)

Notice: Completion of this report is required by chs. 160, 281, 283, 289, 291-293, 295, and 299, Wis. Stats., and chs. NR 141 and 812, Wis. Adm. Code. In accordance with chs. 281, 289, 291-293, 295, and 299, Wis. Stats., failure to file this form may result in a forfeiture of between $10-25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. Return form to the appropriate DNR office and bureau. See instructions on reverse for more information.

☐ **Verification Only of Fill and Seal**

Route to DNR Bureau:
☐ Drinking Water ☐ Watershed/Wastewater ☐ Remediation/Redevelopment
☐ Waste Management ☐ Other: _____

1. Well Location Information

County	WI Unique Well # of Removed Well	Hicap #

Latitude / Longitude (see instructions): 42.705553 N / -87.833650 W
Format Code: ☐ DD ☐ DDM
Method Code: ☐ GPS008 ☐ SCR002 ☐ OTH001

¼ / ¼	¼	Section	Township	Range
or Gov't Lot #			N	☐ E ☐ W

Well Street Address: 4600 21st ST
Well City, Village or Town: RACINE, WI
Well ZIP Code: 53403
Subdivision Name:
Lot #:

Reason for Removal from Service: REPLACEMENT/MOVE
WI Unique Well # of Replacement Well:

2. Facility / Owner Information

Facility Name: TWIN DISC, INC
Facility ID (FID or PWS):
License/Permit/Monitoring #:
Original Well Owner:
Present Well Owner:
Mailing Address of Present Owner:
City of Present Owner | State | ZIP Code:

3. Filled & Sealed Well / Drillhole / Borehole Information

☒ Monitoring Well ☐ Water Well ☐ Borehole / Drillhole

Original Construction Date (mm/dd/yyyy): 06/17/19

If a Well Construction Report is available, please attach.

Construction Type:
☒ Drilled ☐ Driven (Sandpoint) ☐ Dug
☐ Other (specify): _____

Formation Type:
☐ Unconsolidated Formation ☐ Bedrock

Total Well Depth From Ground Surface (ft.)	Casing Diameter (in.)
25'	2

Lower Drillhole Diameter (in.)	Casing Depth (ft.)

Was well annular space grouted? ☐ Yes ☐ No ☐ Unknown

If yes, to what depth (feet)?	Depth to Water (feet)

4. Pump, Liner, Screen, Casing & Sealing Material

Pump and piping removed?	☒ Yes	☐ No	☐ N/A
Liner(s) removed?	☐ Yes	☐ No	☐ N/A
Liner(s) perforated?	☐ Yes	☐ No	☐ N/A
Screen removed?	☒ Yes	☐ No	☐ N/A
Casing left in place?	☐ Yes	☐ No	☐ N/A
Was casing cut off below surface?	☒ Yes	☐ No	☐ N/A
Did sealing material rise to surface?	☒ Yes	☐ No	☐ N/A
Did material settle after 24 hours?	☐ Yes	☐ No	☐ N/A
If yes, was hole retopped?	☐ Yes	☐ No	☐ N/A
If bentonite chips were used, were they hydrated with water from a known safe source?	☐ Yes	☐ No	☐ N/A

Required Method of Placing Sealing Material
☐ Conductor Pipe-Gravity ☐ Conductor Pipe-Pumped
☒ Screened & Poured (Bentonite Chips) ☐ Other (Explain): _____

Sealing Materials
☐ Neat Cement Grout ☒ Concrete 150 lbs
☐ Sand-Cement (Concrete) Grout ☒ Bentonite Chips

For Monitoring Wells and Monitoring Well Boreholes Only:
☐ Bentonite Chips ☒ Bentonite - Cement Grout
☐ Granular Bentonite ☐ Bentonite - Sand Slurry

5. Material Used to Fill Well / Drillhole

From (ft.)	To (ft.)	No. Yards, Sacks Sealant or Volume (circle one)	Mix Ratio or Mud Weight
Surface			

6. Comments

7. Supervision of Work

Name of Person or Firm Doing Filling & Sealing	License #	Date of Filling & Sealing or Verification (mm/dd/yyyy)
JAMES BOARD		

Street or Route:
Telephone Number: ( )

City	State	ZIP Code	Signature of Person Doing Work	Date Signed
				06/17/19

DNR Use Only

Date Received	Noted By

Comments:

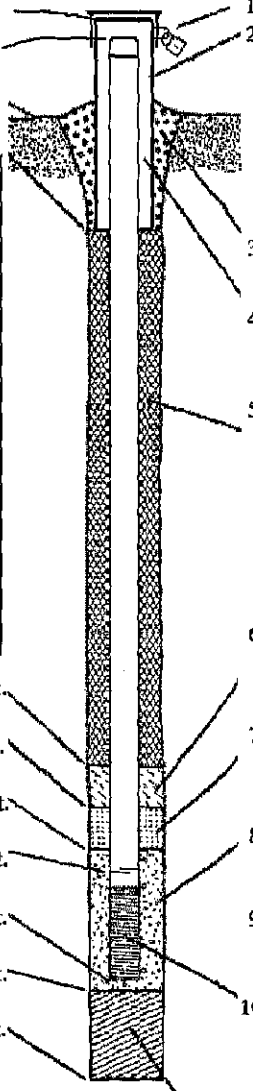
State of Wisconsin
Department of Natural Resources

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: Twin Disc Plant 3	Local Grid Location of Well: _____ ft. ☐N. ☐S. _____ ft. ☐E. ☐W.	Well Name: MW-26
Facility License, Permit or Monitoring No.	Local Grid Origin ☐ (estimated: ☐) or Well Location ☐ Lat. 42.705553 " Long. -87.833650 " or	Wis. Unique Well No. _____ DNR Well ID No. _____
Facility ID _____	St. Plane _____ ft. N, _____ ft. E. S/C/N	Date Well Installed 06/17/2019 (m m d d y y y y)
Type of Well: Monitoring Well; Well Code _____ / _____	Section Location of Waste/Source: _____ 1/4 of _____ 1/4 of Sec. _____, T. _____ N, R. _____ ☐E ☐W	Well Installed By: Name (first, last) and Firm: James Blair; Giles Engineering
Distance from Waste/Source _____ ft. Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known	Gov. Lot Number _____



A. Protective pipe, top elevation _____ ft. MSL

B. Well casing, top elevation _____ ft. MSL

C. Land surface elevation _____ ft. MSL

D. Surface seal, bottom _____ ft. MSL or _____ ft.

12. USCS classification of soil near screen:
GP ☐ GM ☐ GC ☐ GW ☐ SW ☐ SP ☐
SM ☐ SC ☐ ML ☐ MH ☐ CL ☐ CH ☐
Bedrock ☐

13. Sieve analysis performed? ☐ Yes ☒ No

14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ _____

15. Drilling fluid used: Water ☐ 02; Air ☐ 01; Drilling Mud ☐ 03; None ☒ 99

16. Drilling additives used? ☐ Yes ☒ No

Describe _____

17. Source of water (attach analysis, if required):

_____

E. Bentonite seal, top _____ ft. MSL or 0.00 ft.

F. Fine sand, top _____ ft. MSL or 4.00 ft.

G. Filter pack, top _____ ft. MSL or 5.00 ft.

H. Screen joint, top _____ ft. MSL or 6.00 ft.

I. Well bottom _____ ft. MSL or 25.00 ft.

J. Filter pack, bottom _____ ft. MSL or 30.00 ft.

K. Borehole, bottom _____ ft. MSL or 30.00 ft.

L. Borehole, diameter 8.25 in.

M. O.D. well casing _____ in.

N. I.D. well casing 2.0 in.

1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: _____ in.
b. Length: _____ ft.
c. Material: _____ Steel ☐ 04; Other ☐ _____
d. Additional protection? ☐ Yes ☒ No
If yes, describe: _____

3. Surface seal: _____ Bentonite ☒ 30; Concrete ☐ 01; Other ☐ _____

4. Material between well casing and protective pipe: _____ Bentonite ☒ 30; Other ☐ _____

5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. _____ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. _____ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. 2 bags Ft³ volume added for any of the above
f. How installed: Tremie ☐ 01; Tremie pumped ☐ 02; Gravity ☒ 08

6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐1/4 in. ☒3/8 in. ☐1/2 in. Bentonite chips ☒ 32
c. 1/2 bag Other ☐ _____

7. Fine sand material: Manufacturer, product name & mesh size
a. _____
b. Volume added 0.5 ft³

8. Filter pack material: Manufacturer, product name & mesh size
a. _____
b. Volume added 2.0 ft³

9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ _____

10. Screen material: PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ _____
b. Manufacturer _____
c. Slot size: 0.100 in.
d. Slotted length: _____ ft.

11. Backfill material (below filter pack): _____ None ☒ 14; Other ☐ _____

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature	Firm
James Blair	Giles Engineering

Please complete both Forms 4400-113A and 4400-113B and return them to the appropriate DNR office and bureau. Completion of these reports is required by chs. 160, 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats., and ch. NR 141, Wis. Adm. Code. In accordance with chs. 281, 289, 291, 292, 293, 295, and 299, Wis. Stats., failure to file these forms may result in a forfeiture of between $10 and $25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on these forms is not intended to be used for any other purpose. NOTE: See the instructions for more information, including where the completed forms should be sent.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

Route to: Watershed/Wastewater ☐ Waste Management ☐
Remediation/Redevelopment ☒ Other ☐ _____

Facility/Project Name	County Name	Well Name
Twin Disc Plant 3		MW 26

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number

1. Can this well be purged dry? ☒ Yes ☐ No

2. Well development method

surged with bailer and bailed	☒ 41
surged with bailer and pumped	☐ 61
surged with block and bailed	☐ 42
surged with block and pumped	☐ 62
surged with block, bailed and pumped	☐ 70
compressed air	☐ 20
bailed only	☐ 10
pumped only	☐ 51
pumped slowly	☐ 50
Other _____	☐

3. Time spent developing well 90 min.

4. Depth of well (from top of well casisng) 24.6 ft.

5. Inside diameter of well 2.00 in.

6. Volume of water in filter pack and well casing ____.__ gal.

7. Volume of water removed from well 30.00 gal.

8. Volume of water added (if any) ____.__ gal.

9. Source of water added _____

10. Analysis performed on water added? (If yes, attach results) ☐ Yes ☐ No

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 13.72 ft.	8.53 ft.
Date	b. 07/02/2019 (m m d d y y y y)	07/30/2019 (m m d d y y y y)
Time	c. 10:__ ☒ a.m. ☐ p.m.	1:__ ☐ a.m. ☒ p.m.
12. Sediment in well bottom	___.__ inches	___.__ inches
13. Water clarity	Clear ☒ 10 Turbid ☐ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)
	pH - 6.9 Temp - 72.3	pH - 7.4 Temp - 74.5

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

16. Well developed by: Name (first, last) and Firm
First Name: Steve Last Name: Tiber
Firm: Environmental Audits, Inc.

17. Additional comments on development:

Name and Address of Facility Contact/Owner/Responsible Party
First Name: _____ Last Name: _____
Facility/Firm: Twin Disc, Inc
Street: 4600 21st St.
City/State/Zip: Racine, WI

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: Steve Tiber
Print Name: Steve Tiber
Firm: Environmental Audits, Inc

NOTE: See instructions for more information including a list of county codes and well type codes.

State of Wisconsin
Department of Natural Resources

INSTRUCTIONS
Monitoring Well Construction Form 4400-113A

General Instructions: Fill out both a monitoring well construction form (4400-113A) and a monitoring well development form (4400-113B) for each well installed. Sign each form. Please note that these forms are subject to change. (Personally identifiable information on these forms is not intended to be used for any other purpose.)

Routing: Return these forms to the project manager or plan reviewer for the DNR program who required the well installation. If the project manager/plan reviewer is in the Regional Office, send the original forms to the Regional Office and a copy to the Central Office in Madison. If the project manager/plan reviewer is in the Central Office, send the original forms there and a copy to the Regional Office. If your project does not have a project manager or plan reviewer or you don't know who it is, send the forms to the appropriate program in the Central Office. The addresses of the DNR offices are provided on the attached map.

Check the appropriate routing box at the top of the forms to assure proper routing once the forms reach DNR.

Time-saving tip: When filling out many forms at once, you can save time by using a photocopier. Fill out one form (the "original") with any information that is the same for all wells, such as facility name, section location, grid origin location, drilling method and well casing type. Photocopy both sides of the "original", making as many copies as there are wells. On the separate copies, fill in the details that are unique for each well.

TOP LEFT

Facility/Project Name: Fill in the name of landfill, wastewater treatment facility, surface impoundment, spill or project.

Facility License, Permit, or Monitoring Number: Fill in number assigned to facility by the Department. If unknown, leave blank.

Facility ID: Fill in the nine digit Facility ID (FID) assigned to the site.

Type of Well: Record the type of well code (number/initials) from the following list:

11/mw Water table observation well (monitoring well screen intersecting the water table) (non Subtitle D well)
12/pz Piezometer (monitoring well with screen sealed below the water table) (non Subtitle D well)
17/gc Gradient control
18/at Aquifer test
24/lh Leachate head well
26/ew Groundwater extraction well
27/he Horizontal groundwater extraction well
28/hw Horizontal monitoring well
29/ha Horizontal vapor extraction well
51/gp Gas probe
53/ge Gas extraction well
57/sv Soil venting wells (includes both soil vapor extraction and bioventing, includes both extraction and unsaturated zone gas phase injection wells installed in soil or fill, but not refuse
61/ij Injection well (injection of liquids not gases)
62/as In situ air sparging well (injection well to inject gases into the aquifer
63/uv Unterdruck Verdampfer Brunnen (UVB) wells (sparging wells where the gases remain in the well and are not injected into the aquifer)
64/le Groundwater and light non-aqueous phase liquid (LNAPL) extraction wells
65/de Groundwater and dense non-aqueous phase liquid (DNAPL) extraction wells
66/ve Vacuum enhanced groundwater extraction wells
67/vi Vacuum enhanced groundwater and LNAPL extraction wells
68/vd Vacuum enhanced groundwater and DNAPL extraction wells
71/dw Subtitle D water table observation well (see 11/mw above)
72/dp Subtitle D piezometer (see 12/pz above)
99/Ot Other

Distance From Waste/Source: Enter distance in feet from the monitoring well to the edge of a facility waste storage or discharge structure, e.g., from the edge of a wastewater lagoon or the approved waste fill boundary for a landfill. For a contaminant source which is not a facility, e.g., a spill, enter the distance the well is from the contaminant source.

Enf. Stds. Apply: Check this box only if enforcement standards apply at this well. Enforcement standards apply at any well beyond the Design Management Zone or the property boundary of the facility or at a water supply well. For spills, enforcement standards apply at every point at which groundwater is monitored. (For more information, see s. NR 140.22, Wis. Adm. Code.)

TOP CENTER

Local Grid Location: The location of the well to the nearest foot, in relation to the grid origin established for the site. If the exact location of the well is given in State Plane Coordinates, then leave these fields blank.

Local Grid Origin or Well Location: Check the appropriate box behind the Local Grid Origin or the Well Location text. Locate the grid origin at a permanent feature near the waste or source of contamination. Give the location in State Plane Coordinates or Latitude and Longitude in degrees, minutes and seconds (using 1927 North American Datum). If State Plane Coordinates are used, circle the appropriate letter for south, central or north zone. Alternately, an acceptable method for providing this information without surveying is to locate the Grid Origin on a USGS 7.5 minute quadrangle map. The Location of the Grid Origin can then be interpolated (estimated) using standard cartographic techniques. If the Grid Origin location is estimated, check the estimated box.

The Well Location can be determined directly by surveying or by Global Positioning System (GPS) (with processing to be accurate within 1 foot and reported with precision to hundredths of a second). If the exact location of the well is given in State Plane Coordinates, then leave the Local Grid Location fields blank.

Section Location of Waste/Source: Fill in the quarter quarter and quarter section, section, township, range and range direction of the waste or source.

Location of Well Relative to Waste/Source: Check the box which describes the location of the well in the groundwater flow system relative to the disposal site, spill, etc. If groundwater flow directions are unknown, check "not known."

Gov. Lot Number: Provide the government lot number for the property if applicable. (Government lot numbers are the legal description of a tract of land adjacent to a lake or stream where a proper quarter or quarter quarter section corner could not be established.)

TOP RIGHT

Well Name: Fill in common well name, such as B-11, OW-13A, or MW-5R. (Use the suffix "R" for a replacement well.)

Wis. Unique Well Number: Fill in the 2 alphabetic and 3 numeric Wisconsin Unique Well Number (WUWN) on this form. In addition, attach the WUWN tag to the inside of the protective cover pipe and record that number on the Soil Boring Log Information form 4400-122 and Monitoring Well Development form 4400-113B. WUWN tags are available from the DNR Central or Regional Offices.

DNR Well ID Number: The 3 digit number assigned to the well by the Department.

Date Well Installed: List Month/Day/Year (mm/dd/yyyy) the well was installed.

Well Installed By: Fill in name (first and last) and firm of the person who supervised the drilling. The person must be a hydrogeologist, a drilling crew chief or experienced engineering technician.

LEFT SIDE

Numerical Specifications: Fill in data for letters A through N which refer to design elements on the figure on the form. Letters A, B and C must be reported as elevations in feet above mean sea level (MSL), surveyed to the nearest 0.01 foot. Letters D through K may be either elevation above MSL or depth below land surface, accurate to the nearest 0.1 foot.

A. **Protective pipe, top elevation.** With cap off. Referenced to Mean Sea Level (MSL).

B. **Well casing, top elevation.** With cap off. Referenced to MSL.

C. **Land surface elevation.** Referenced to MSL.

D. **Surface seal, bottom.** Fill in elevation, MSL or depth below land surface.

E. **Bentonite seal, top.** MSL or depth below land surface. (See NR 141.13(1) to determine if this seal is required)

F. **Fine sand, top.** MSL or depth below land surface. Cross out if not installed.

G. **Filter pack, top**. MSL or depth below land surface.

H. **Screen joint, top**. MSL or depth below land surface. (Top of the entire screen section, NOT the top slot)

L. **Well bottom**. MSL or depth below land surface.

J. **Filter pack, bottom**. MSL or depth below land surface.

K. **Borehole, bottom**. MSL or depth below land surface.

L. **Borehole, diameter**: Diameter to nearest 0.1 inch.

M. **O.D. well casing**: Outside diameter to nearest 0.01 inch.

N. **I.D. well casing**: Inside diameter to nearest 0.01 inch.

LEFT CENTER INSERT (BOX)

12. **USCS classification of soil near screen**: Check boxes for all soil types (or bedrock) found at the depths spanned by the well screen, using the Unified Soil Classification System symbols. Refer to the native soil near the screen, not to the filter pack material.

13. **Sieve analysis performed?**: Check box. A sieve analysis for soil near the screen is required for all wells.

14. **Drilling method used**: Choose from among the choices on the form or check "Other" and write in one of the choices below:

Reverse rotary	Solid stem auger	Cable tool	Driven point
Vibratory	Casing hammer	Wash boring	

15. **Drilling fluid used**: Check appropriate box or boxes.

16. **Drilling additives used**: Check box. If yes, describe.

17. **Source of water**: Cite source(s) of any water used to drill the well OR to hydrate dry bentonite OR to mix annular space sealant. Cite exact source so that a sample of the water can be obtained later, if necessary. If the well is at a solid waste facility, attach an analysis of the water according to s. NR 507.06(1), Wis. Adm. Code.

RIGHT SIDE

1. **Cap and Lock**: Check box.

2. **Protective pipe**: Provide the information below.

   a. **Inside diameter**: Give to nearest 0.1 inch.
   b. **Length**: Give to nearest 0.1 foot
   c. **Material**: Check box. If "Other", describe.
   d. **Additional protection?**: Check box. If 'Yes', describe.

3. **Surface seal**: Check box for the material used to prevent surface water from entering the borehole. If "Other," describe.

4. **Material between well casing and protective pipe**: Check box. If "Other", describe.

5. **Annular space seal**: Check boxes for both materials used and how installed, and fill in volume used.

   Material: If dry bentonite, list source of water used for hydration on line #17. For wells installed at a solid waste site, attach an analysis of water (see s. NR 507.06(1), Wis. Adm. Code.) For other choices, fill in pounds per gallon mud weight or percent bentonite as appropriate.

   e. **Volume**: Fill in volume used in cubic feet.
   f. **How installed**: Check box for how the annular space seal was installed. If dropped from the land surface, check "Gravity."

6. **Bentonite seal**: If bentonite pellets were used, also check the pellet diameter. If material installed was the same as the annular space seal, or if no filter pack seal was installed, write "none."

7. **Fine sand material**: Fine sand is used to prevent migration of annular space seal material into the filter pack.
   a. Indicate manufacturer, product name, and mesh size.
   b. Indicate volume added.

8. **Filter pack material**: General description of filter pack material, e.g., "430 grit sand," and name of filter pack manufacturer, product name or number, and volume added. Attach grain size analysis of filter pack and state quantity used.

9. **Well casing**: Check box for PVC type. If "Other", describe. Examples of "Other" include stainless steel, steel, and Teflon ©.

10. **Screen material**: If same as well casing, write "same."

    a. **Screen type**: Check box. If "Other", describe the design.
    b. **Manufacturer**: List name of manufacturer.
    c. **Slot size**: Give width of slot in thousandths (0.001) of an inch.
    d. **Slotted length**: Give distance from top slot to bottom slot to nearest 0.1 foot.

11. **Backfill material**: Check "None" or, if "Other", describe any backfill installed below the filter pack.

FAR BOTTOM

"I hereby certify that the information on this form is true and correct to the best of my knowledge.": Sign the form and indicate name of firm.

MONITORING WELL DEVELOPMENT FORM 4400-113B

TOP TWO LINES

Facility/Project Name: Fill in the name of landfill, wastewater treatment facility, surface impoundment, spill or project.

Facility License Permit, or Monitoring Number: Enter number assigned to facility by the DNR. If unknown, leave blank.

County Name: Fill in the name of the county in which the well is installed.

County Code: Fill in the two digit county code number.

1 . Adams	16. Douglas	31. Kewaunee	46. Ozaukee	61. Taylor
2. Ashland	17. Dunn	32. La Crosse	47. Pepin	62. Trempealeau
3. Barron	18. Eau Claire	33. Lafayette	48. Pierce	63. Vernon
4. Bayfield	19. Florence	34. Langlade	49. Polk	64. Vilas
5. Brown	20. Fond Du Lac	35. Lincoln	50. Portage	65. Walworth
6. Buffalo	21. Forest	36. Manitowoc	51. Price	66. Washburn
7. Burnett	22. Grant	37. Marathon	52. Racine	67. Washington
8. Calumet	23. Green	38. Marinette	53. Richland	68. Waukesha
9. Chippewa	24. Green Lake	39. Marquette	54. Rock	69. Waupaca
10. Clark	25. Iowa	40. Menominee	55. Rusk	70. Waushara
11. Columbia	26. Iron	41. Mlwaukee	56. St. Croix	71. Winnebago
12. Crawford	27. Jackson	42. Monroe	57. Sauk	72. Wood
13. Dane	28 Jefferson	43. Oconto	58. Sawyer	
14. Dodge	29. Juneau	44. Oneida	59. Shawano	
15. Door	30. Kenosha	45. Outagamie	60. Sheboygan	

Well Name: Fill in common well name, such as P-11, OW-13A, or MW-5R. (Use the suffix "R" for a replacement well.)

Wis. Unique Well Number: Record the Wisconsin Unique Well Number assigned to the well.

DNR Well ID Number: The 3 digit number assigned to the well by the Department.

LEFT COLUMN

1. **Can this well be purged dry?** Check whether well can or cannot be purged dry (all water removed).

2. **Well development method**: Check appropriate box. If "Other", describe. Note that a well shall be surged and purged for a minimum of 30 minutes.

3. **Time spent developing well**: In minutes.

4. **Depth of well**: In tenths (0.1) of feet, from top of well casing.

5. **Inside diameter of well**: In hundredths (0.01) of inches.

6. **Volume of water in filter pack and well casing**: In tenths (0.1) of gallons.

7. **Volume of water removed from well**: In tenths (0.1) of gallons.

8. **Volume of water added, if any**: In tenths (0.1) of gallons.

9. **Source of water added**: Cite exact source so that a sample of the water can be obtained later, if necessary.

10. **Analysis performed on water added?** Check appropriate box. If well is installed at a solid waste facility, attach analysis of water according to s. NR 507.06(1), Wis. Adm. Code.

RIGHT COLUMN

11. **Depth to water**:

    a. Enter distance from top of well casing to water level in well, in hundredths (0.01) of a foot, both before and after development.

    b. **Date**: Enter month/day/year (mm/dd/yyyy) development began and ended.

    c. **Time**: Enter according to a twelve hour clock the time development began and ended.

12. **Sediment in well bottom**: Compute to tenths (0.1) of inches, both before and after development.

13. **Water clarity**: Check box and describe.

14. **Total suspended solids**: Total Suspended Solids, as determined by a certified or registered analytical laboratory. Required only for wells near solid waste facilities when drilling fluids were used.

15. **COD**: Chemical oxygen demand, as determined by a certified or registered analytical laboratory. Required only for wells near solid waste facilities when drilling fluids were used.

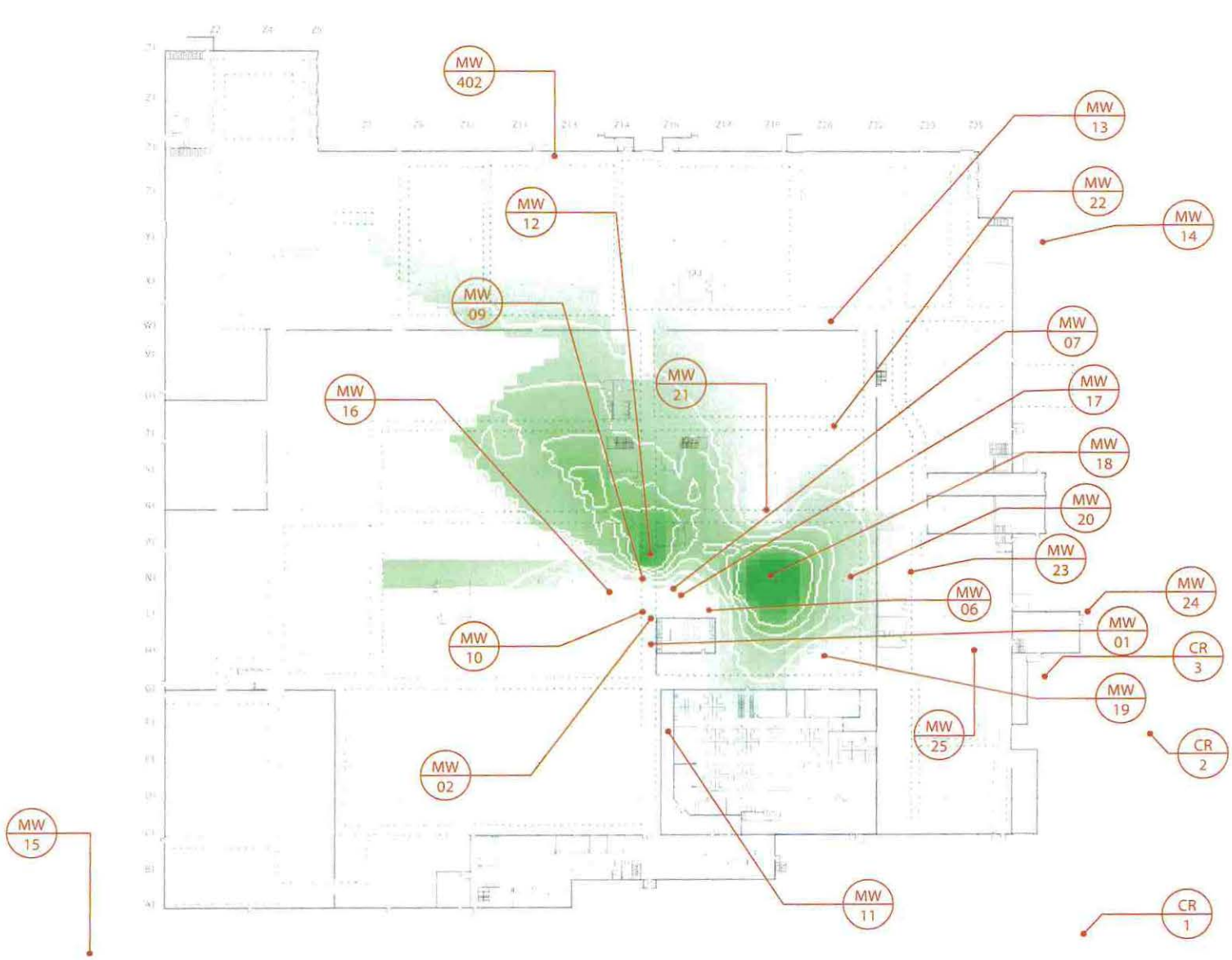
16. **Well developed by**: Enter the name (first and last) and firm of the person who supervised the development This person must be a hydrogeologist, the drilling crew chief, or an experienced engineering technician.

BOTTOM SECTION

17. **Additional comments on development**: Describe any of the above in more detail or add information such as the relative recovery rates of wells or the amount of drilling fluid lost to the formation and the amount of water removed to account for lost drilling fluid. For example, if 150 gallons of drilling water were, lost, you should remove the volume of water in the filter pack and well casing plus 150 gallons as part of development.

Name and Address of Facility/Owner/Responsible Party Contact: Enter a contact name (first and last), or a firm name or facility name, street address, city, state, and zip code of the facility or site.

Signature, Print Name, and Firm: Signature and printed name of the person filling out the form and name of firm for which the person works.



N
W E
S

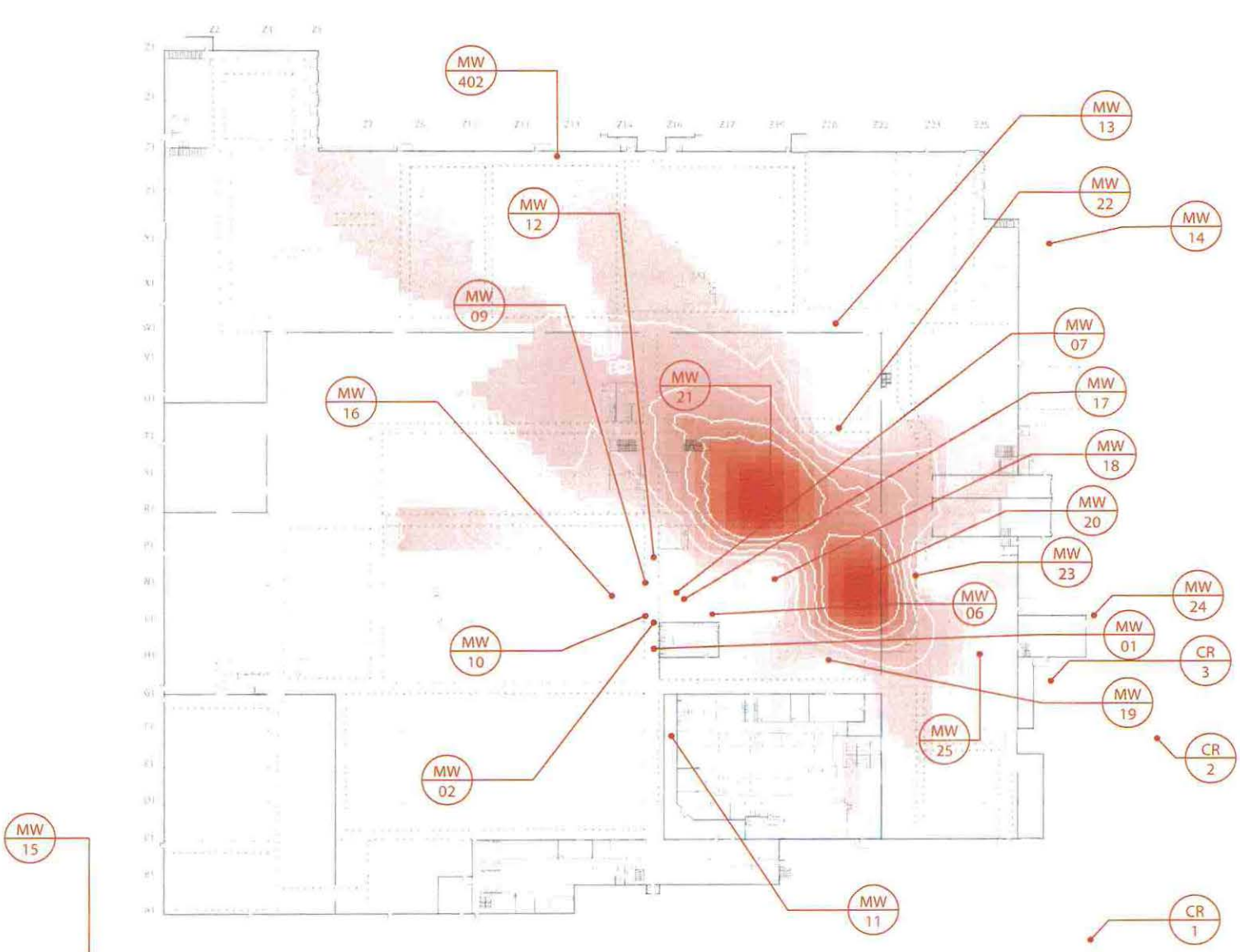
APPROXIMATE SCALE:
1" = 85'

DRO Level Measured in mg/l

0
600
1200
1800
2400
3000
3600
4200
4800
5400

Twin Disc, Inc.
Broach Pit Project
2D - DRO Level Map
Plant 3 - Level 1
Drawn on 05/16/15

Environmental Audits technical management group



N
W E
S

APPROXIMATE SCALE:
1" = 85'

Product Level Measured in Inches

0
4
8
12
16
20
24
28
32
36

Twin Disc, Inc.

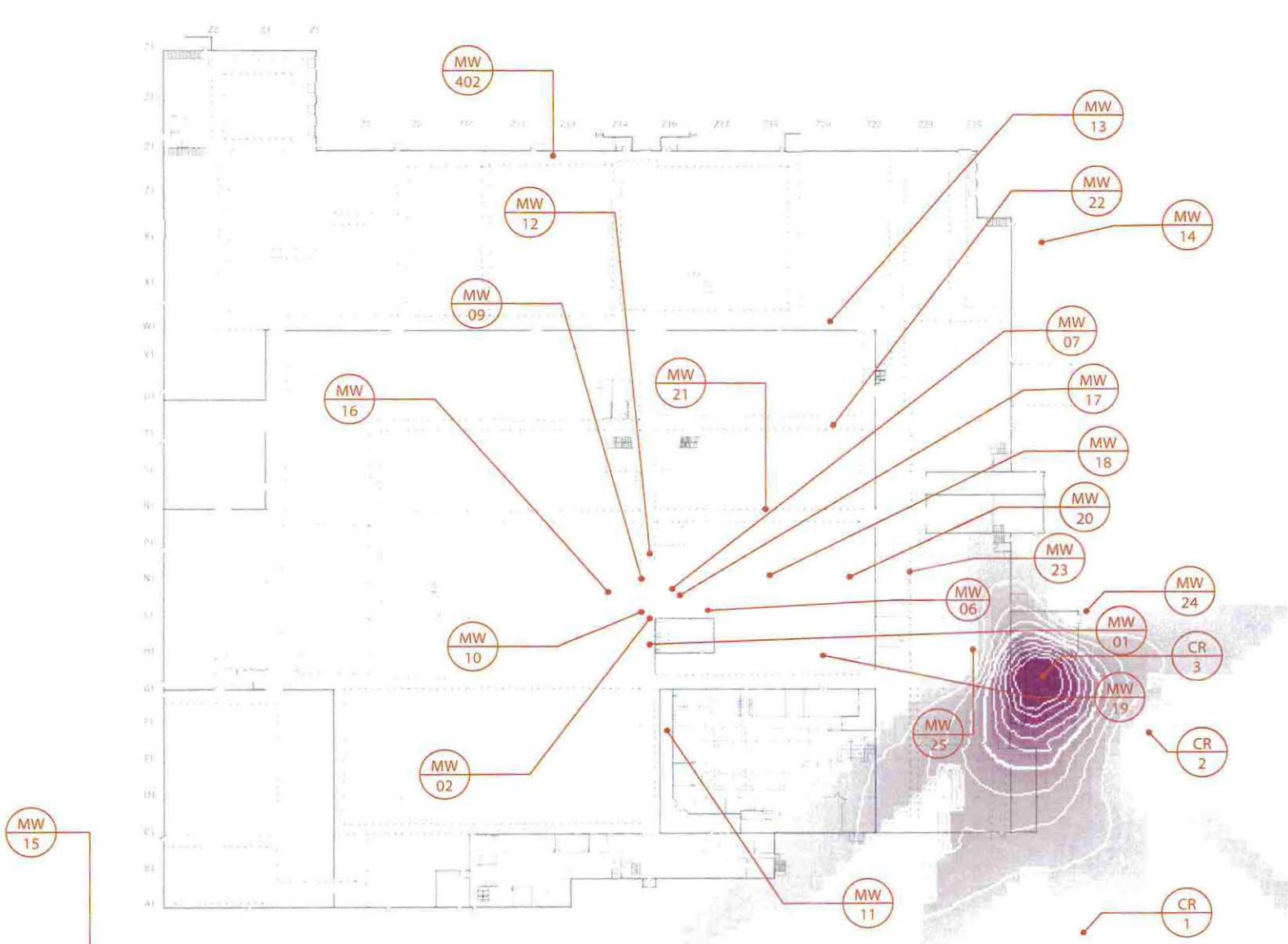
Broach Pit Project

2D - Product Level Map

Plant 3 - Level 1

Drawn on 07/20/16

Environmental Audits technical management group



N
W E
S

APPROXIMATE SCALE:
1" = 85'

VOC Level Measured in ug/l

0
20000
40000
60000
80000
1e+05
1.2e+05
1.4e+05
1.6e+05
1.8e+05
2e+05

Twin Disc, Inc.

Broach Pit Project

2D - VOC Level Map

Plant 3 - Level 1

Drawn on 07/20/16

Environmental Audits technical management group

APPENDIX II: Laboratory Reports

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

March 11, 2020

John Ruetz
Environmental Audits Inc
11327 W Lincoln Ave
West Allis, WI 53227

RE: Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Dear John Ruetz:
Enclosed are the analytical results for sample(s) received by the laboratory on March 07, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Ed Raymond, Environmental Audits, Inc
Steve Tiber, Environmental Audits Inc.
Stephanie Wagner, Environmental Audits, Inc.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40204401001	MW-1	Water	03/05/20 13:00	03/07/20 08:45
40204401002	MW-2	Water	03/05/20 13:00	03/07/20 08:45
40204401003	MW-6	Water	03/05/20 13:00	03/07/20 08:45
40204401004	MW-7	Water	03/05/20 13:00	03/07/20 08:45
40204401005	MW-9	Water	03/05/20 13:00	03/07/20 08:45
40204401006	MW-10	Water	03/05/20 13:00	03/07/20 08:45
40204401007	MW-12	Water	03/05/20 13:00	03/07/20 08:45
40204401008	MW-25	Water	03/05/20 13:00	03/07/20 08:45

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40204401001	MW-1	EPA 8260	LAP	64
40204401002	MW-2	EPA 8260	LAP	64
40204401003	MW-6	EPA 8260	LAP	64
40204401004	MW-7	EPA 8260	LAP	64
40204401005	MW-9	EPA 8260	LAP	64
40204401006	MW-10	EPA 8260	LAP	64
40204401007	MW-12	EPA 8260	LAP	64
40204401008	MW-25	EPA 8260	LAP	64

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-1 **Lab ID: 40204401001** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		03/10/20 17:23	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		03/10/20 17:23	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 17:23	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		03/10/20 17:23	79-00-5	
1,1-Dichloroethane	**34.4**	ug/L	1.0	0.27	1		03/10/20 17:23	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 17:23	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		03/10/20 17:23	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		03/10/20 17:23	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		03/10/20 17:23	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		03/10/20 17:23	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		03/10/20 17:23	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		03/10/20 17:23	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		03/10/20 17:23	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 17:23	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 17:23	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 17:23	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		03/10/20 17:23	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		03/10/20 17:23	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		03/10/20 17:23	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		03/10/20 17:23	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		03/10/20 17:23	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		03/10/20 17:23	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		03/10/20 17:23	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		03/10/20 17:23	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 17:23	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		03/10/20 17:23	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		03/10/20 17:23	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		03/10/20 17:23	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		03/10/20 17:23	74-83-9	
Carbon tetrachloride	**<1.6**	ug/L	5.5	1.6	1		03/10/20 17:23	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 17:23	108-90-7	
Chloroethane	**8.2**	ug/L	5.0	1.3	1		03/10/20 17:23	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		03/10/20 17:23	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		03/10/20 17:23	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		03/10/20 17:23	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		03/10/20 17:23	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		03/10/20 17:23	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		03/10/20 17:23	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		03/10/20 17:23	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		03/10/20 17:23	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		03/10/20 17:23	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		03/10/20 17:23	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		03/10/20 17:23	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		03/10/20 17:23	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		03/10/20 17:23	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		03/10/20 17:23	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-1 **Lab ID: 40204401001** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.27**	ug/L	0.90	0.27	1		03/10/20 17:23	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 17:23	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		03/10/20 17:23	75-69-4	
Vinyl chloride	**1.8**	ug/L	1.0	0.17	1		03/10/20 17:23	75-01-4	
cis-1,2-Dichloroethene	**0.40J**	ug/L	1.0	0.27	1		03/10/20 17:23	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		03/10/20 17:23	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		03/10/20 17:23	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 17:23	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		03/10/20 17:23	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 17:23	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		03/10/20 17:23	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		03/10/20 17:23	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		03/10/20 17:23	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		03/10/20 17:23	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		03/10/20 17:23	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	96	%	70-130		1		03/10/20 17:23	460-00-4	
Dibromofluoromethane (S)	94	%	70-130		1		03/10/20 17:23	1868-53-7	
Toluene-d8 (S)	95	%	70-130		1		03/10/20 17:23	2037-26-5	

Sample: MW-2 **Lab ID: 40204401002** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<1.3**	ug/L	5.0	1.3	5		03/10/20 08:07	630-20-6	
1,1,1-Trichloroethane	**<1.2**	ug/L	5.0	1.2	5		03/10/20 08:07	71-55-6	
1,1,2,2-Tetrachloroethane	**<1.4**	ug/L	5.0	1.4	5		03/10/20 08:07	79-34-5	
1,1,2-Trichloroethane	**<2.8**	ug/L	25.0	2.8	5		03/10/20 08:07	79-00-5	
1,1-Dichloroethane	**14.6**	ug/L	5.0	1.4	5		03/10/20 08:07	75-34-3	
1,1-Dichloroethene	**<1.2**	ug/L	5.0	1.2	5		03/10/20 08:07	75-35-4	
1,1-Dichloropropene	**<2.7**	ug/L	9.0	2.7	5		03/10/20 08:07	563-58-6	
1,2,3-Trichlorobenzene	**<11.1**	ug/L	36.8	11.1	5		03/10/20 08:07	87-61-6	
1,2,3-Trichloropropane	**<3.0**	ug/L	25.0	3.0	5		03/10/20 08:07	96-18-4	
1,2,4-Trichlorobenzene	**<4.8**	ug/L	25.0	4.8	5		03/10/20 08:07	120-82-1	
1,2,4-Trimethylbenzene	**<4.2**	ug/L	14.0	4.2	5		03/10/20 08:07	95-63-6	
1,2-Dibromo-3-chloropropane	**<8.8**	ug/L	29.4	8.8	5		03/10/20 08:07	96-12-8	
1,2-Dibromoethane (EDB)	**<4.1**	ug/L	13.8	4.1	5		03/10/20 08:07	106-93-4	
1,2-Dichlorobenzene	**<3.5**	ug/L	11.8	3.5	5		03/10/20 08:07	95-50-1	
1,2-Dichloroethane	**<1.4**	ug/L	5.0	1.4	5		03/10/20 08:07	107-06-2	
1,2-Dichloropropane	**<1.4**	ug/L	5.0	1.4	5		03/10/20 08:07	78-87-5	
1,3,5-Trimethylbenzene	**<4.4**	ug/L	14.6	4.4	5		03/10/20 08:07	108-67-8	
1,3-Dichlorobenzene	**<3.1**	ug/L	10.5	3.1	5		03/10/20 08:07	541-73-1	
1,3-Dichloropropane	**<4.1**	ug/L	13.8	4.1	5		03/10/20 08:07	142-28-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-2 **Lab ID: 40204401002** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<4.7**	ug/L	15.7	4.7	5		03/10/20 08:07	106-46-7	
2,2-Dichloropropane	**<11.3**	ug/L	37.8	11.3	5		03/10/20 08:07	594-20-7	
2-Chlorotoluene	**<4.6**	ug/L	25.0	4.6	5		03/10/20 08:07	95-49-8	
4-Chlorotoluene	**<3.8**	ug/L	12.6	3.8	5		03/10/20 08:07	106-43-4	
Benzene	**<1.2**	ug/L	5.0	1.2	5		03/10/20 08:07	71-43-2	
Bromobenzene	**<1.2**	ug/L	5.0	1.2	5		03/10/20 08:07	108-86-1	
Bromochloromethane	**<1.8**	ug/L	25.0	1.8	5		03/10/20 08:07	74-97-5	
Bromodichloromethane	**<1.8**	ug/L	6.1	1.8	5		03/10/20 08:07	75-27-4	
Bromoform	**<19.9**	ug/L	66.2	19.9	5		03/10/20 08:07	75-25-2	
Bromomethane	**<4.9**	ug/L	25.0	4.9	5		03/10/20 08:07	74-83-9	
Carbon tetrachloride	**<8.2**	ug/L	27.3	8.2	5		03/10/20 08:07	56-23-5	
Chlorobenzene	**<3.6**	ug/L	11.8	3.6	5		03/10/20 08:07	108-90-7	
Chloroethane	**<6.7**	ug/L	25.0	6.7	5		03/10/20 08:07	75-00-3	
Chloroform	**<6.4**	ug/L	25.0	6.4	5		03/10/20 08:07	67-66-3	
Chloromethane	**<10.9**	ug/L	36.5	10.9	5		03/10/20 08:07	74-87-3	
Dibromochloromethane	**<13.0**	ug/L	43.4	13.0	5		03/10/20 08:07	124-48-1	
Dibromomethane	**<4.7**	ug/L	15.6	4.7	5		03/10/20 08:07	74-95-3	
Dichlorodifluoromethane	**<2.5**	ug/L	25.0	2.5	5		03/10/20 08:07	75-71-8	
Diisopropyl ether	**<9.4**	ug/L	31.5	9.4	5		03/10/20 08:07	108-20-3	
Ethylbenzene	**<1.6**	ug/L	5.3	1.6	5		03/10/20 08:07	100-41-4	
Hexachloro-1,3-butadiene	**<7.3**	ug/L	24.4	7.3	5		03/10/20 08:07	87-68-3	
Isopropylbenzene (Cumene)	**<8.4**	ug/L	28.1	8.4	5		03/10/20 08:07	98-82-8	
Methyl-tert-butyl ether	**<6.2**	ug/L	20.8	6.2	5		03/10/20 08:07	1634-04-4	
Methylene Chloride	**<2.9**	ug/L	25.0	2.9	5		03/10/20 08:07	75-09-2	
Naphthalene	**<5.9**	ug/L	25.0	5.9	5		03/10/20 08:07	91-20-3	
Styrene	**<15.0**	ug/L	50.2	15.0	5		03/10/20 08:07	100-42-5	
Tetrachloroethene	**<1.6**	ug/L	5.4	1.6	5		03/10/20 08:07	127-18-4	
Toluene	**<1.3**	ug/L	4.5	1.3	5		03/10/20 08:07	108-88-3	
Trichloroethene	**<1.3**	ug/L	5.0	1.3	5		03/10/20 08:07	79-01-6	
Trichlorofluoromethane	**<1.1**	ug/L	5.0	1.1	5		03/10/20 08:07	75-69-4	
Vinyl chloride	**<0.87**	ug/L	5.0	0.87	5		03/10/20 08:07	75-01-4	
cis-1,2-Dichloroethene	**<1.4**	ug/L	5.0	1.4	5		03/10/20 08:07	156-59-2	
cis-1,3-Dichloropropene	**<18.1**	ug/L	60.5	18.1	5		03/10/20 08:07	10061-01-5	
m&p-Xylene	**<2.3**	ug/L	10.0	2.3	5		03/10/20 08:07	179601-23-1	
n-Butylbenzene	**<3.5**	ug/L	11.8	3.5	5		03/10/20 08:07	104-51-8	
n-Propylbenzene	**<4.1**	ug/L	25.0	4.1	5		03/10/20 08:07	103-65-1	
o-Xylene	**<1.3**	ug/L	5.0	1.3	5		03/10/20 08:07	95-47-6	
p-Isopropyltoluene	**<4.0**	ug/L	13.3	4.0	5		03/10/20 08:07	99-87-6	
sec-Butylbenzene	**<4.2**	ug/L	25.0	4.2	5		03/10/20 08:07	135-98-8	
tert-Butylbenzene	**<1.5**	ug/L	5.1	1.5	5		03/10/20 08:07	98-06-6	
trans-1,2-Dichloroethene	**<5.5**	ug/L	18.2	5.5	5		03/10/20 08:07	156-60-5	
trans-1,3-Dichloropropene	**<21.9**	ug/L	72.8	21.9	5		03/10/20 08:07	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	96	%	70-130		5		03/10/20 08:07	460-00-4	D3
Dibromofluoromethane (S)	98	%	70-130		5		03/10/20 08:07	1868-53-7	
Toluene-d8 (S)	93	%	70-130		5		03/10/20 08:07	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-6 **Lab ID: 40204401003** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		03/10/20 17:47	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		03/10/20 17:47	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 17:47	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		03/10/20 17:47	79-00-5	
1,1-Dichloroethane	**93.7**	ug/L	1.0	0.27	1		03/10/20 17:47	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 17:47	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		03/10/20 17:47	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		03/10/20 17:47	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		03/10/20 17:47	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		03/10/20 17:47	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		03/10/20 17:47	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		03/10/20 17:47	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		03/10/20 17:47	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 17:47	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 17:47	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 17:47	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		03/10/20 17:47	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		03/10/20 17:47	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		03/10/20 17:47	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		03/10/20 17:47	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		03/10/20 17:47	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		03/10/20 17:47	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		03/10/20 17:47	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		03/10/20 17:47	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 17:47	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		03/10/20 17:47	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		03/10/20 17:47	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		03/10/20 17:47	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		03/10/20 17:47	74-83-9	
Carbon tetrachloride	**<1.6**	ug/L	5.5	1.6	1		03/10/20 17:47	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 17:47	108-90-7	
Chloroethane	**4.2J**	ug/L	5.0	1.3	1		03/10/20 17:47	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		03/10/20 17:47	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		03/10/20 17:47	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		03/10/20 17:47	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		03/10/20 17:47	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		03/10/20 17:47	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		03/10/20 17:47	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		03/10/20 17:47	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		03/10/20 17:47	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		03/10/20 17:47	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		03/10/20 17:47	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		03/10/20 17:47	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		03/10/20 17:47	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		03/10/20 17:47	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		03/10/20 17:47	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-6 **Lab ID: 40204401003** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.27**	ug/L	0.90	0.27	1		03/10/20 17:47	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 17:47	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		03/10/20 17:47	75-69-4	
Vinyl chloride	**0.93J**	ug/L	1.0	0.17	1		03/10/20 17:47	75-01-4	
cis-1,2-Dichloroethene	**1.2**	ug/L	1.0	0.27	1		03/10/20 17:47	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		03/10/20 17:47	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		03/10/20 17:47	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 17:47	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		03/10/20 17:47	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 17:47	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		03/10/20 17:47	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		03/10/20 17:47	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		03/10/20 17:47	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		03/10/20 17:47	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		03/10/20 17:47	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	98	%	70-130		1		03/10/20 17:47	460-00-4	
Dibromofluoromethane (S)	92	%	70-130		1		03/10/20 17:47	1868-53-7	
Toluene-d8 (S)	97	%	70-130		1		03/10/20 17:47	2037-26-5	

Sample: MW-7 **Lab ID: 40204401004** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		03/10/20 16:12	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:12	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:12	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		03/10/20 16:12	79-00-5	
1,1-Dichloroethane	**1.3**	ug/L	1.0	0.27	1		03/10/20 16:12	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:12	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		03/10/20 16:12	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		03/10/20 16:12	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		03/10/20 16:12	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		03/10/20 16:12	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		03/10/20 16:12	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		03/10/20 16:12	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		03/10/20 16:12	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:12	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:12	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:12	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		03/10/20 16:12	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		03/10/20 16:12	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		03/10/20 16:12	142-28-9	

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-7 **Lab ID: 40204401004** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		03/10/20 16:12	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		03/10/20 16:12	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		03/10/20 16:12	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		03/10/20 16:12	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		03/10/20 16:12	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:12	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		03/10/20 16:12	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		03/10/20 16:12	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		03/10/20 16:12	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		03/10/20 16:12	74-83-9	
Carbon tetrachloride	**<1.6**	ug/L	5.5	1.6	1		03/10/20 16:12	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:12	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		03/10/20 16:12	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		03/10/20 16:12	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		03/10/20 16:12	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		03/10/20 16:12	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		03/10/20 16:12	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		03/10/20 16:12	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		03/10/20 16:12	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		03/10/20 16:12	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		03/10/20 16:12	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		03/10/20 16:12	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		03/10/20 16:12	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		03/10/20 16:12	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		03/10/20 16:12	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		03/10/20 16:12	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		03/10/20 16:12	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		03/10/20 16:12	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 16:12	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		03/10/20 16:12	75-69-4	
Vinyl chloride	**1.3**	ug/L	1.0	0.17	1		03/10/20 16:12	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		03/10/20 16:12	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		03/10/20 16:12	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		03/10/20 16:12	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:12	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		03/10/20 16:12	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 16:12	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		03/10/20 16:12	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		03/10/20 16:12	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		03/10/20 16:12	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		03/10/20 16:12	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		03/10/20 16:12	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%	70-130		1		03/10/20 16:12	460-00-4	
Dibromofluoromethane (S)	101	%	70-130		1		03/10/20 16:12	1868-53-7	
Toluene-d8 (S)	97	%	70-130		1		03/10/20 16:12	2037-26-5	

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-9 **Lab ID: 40204401005** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		03/10/20 16:35	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:35	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:35	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		03/10/20 16:35	79-00-5	
1,1-Dichloroethane	**1.6**	ug/L	1.0	0.27	1		03/10/20 16:35	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:35	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		03/10/20 16:35	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		03/10/20 16:35	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		03/10/20 16:35	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		03/10/20 16:35	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		03/10/20 16:35	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		03/10/20 16:35	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		03/10/20 16:35	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:35	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:35	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:35	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		03/10/20 16:35	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		03/10/20 16:35	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		03/10/20 16:35	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		03/10/20 16:35	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		03/10/20 16:35	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		03/10/20 16:35	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		03/10/20 16:35	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		03/10/20 16:35	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:35	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		03/10/20 16:35	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		03/10/20 16:35	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		03/10/20 16:35	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		03/10/20 16:35	74-83-9	
Carbon tetrachloride	**<1.6**	ug/L	5.5	1.6	1		03/10/20 16:35	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:35	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		03/10/20 16:35	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		03/10/20 16:35	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		03/10/20 16:35	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		03/10/20 16:35	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		03/10/20 16:35	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		03/10/20 16:35	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		03/10/20 16:35	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		03/10/20 16:35	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		03/10/20 16:35	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		03/10/20 16:35	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		03/10/20 16:35	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		03/10/20 16:35	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		03/10/20 16:35	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		03/10/20 16:35	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		03/10/20 16:35	127-18-4	

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-9 **Lab ID: 40204401005** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.27**	ug/L	0.90	0.27	1		03/10/20 16:35	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 16:35	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		03/10/20 16:35	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		03/10/20 16:35	75-01-4	
cis-1,2-Dichloroethene	**0.84J**	ug/L	1.0	0.27	1		03/10/20 16:35	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		03/10/20 16:35	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		03/10/20 16:35	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:35	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		03/10/20 16:35	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 16:35	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		03/10/20 16:35	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		03/10/20 16:35	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		03/10/20 16:35	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		03/10/20 16:35	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		03/10/20 16:35	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	95	%	70-130		1		03/10/20 16:35	460-00-4	
Dibromofluoromethane (S)	101	%	70-130		1		03/10/20 16:35	1868-53-7	
Toluene-d8 (S)	97	%	70-130		1		03/10/20 16:35	2037-26-5	

Sample: MW-10 **Lab ID: 40204401006** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.54**	ug/L	2.0	0.54	2		03/11/20 07:13	630-20-6	
1,1,1-Trichloroethane	**<0.49**	ug/L	2.0	0.49	2		03/11/20 07:13	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.55**	ug/L	2.0	0.55	2		03/11/20 07:13	79-34-5	
1,1,2-Trichloroethane	**<1.1**	ug/L	10.0	1.1	2		03/11/20 07:13	79-00-5	
1,1-Dichloroethane	**1.6J**	ug/L	2.0	0.55	2		03/11/20 07:13	75-34-3	
1,1-Dichloroethene	**<0.49**	ug/L	2.0	0.49	2		03/11/20 07:13	75-35-4	
1,1-Dichloropropene	**<1.1**	ug/L	3.6	1.1	2		03/11/20 07:13	563-58-6	
1,2,3-Trichlorobenzene	**<4.4**	ug/L	14.7	4.4	2		03/11/20 07:13	87-61-6	
1,2,3-Trichloropropane	**<1.2**	ug/L	10.0	1.2	2		03/11/20 07:13	96-18-4	
1,2,4-Trichlorobenzene	**<1.9**	ug/L	10.0	1.9	2		03/11/20 07:13	120-82-1	
1,2,4-Trimethylbenzene	**<1.7**	ug/L	5.6	1.7	2		03/11/20 07:13	95-63-6	
1,2-Dibromo-3-chloropropane	**<3.5**	ug/L	11.8	3.5	2		03/11/20 07:13	96-12-8	
1,2-Dibromoethane (EDB)	**<1.7**	ug/L	5.5	1.7	2		03/11/20 07:13	106-93-4	
1,2-Dichlorobenzene	**1.6J**	ug/L	4.7	1.4	2		03/11/20 07:13	95-50-1	
1,2-Dichloroethane	**<0.56**	ug/L	2.0	0.56	2		03/11/20 07:13	107-06-2	
1,2-Dichloropropane	**<0.57**	ug/L	2.0	0.57	2		03/11/20 07:13	78-87-5	
1,3,5-Trimethylbenzene	**<1.7**	ug/L	5.8	1.7	2		03/11/20 07:13	108-67-8	
1,3-Dichlorobenzene	**<1.3**	ug/L	4.2	1.3	2		03/11/20 07:13	541-73-1	
1,3-Dichloropropane	**<1.7**	ug/L	5.5	1.7	2		03/11/20 07:13	142-28-9	

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-10 **Lab ID: 40204401006** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<1.9**	ug/L	6.3	1.9	2		03/11/20 07:13	106-46-7	
2,2-Dichloropropane	**<4.5**	ug/L	15.1	4.5	2		03/11/20 07:13	594-20-7	
2-Chlorotoluene	**<1.9**	ug/L	10.0	1.9	2		03/11/20 07:13	95-49-8	
4-Chlorotoluene	**<1.5**	ug/L	5.0	1.5	2		03/11/20 07:13	106-43-4	
Benzene	**<0.49**	ug/L	2.0	0.49	2		03/11/20 07:13	71-43-2	
Bromobenzene	**<0.48**	ug/L	2.0	0.48	2		03/11/20 07:13	108-86-1	
Bromochloromethane	**<0.72**	ug/L	10.0	0.72	2		03/11/20 07:13	74-97-5	
Bromodichloromethane	**<0.73**	ug/L	2.4	0.73	2		03/11/20 07:13	75-27-4	
Bromoform	**<7.9**	ug/L	26.5	7.9	2		03/11/20 07:13	75-25-2	
Bromomethane	**<1.9**	ug/L	10.0	1.9	2		03/11/20 07:13	74-83-9	
Carbon tetrachloride	**<3.3**	ug/L	10.9	3.3	2		03/11/20 07:13	56-23-5	
Chlorobenzene	**<1.4**	ug/L	4.7	1.4	2		03/11/20 07:13	108-90-7	
Chloroethane	**<2.7**	ug/L	10.0	2.7	2		03/11/20 07:13	75-00-3	
Chloroform	**<2.5**	ug/L	10.0	2.5	2		03/11/20 07:13	67-66-3	
Chloromethane	**<4.4**	ug/L	14.6	4.4	2		03/11/20 07:13	74-87-3	
Dibromochloromethane	**<5.2**	ug/L	17.3	5.2	2		03/11/20 07:13	124-48-1	
Dibromomethane	**<1.9**	ug/L	6.2	1.9	2		03/11/20 07:13	74-95-3	
Dichlorodifluoromethane	**<1.0**	ug/L	10.0	1.0	2		03/11/20 07:13	75-71-8	
Diisopropyl ether	**<3.8**	ug/L	12.6	3.8	2		03/11/20 07:13	108-20-3	
Ethylbenzene	**<0.64**	ug/L	2.1	0.64	2		03/11/20 07:13	100-41-4	
Hexachloro-1,3-butadiene	**<2.9**	ug/L	9.8	2.9	2		03/11/20 07:13	87-68-3	
Isopropylbenzene (Cumene)	**<3.4**	ug/L	11.2	3.4	2		03/11/20 07:13	98-82-8	
Methyl-tert-butyl ether	**<2.5**	ug/L	8.3	2.5	2		03/11/20 07:13	1634-04-4	
Methylene Chloride	**<1.2**	ug/L	10.0	1.2	2		03/11/20 07:13	75-09-2	
Naphthalene	**<2.4**	ug/L	10.0	2.4	2		03/11/20 07:13	91-20-3	
Styrene	**<6.0**	ug/L	20.1	6.0	2		03/11/20 07:13	100-42-5	
Tetrachloroethene	**<0.65**	ug/L	2.2	0.65	2		03/11/20 07:13	127-18-4	
Toluene	**<0.54**	ug/L	1.8	0.54	2		03/11/20 07:13	108-88-3	
Trichloroethene	**<0.51**	ug/L	2.0	0.51	2		03/11/20 07:13	79-01-6	
Trichlorofluoromethane	**<0.43**	ug/L	2.0	0.43	2		03/11/20 07:13	75-69-4	
Vinyl chloride	**142**	ug/L	2.0	0.35	2		03/11/20 07:13	75-01-4	
cis-1,2-Dichloroethene	**<0.54**	ug/L	2.0	0.54	2		03/11/20 07:13	156-59-2	
cis-1,3-Dichloropropene	**<7.3**	ug/L	24.2	7.3	2		03/11/20 07:13	10061-01-5	
m&p-Xylene	**<0.93**	ug/L	4.0	0.93	2		03/11/20 07:13	179601-23-1	
n-Butylbenzene	**<1.4**	ug/L	4.7	1.4	2		03/11/20 07:13	104-51-8	
n-Propylbenzene	**<1.6**	ug/L	10.0	1.6	2		03/11/20 07:13	103-65-1	
o-Xylene	**<0.52**	ug/L	2.0	0.52	2		03/11/20 07:13	95-47-6	
p-Isopropyltoluene	**<1.6**	ug/L	5.3	1.6	2		03/11/20 07:13	99-87-6	
sec-Butylbenzene	**<1.7**	ug/L	10.0	1.7	2		03/11/20 07:13	135-98-8	
tert-Butylbenzene	**<0.61**	ug/L	2.0	0.61	2		03/11/20 07:13	98-06-6	
trans-1,2-Dichloroethene	**3.8J**	ug/L	7.3	2.2	2		03/11/20 07:13	156-60-5	
trans-1,3-Dichloropropene	**<8.7**	ug/L	29.1	8.7	2		03/11/20 07:13	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	96	%	70-130		2		03/11/20 07:13	460-00-4	
Dibromofluoromethane (S)	101	%	70-130		2		03/11/20 07:13	1868-53-7	
Toluene-d8 (S)	94	%	70-130		2		03/11/20 07:13	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-12 **Lab ID: 40204401007** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<1.3**	ug/L	5.0	1.3	5		03/10/20 09:18	630-20-6	
1,1,1-Trichloroethane	**<1.2**	ug/L	5.0	1.2	5		03/10/20 09:18	71-55-6	
1,1,2,2-Tetrachloroethane	**<1.4**	ug/L	5.0	1.4	5		03/10/20 09:18	79-34-5	
1,1,2-Trichloroethane	**<2.8**	ug/L	25.0	2.8	5		03/10/20 09:18	79-00-5	
1,1-Dichloroethane	**<1.4**	ug/L	5.0	1.4	5		03/10/20 09:18	75-34-3	
1,1-Dichloroethene	**<1.2**	ug/L	5.0	1.2	5		03/10/20 09:18	75-35-4	
1,1-Dichloropropene	**<2.7**	ug/L	9.0	2.7	5		03/10/20 09:18	563-58-6	
1,2,3-Trichlorobenzene	**<11.1**	ug/L	36.8	11.1	5		03/10/20 09:18	87-61-6	
1,2,3-Trichloropropane	**<3.0**	ug/L	25.0	3.0	5		03/10/20 09:18	96-18-4	
1,2,4-Trichlorobenzene	**<4.8**	ug/L	25.0	4.8	5		03/10/20 09:18	120-82-1	
1,2,4-Trimethylbenzene	**<4.2**	ug/L	14.0	4.2	5		03/10/20 09:18	95-63-6	
1,2-Dibromo-3-chloropropane	**<8.8**	ug/L	29.4	8.8	5		03/10/20 09:18	96-12-8	
1,2-Dibromoethane (EDB)	**<4.1**	ug/L	13.8	4.1	5		03/10/20 09:18	106-93-4	
1,2-Dichlorobenzene	**<3.5**	ug/L	11.8	3.5	5		03/10/20 09:18	95-50-1	
1,2-Dichloroethane	**<1.4**	ug/L	5.0	1.4	5		03/10/20 09:18	107-06-2	
1,2-Dichloropropane	**<1.4**	ug/L	5.0	1.4	5		03/10/20 09:18	78-87-5	
1,3,5-Trimethylbenzene	**<4.4**	ug/L	14.6	4.4	5		03/10/20 09:18	108-67-8	
1,3-Dichlorobenzene	**<3.1**	ug/L	10.5	3.1	5		03/10/20 09:18	541-73-1	
1,3-Dichloropropane	**<4.1**	ug/L	13.8	4.1	5		03/10/20 09:18	142-28-9	
1,4-Dichlorobenzene	**<4.7**	ug/L	15.7	4.7	5		03/10/20 09:18	106-46-7	
2,2-Dichloropropane	**<11.3**	ug/L	37.8	11.3	5		03/10/20 09:18	594-20-7	
2-Chlorotoluene	**<4.6**	ug/L	25.0	4.6	5		03/10/20 09:18	95-49-8	
4-Chlorotoluene	**<3.8**	ug/L	12.6	3.8	5		03/10/20 09:18	106-43-4	
Benzene	**<1.2**	ug/L	5.0	1.2	5		03/10/20 09:18	71-43-2	
Bromobenzene	**<1.2**	ug/L	5.0	1.2	5		03/10/20 09:18	108-86-1	
Bromochloromethane	**<1.8**	ug/L	25.0	1.8	5		03/10/20 09:18	74-97-5	
Bromodichloromethane	**<1.8**	ug/L	6.1	1.8	5		03/10/20 09:18	75-27-4	
Bromoform	**<19.9**	ug/L	66.2	19.9	5		03/10/20 09:18	75-25-2	
Bromomethane	**<4.9**	ug/L	25.0	4.9	5		03/10/20 09:18	74-83-9	
Carbon tetrachloride	**<8.2**	ug/L	27.3	8.2	5		03/10/20 09:18	56-23-5	
Chlorobenzene	**<3.6**	ug/L	11.8	3.6	5		03/10/20 09:18	108-90-7	
Chloroethane	**<6.7**	ug/L	25.0	6.7	5		03/10/20 09:18	75-00-3	
Chloroform	**<6.4**	ug/L	25.0	6.4	5		03/10/20 09:18	67-66-3	
Chloromethane	**<10.9**	ug/L	36.5	10.9	5		03/10/20 09:18	74-87-3	
Dibromochloromethane	**<13.0**	ug/L	43.4	13.0	5		03/10/20 09:18	124-48-1	
Dibromomethane	**<4.7**	ug/L	15.6	4.7	5		03/10/20 09:18	74-95-3	
Dichlorodifluoromethane	**<2.5**	ug/L	25.0	2.5	5		03/10/20 09:18	75-71-8	
Diisopropyl ether	**<9.4**	ug/L	31.5	9.4	5		03/10/20 09:18	108-20-3	
Ethylbenzene	**<1.6**	ug/L	5.3	1.6	5		03/10/20 09:18	100-41-4	
Hexachloro-1,3-butadiene	**<7.3**	ug/L	24.4	7.3	5		03/10/20 09:18	87-68-3	
Isopropylbenzene (Cumene)	**<8.4**	ug/L	28.1	8.4	5		03/10/20 09:18	98-82-8	
Methyl-tert-butyl ether	**<6.2**	ug/L	20.8	6.2	5		03/10/20 09:18	1634-04-4	
Methylene Chloride	**<2.9**	ug/L	25.0	2.9	5		03/10/20 09:18	75-09-2	
Naphthalene	**<5.9**	ug/L	25.0	5.9	5		03/10/20 09:18	91-20-3	
Styrene	**<15.0**	ug/L	50.2	15.0	5		03/10/20 09:18	100-42-5	
Tetrachloroethene	**<1.6**	ug/L	5.4	1.6	5		03/10/20 09:18	127-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-12 **Lab ID: 40204401007** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<1.3**	ug/L	4.5	1.3	5		03/10/20 09:18	108-88-3	
Trichloroethene	**<1.3**	ug/L	5.0	1.3	5		03/10/20 09:18	79-01-6	
Trichlorofluoromethane	**<1.1**	ug/L	5.0	1.1	5		03/10/20 09:18	75-69-4	
Vinyl chloride	**<0.87**	ug/L	5.0	0.87	5		03/10/20 09:18	75-01-4	
cis-1,2-Dichloroethene	**<1.4**	ug/L	5.0	1.4	5		03/10/20 09:18	156-59-2	
cis-1,3-Dichloropropene	**<18.1**	ug/L	60.5	18.1	5		03/10/20 09:18	10061-01-5	
m&p-Xylene	**<2.3**	ug/L	10.0	2.3	5		03/10/20 09:18	179601-23-1	
n-Butylbenzene	**<3.5**	ug/L	11.8	3.5	5		03/10/20 09:18	104-51-8	
n-Propylbenzene	**<4.1**	ug/L	25.0	4.1	5		03/10/20 09:18	103-65-1	
o-Xylene	**<1.3**	ug/L	5.0	1.3	5		03/10/20 09:18	95-47-6	
p-Isopropyltoluene	**<4.0**	ug/L	13.3	4.0	5		03/10/20 09:18	99-87-6	
sec-Butylbenzene	**<4.2**	ug/L	25.0	4.2	5		03/10/20 09:18	135-98-8	
tert-Butylbenzene	**<1.5**	ug/L	5.1	1.5	5		03/10/20 09:18	98-06-6	
trans-1,2-Dichloroethene	**<5.5**	ug/L	18.2	5.5	5		03/10/20 09:18	156-60-5	
trans-1,3-Dichloropropene	**<21.9**	ug/L	72.8	21.9	5		03/10/20 09:18	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%	70-130		5		03/10/20 09:18	460-00-4	D3
Dibromofluoromethane (S)	96	%	70-130		5		03/10/20 09:18	1868-53-7	
Toluene-d8 (S)	97	%	70-130		5		03/10/20 09:18	2037-26-5	

Sample: MW-25 **Lab ID: 40204401008** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		03/10/20 16:59	630-20-6	
1,1,1-Trichloroethane	**1.3**	ug/L	1.0	0.24	1		03/10/20 16:59	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:59	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		03/10/20 16:59	79-00-5	
1,1-Dichloroethane	**68.9**	ug/L	1.0	0.27	1		03/10/20 16:59	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:59	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		03/10/20 16:59	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		03/10/20 16:59	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		03/10/20 16:59	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		03/10/20 16:59	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		03/10/20 16:59	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		03/10/20 16:59	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		03/10/20 16:59	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:59	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:59	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		03/10/20 16:59	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		03/10/20 16:59	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		03/10/20 16:59	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		03/10/20 16:59	142-28-9	

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ANALYTICAL RESULTS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Sample: MW-25 **Lab ID: 40204401008** Collected: 03/05/20 13:00 Received: 03/07/20 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		03/10/20 16:59	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		03/10/20 16:59	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		03/10/20 16:59	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		03/10/20 16:59	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		03/10/20 16:59	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		03/10/20 16:59	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		03/10/20 16:59	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		03/10/20 16:59	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		03/10/20 16:59	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		03/10/20 16:59	74-83-9	
Carbon tetrachloride	**<1.6**	ug/L	5.5	1.6	1		03/10/20 16:59	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:59	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		03/10/20 16:59	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		03/10/20 16:59	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		03/10/20 16:59	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		03/10/20 16:59	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		03/10/20 16:59	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		03/10/20 16:59	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		03/10/20 16:59	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		03/10/20 16:59	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		03/10/20 16:59	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		03/10/20 16:59	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		03/10/20 16:59	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		03/10/20 16:59	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		03/10/20 16:59	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		03/10/20 16:59	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		03/10/20 16:59	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		03/10/20 16:59	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 16:59	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		03/10/20 16:59	75-69-4	
Vinyl chloride	**0.44J**	ug/L	1.0	0.17	1		03/10/20 16:59	75-01-4	
cis-1,2-Dichloroethene	**1.8**	ug/L	1.0	0.27	1		03/10/20 16:59	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		03/10/20 16:59	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		03/10/20 16:59	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		03/10/20 16:59	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		03/10/20 16:59	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		03/10/20 16:59	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		03/10/20 16:59	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		03/10/20 16:59	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		03/10/20 16:59	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		03/10/20 16:59	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		03/10/20 16:59	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	97	%	70-130		1		03/10/20 16:59	460-00-4	
Dibromofluoromethane (S)	98	%	70-130		1		03/10/20 16:59	1868-53-7	
Toluene-d8 (S)	97	%	70-130		1		03/10/20 16:59	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

QC Batch: 349471 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 40204401001, 40204401002, 40204401003, 40204401004, 40204401005, 40204401006, 40204401007, 40204401008

METHOD BLANK: 2024930 Matrix: Water
Associated Lab Samples: 40204401001, 40204401002, 40204401003, 40204401004, 40204401005, 40204401006, 40204401007, 40204401008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.27	1.0	03/10/20 07:43	
1,1,1-Trichloroethane	ug/L	<0.24	1.0	03/10/20 07:43	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	1.0	03/10/20 07:43	
1,1,2-Trichloroethane	ug/L	<0.55	5.0	03/10/20 07:43	
1,1-Dichloroethane	ug/L	<0.27	1.0	03/10/20 07:43	
1,1-Dichloroethene	ug/L	<0.24	1.0	03/10/20 07:43	
1,1-Dichloropropene	ug/L	<0.54	1.8	03/10/20 07:43	
1,2,3-Trichlorobenzene	ug/L	<2.2	7.4	03/10/20 07:43	
1,2,3-Trichloropropane	ug/L	<0.59	5.0	03/10/20 07:43	
1,2,4-Trichlorobenzene	ug/L	<0.95	5.0	03/10/20 07:43	
1,2,4-Trimethylbenzene	ug/L	<0.84	2.8	03/10/20 07:43	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	5.9	03/10/20 07:43	
1,2-Dibromoethane (EDB)	ug/L	<0.83	2.8	03/10/20 07:43	
1,2-Dichlorobenzene	ug/L	<0.71	2.4	03/10/20 07:43	
1,2-Dichloroethane	ug/L	<0.28	1.0	03/10/20 07:43	
1,2-Dichloropropane	ug/L	<0.28	1.0	03/10/20 07:43	
1,3,5-Trimethylbenzene	ug/L	<0.87	2.9	03/10/20 07:43	
1,3-Dichlorobenzene	ug/L	<0.63	2.1	03/10/20 07:43	
1,3-Dichloropropane	ug/L	<0.83	2.8	03/10/20 07:43	
1,4-Dichlorobenzene	ug/L	<0.94	3.1	03/10/20 07:43	
2,2-Dichloropropane	ug/L	<2.3	7.6	03/10/20 07:43	
2-Chlorotoluene	ug/L	<0.93	5.0	03/10/20 07:43	
4-Chlorotoluene	ug/L	<0.76	2.5	03/10/20 07:43	
Benzene	ug/L	<0.25	1.0	03/10/20 07:43	
Bromobenzene	ug/L	<0.24	1.0	03/10/20 07:43	
Bromochloromethane	ug/L	<0.36	5.0	03/10/20 07:43	
Bromodichloromethane	ug/L	<0.36	1.2	03/10/20 07:43	
Bromoform	ug/L	<4.0	13.2	03/10/20 07:43	
Bromomethane	ug/L	<0.97	5.0	03/10/20 07:43	
Carbon tetrachloride	ug/L	<1.6	5.5	03/10/20 07:43	
Chlorobenzene	ug/L	<0.71	2.4	03/10/20 07:43	
Chloroethane	ug/L	<1.3	5.0	03/10/20 07:43	
Chloroform	ug/L	<1.3	5.0	03/10/20 07:43	
Chloromethane	ug/L	<2.2	7.3	03/10/20 07:43	
cis-1,2-Dichloroethene	ug/L	<0.27	1.0	03/10/20 07:43	
cis-1,3-Dichloropropene	ug/L	<3.6	12.1	03/10/20 07:43	
Dibromochloromethane	ug/L	<2.6	8.7	03/10/20 07:43	
Dibromomethane	ug/L	<0.94	3.1	03/10/20 07:43	
Dichlorodifluoromethane	ug/L	<0.50	5.0	03/10/20 07:43	
Diisopropyl ether	ug/L	<1.9	6.3	03/10/20 07:43	

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REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

METHOD BLANK: 2024930 Matrix: Water

Associated Lab Samples: 40204401001, 40204401002, 40204401003, 40204401004, 40204401005, 40204401006, 40204401007, 40204401008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylbenzene	ug/L	<0.32	1.1	03/10/20 07:43	
Hexachloro-1,3-butadiene	ug/L	<1.5	4.9	03/10/20 07:43	
Isopropylbenzene (Cumene)	ug/L	<1.7	5.6	03/10/20 07:43	
m&p-Xylene	ug/L	<0.47	2.0	03/10/20 07:43	
Methyl-tert-butyl ether	ug/L	<1.2	4.2	03/10/20 07:43	
Methylene Chloride	ug/L	<0.58	5.0	03/10/20 07:43	
n-Butylbenzene	ug/L	<0.71	2.4	03/10/20 07:43	
n-Propylbenzene	ug/L	<0.81	5.0	03/10/20 07:43	
Naphthalene	ug/L	<1.2	5.0	03/10/20 07:43	
o-Xylene	ug/L	<0.26	1.0	03/10/20 07:43	
p-Isopropyltoluene	ug/L	<0.80	2.7	03/10/20 07:43	
sec-Butylbenzene	ug/L	<0.85	5.0	03/10/20 07:43	
Styrene	ug/L	<3.0	10.0	03/10/20 07:43	
tert-Butylbenzene	ug/L	<0.30	1.0	03/10/20 07:43	
Tetrachloroethene	ug/L	<0.33	1.1	03/10/20 07:43	
Toluene	ug/L	<0.27	0.90	03/10/20 07:43	
trans-1,2-Dichloroethene	ug/L	<1.1	3.6	03/10/20 07:43	
trans-1,3-Dichloropropene	ug/L	<4.4	14.6	03/10/20 07:43	
Trichloroethene	ug/L	<0.26	1.0	03/10/20 07:43	
Trichlorofluoromethane	ug/L	<0.21	1.0	03/10/20 07:43	
Vinyl chloride	ug/L	<0.17	1.0	03/10/20 07:43	
4-Bromofluorobenzene (S)	%	100	70-130	03/10/20 07:43	
Dibromofluoromethane (S)	%	95	70-130	03/10/20 07:43	
Toluene-d8 (S)	%	95	70-130	03/10/20 07:43	

LABORATORY CONTROL SAMPLE: 2024931

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	56.3	113	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	45.6	91	70-130	
1,1,2-Trichloroethane	ug/L	50	48.3	97	70-130	
1,1-Dichloroethane	ug/L	50	52.5	105	73-150	
1,1-Dichloroethene	ug/L	50	51.0	102	73-138	
1,2,4-Trichlorobenzene	ug/L	50	42.0	84	70-130	
1,2-Dibromo-3-chloropropane	ug/L	50	40.4	81	64-129	
1,2-Dibromoethane (EDB)	ug/L	50	47.8	96	70-130	
1,2-Dichlorobenzene	ug/L	50	47.1	94	70-130	
1,2-Dichloroethane	ug/L	50	48.9	98	75-140	
1,2-Dichloropropane	ug/L	50	52.1	104	73-135	
1,3-Dichlorobenzene	ug/L	50	47.3	95	70-130	
1,4-Dichlorobenzene	ug/L	50	47.0	94	70-130	
Benzene	ug/L	50	52.4	105	70-130	
Bromodichloromethane	ug/L	50	51.7	103	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

LABORATORY CONTROL SAMPLE: 2024931

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromoform	ug/L	50	44.5	89	68-129	
Bromomethane	ug/L	50	39.7	79	18-159	
Carbon tetrachloride	ug/L	50	57.1	114	70-130	
Chlorobenzene	ug/L	50	52.3	105	70-130	
Chloroethane	ug/L	50	51.6	103	53-147	
Chloroform	ug/L	50	51.2	102	74-136	
Chloromethane	ug/L	50	46.1	92	29-115	
cis-1,2-Dichloroethene	ug/L	50	52.6	105	70-130	
cis-1,3-Dichloropropene	ug/L	50	50.0	100	70-130	
Dibromochloromethane	ug/L	50	50.7	101	70-130	
Dichlorodifluoromethane	ug/L	50	41.1	82	10-130	
Ethylbenzene	ug/L	50	54.5	109	80-124	
Isopropylbenzene (Cumene)	ug/L	50	56.0	112	70-130	
m&p-Xylene	ug/L	100	108	108	70-130	
Methyl-tert-butyl ether	ug/L	50	47.1	94	54-137	
Methylene Chloride	ug/L	50	52.5	105	73-138	
o-Xylene	ug/L	50	54.7	109	70-130	
Styrene	ug/L	50	56.3	113	70-130	
Tetrachloroethene	ug/L	50	52.2	104	70-130	
Toluene	ug/L	50	50.4	101	80-126	
trans-1,2-Dichloroethene	ug/L	50	51.6	103	73-145	
trans-1,3-Dichloropropene	ug/L	50	47.9	96	70-130	
Trichloroethene	ug/L	50	55.2	110	70-130	
Trichlorofluoromethane	ug/L	50	63.8	128	76-147	
Vinyl chloride	ug/L	50	47.6	95	51-120	
4-Bromofluorobenzene (S)	%			105	70-130	
Dibromofluoromethane (S)	%			101	70-130	
Toluene-d8 (S)	%			97	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2025211 2025212

Parameter	Units	40204399001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	<0.24	50	50	56.0	54.5	112	109	70-130	3	20	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	50	50	49.5	46.6	99	93	70-130	6	20	
1,1,2-Trichloroethane	ug/L	<0.55	50	50	47.6	49.3	95	99	70-137	4	20	
1,1-Dichloroethane	ug/L	<0.27	50	50	53.0	52.5	106	105	73-153	1	20	
1,1-Dichloroethene	ug/L	<0.24	50	50	51.1	52.1	102	104	73-138	2	20	
1,2,4-Trichlorobenzene	ug/L	<0.95	50	50	41.1	41.0	82	82	70-130	0	20	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	50	50	45.0	43.1	90	86	58-129	4	20	
1,2-Dibromoethane (EDB)	ug/L	<0.83	50	50	48.8	48.4	98	97	70-130	1	20	
1,2-Dichlorobenzene	ug/L	<0.71	50	50	47.1	46.7	94	93	70-130	1	20	
1,2-Dichloroethane	ug/L	<0.28	50	50	50.5	48.8	101	98	75-140	4	20	
1,2-Dichloropropane	ug/L	<0.28	50	50	54.4	50.6	109	101	71-138	7	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2025211 2025212

Parameter	Units	40204399001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,3-Dichlorobenzene	ug/L	<0.63	50	50	49.1	47.6	98	95	70-130	3	20	
1,4-Dichlorobenzene	ug/L	<0.94	50	50	46.8	46.6	94	93	70-130	0	20	
Benzene	ug/L	<0.25	50	50	52.9	52.3	106	105	70-130	1	20	
Bromodichloromethane	ug/L	<0.36	50	50	52.9	50.1	106	100	70-130	5	20	
Bromoform	ug/L	<4.0	50	50	45.4	44.3	91	89	68-129	2	20	
Bromomethane	ug/L	<0.97	50	50	45.5	45.0	91	90	15-170	1	20	
Carbon tetrachloride	ug/L	<1.6	50	50	58.2	56.7	116	113	70-130	3	20	
Chlorobenzene	ug/L	<0.71	50	50	51.7	52.1	103	104	70-130	1	20	
Chloroethane	ug/L	<1.3	50	50	52.1	52.6	104	105	51-148	1	20	
Chloroform	ug/L	<1.3	50	50	51.6	51.4	103	103	74-136	0	20	
Chloromethane	ug/L	<2.2	50	50	47.5	46.3	95	93	23-115	2	20	
cis-1,2-Dichloroethene	ug/L	<0.27	50	50	52.7	51.9	105	104	70-131	2	20	
cis-1,3-Dichloropropene	ug/L	<3.6	50	50	52.6	50.0	105	100	70-130	5	20	
Dibromochloromethane	ug/L	<2.6	50	50	49.9	51.0	100	102	70-130	2	20	
Dichlorodifluoromethane	ug/L	<0.50	50	50	40.3	41.1	81	82	10-132	2	20	
Ethylbenzene	ug/L	<0.32	50	50	53.5	53.7	107	107	80-125	0	20	
Isopropylbenzene (Cumene)	ug/L	<1.7	50	50	54.3	54.6	109	109	70-130	1	20	
m&p-Xylene	ug/L	<0.47	100	100	107	108	107	108	70-130	1	20	
Methyl-tert-butyl ether	ug/L	<1.2	50	50	49.9	49.3	100	99	51-145	1	20	
Methylene Chloride	ug/L	<0.58	50	50	52.7	49.8	105	100	73-140	6	20	
o-Xylene	ug/L	<0.26	50	50	53.2	53.5	106	107	70-130	1	20	
Styrene	ug/L	<3.0	50	50	54.3	55.6	109	111	70-130	2	20	
Tetrachloroethene	ug/L	<0.33	50	50	52.9	53.2	106	106	70-130	0	20	
Toluene	ug/L	<0.27	50	50	50.4	50.8	101	102	80-131	1	20	
trans-1,2-Dichloroethene	ug/L	<1.1	50	50	52.3	52.3	105	105	73-148	0	20	
trans-1,3-Dichloropropene	ug/L	<4.4	50	50	48.0	47.7	96	95	70-130	1	20	
Trichloroethene	ug/L	0.42J	50	50	57.1	55.5	113	110	70-130	3	20	
Trichlorofluoromethane	ug/L	<0.21	50	50	63.5	62.0	127	124	74-147	2	20	
Vinyl chloride	ug/L	<0.17	50	50	49.1	48.1	98	96	41-129	2	20	
4-Bromofluorobenzene (S)	%						101	106	70-130			
Dibromofluoromethane (S)	%						98	100	70-130			
Toluene-d8 (S)	%						95	97	70-130			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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(920)469-2436

QUALIFIERS

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TD P3 1ST QTR-BROACH WELLS
Pace Project No.: 40204401

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40204401001	**MW-1**	EPA 8260	349471		
40204401002	**MW-2**	EPA 8260	349471		
40204401003	**MW-6**	EPA 8260	349471		
40204401004	**MW-7**	EPA 8260	349471		
40204401005	**MW-9**	EPA 8260	349471		
40204401006	**MW-10**	EPA 8260	349471		
40204401007	**MW-12**	EPA 8260	349471		
40204401008	**MW-25**	EPA 8260	349471		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

40204401

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Environmental Audits Inc.	Report To:	jrruetz@yahoo.com;	Attention:	John Ruetz
Address:	11327 W Lincoln Avenue	Copy To:	eerill@wi.rr.com; john@environmentalaudits.net	Company Name:	Environmental Audits Inc.
	West Allis Wi 53051		steph@environmentalaudits.net	Address:	11327 W Lincoln Avenue
Email To:	john@environmentalaudits.net	Purchase Order No:	Verbal	Pace Quote Reference:	
Phone:	414-226-5563 Fax	Project Name:	TD P3 1st Qtr GW – Broach Wells	Pace Project Manager:	
Requested Due Date/TAT:		Project Number:		Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER

Site Location STATE: WI

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / ,) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Analysis Test: VOC	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-1	GW	G			3/5/20	1pm		3				x					Y	3		001
2	MW-2	GW	G			3/5/20	1pm		3				x					Y	3		002
3	MW-6	GW	G			3/5/20	1pm		3				x					Y	3		003
4	MW-7	GW	G			3/5/20	1pm		3				x					Y	3		004
5	MW-9	GW	G			3/5/20	1pm		3				x					Y	3		005
6	MW-10	GW	G			3/5/20	1pm		3				x					Y	3		006
7	MW-12	GW	G			3/5/20	1pm		3				x					Y	3		007
8	MW-25	GW	G			3/5/20	1pm		3				x					Y	3		008
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Steve Tiber	3/6/20	11:24	Mary Fannin	3/6/20	11:24	
	Mary Fannin	3/6/20	11:50				
	CS Logistics	3/7/20	0845	Brittin Carter Pace	3/7/20	0845	Cool Y N Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Steve Tiber

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 3/6/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Sample Preservation Receipt Form

Client Name: Environmental Analysts Inc. Project # 40204401

All containers needing preservation have been checked and noted below: ☐Yes ☐No ☒N/A

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

Initial when completed: Date/ Time:

Pace Lab #	Glass								Plastic					Vials						Jars				General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN							
001																	3																2.5 / 5 / 10
002																	3																2.5 / 5 / 10
003																	3																2.5 / 5 / 10
004																	3																2.5 / 5 / 10
005																	3																2.5 / 5 / 10
006																	3																2.5 / 5 / 10
007																	3																2.5 / 5 / 10
008																	3																2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																	3-1-2 ORP																2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																												2 BL					2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm): ☐Yes ☒No ☐N/A *If yes look in headspace column

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG4U	120 mL amber glass unpres
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4

VG9A	40 mL clear ascorbic
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN	

Pace Analytical™ 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: WO#: 40204401

Client Name: Environmental Audits Inc.

Courier: ☒ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

Tracking #:

Custody Seal on Cooler/Box Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other

Thermometer Used SR - 9 **Type of Ice:** ☒ Wet Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 1.4 /Corr: 1.4

Temp Blank Present: ☐ yes ☒ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Person examining contents: Date: 3-7-20 Initials: BR

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No	6.
Rush Turn Around Time Requested:	☐Yes ☒No	7.
Sufficient Volume: For Analysis: ☒Yes ☐No MS/MSD:	☐Yes ☒No ☐N/A	8.
Correct Containers Used:	☒Yes ☐No	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11. 3-7-20 BR
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: W	☐Yes ☒No ☐N/A	12. No times Samples 001-008, all samples 3@ LCT.
Trip Blank Present:	☐Yes ☐No ☒N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: AFS - DM **Date:** 3/7/2020

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

June 17, 2020

John Ruetz
Environmental Audits Inc
11327 W Lincoln Ave
West Allis, WI 53227

RE: Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Dear John Ruetz:

Enclosed are the analytical results for sample(s) received by the laboratory on June 15, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Green Bay

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Ed Raymond, Environmental Audits, Inc
Steve Tiber, Environmental Audits Inc.
Stephanie Wagner, Environmental Audits, Inc.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40209482001	MW-11	Water	06/11/20 13:00	06/15/20 09:15
40209482002	MW-13	Water	06/11/20 13:00	06/15/20 09:15
40209482003	MW-14	Water	06/11/20 13:00	06/15/20 09:15
40209482004	MW-15	Water	06/11/20 13:00	06/15/20 09:15
40209482005	MW-17	Water	06/11/20 13:00	06/15/20 09:15
40209482006	MW-19	Water	06/11/20 13:00	06/15/20 09:15
40209482007	MW-22	Water	06/11/20 13:00	06/15/20 09:15
40209482008	MW-23	Water	06/11/20 13:00	06/15/20 09:15
40209482009	MW-24	Water	06/11/20 13:00	06/15/20 09:15
40209482010	MW-26	Water	06/11/20 13:00	06/15/20 09:15
40209482011	MW-402	Water	06/11/20 13:00	06/15/20 09:15

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SAMPLE ANALYTE COUNT

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40209482001	MW-11	EPA 8260	HNW	64
40209482002	MW-13	EPA 8260	HNW	64
40209482003	MW-14	EPA 8260	HNW	64
40209482004	MW-15	EPA 8260	HNW	64
40209482005	MW-17	EPA 8260	HNW	64
40209482006	MW-19	EPA 8260	HNW	64
40209482007	MW-22	EPA 8260	HNW	64
40209482008	MW-23	EPA 8260	HNW	64
40209482009	MW-24	EPA 8260	HNW	64
40209482010	MW-26	EPA 8260	HNW	64
40209482011	MW-402	EPA 8260	HNW	64

PASI-G = Pace Analytical Services - Green Bay

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1241 Bellevue Street - Suite 9
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(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-11 **Lab ID: 40209482001** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.54**	ug/L	2.0	0.54	2		06/16/20 09:10	630-20-6	
1,1,1-Trichloroethane	**<0.49**	ug/L	2.0	0.49	2		06/16/20 09:10	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.55**	ug/L	2.0	0.55	2		06/16/20 09:10	79-34-5	
1,1,2-Trichloroethane	**<1.1**	ug/L	10.0	1.1	2		06/16/20 09:10	79-00-5	
1,1-Dichloroethane	**<0.55**	ug/L	2.0	0.55	2		06/16/20 09:10	75-34-3	
1,1-Dichloroethene	**<0.49**	ug/L	2.0	0.49	2		06/16/20 09:10	75-35-4	
1,1-Dichloropropene	**<1.1**	ug/L	3.6	1.1	2		06/16/20 09:10	563-58-6	
1,2,3-Trichlorobenzene	**<4.4**	ug/L	14.7	4.4	2		06/16/20 09:10	87-61-6	
1,2,3-Trichloropropane	**<1.2**	ug/L	10.0	1.2	2		06/16/20 09:10	96-18-4	
1,2,4-Trichlorobenzene	**<1.9**	ug/L	10.0	1.9	2		06/16/20 09:10	120-82-1	
1,2,4-Trimethylbenzene	**<1.7**	ug/L	5.6	1.7	2		06/16/20 09:10	95-63-6	
1,2-Dibromo-3-chloropropane	**<3.5**	ug/L	11.8	3.5	2		06/16/20 09:10	96-12-8	
1,2-Dibromoethane (EDB)	**<1.7**	ug/L	5.5	1.7	2		06/16/20 09:10	106-93-4	
1,2-Dichlorobenzene	**<1.4**	ug/L	4.7	1.4	2		06/16/20 09:10	95-50-1	
1,2-Dichloroethane	**<0.56**	ug/L	2.0	0.56	2		06/16/20 09:10	107-06-2	
1,2-Dichloropropane	**<0.57**	ug/L	2.0	0.57	2		06/16/20 09:10	78-87-5	
1,3,5-Trimethylbenzene	**<1.7**	ug/L	5.8	1.7	2		06/16/20 09:10	108-67-8	
1,3-Dichlorobenzene	**<1.3**	ug/L	4.2	1.3	2		06/16/20 09:10	541-73-1	
1,3-Dichloropropane	**<1.7**	ug/L	5.5	1.7	2		06/16/20 09:10	142-28-9	
1,4-Dichlorobenzene	**<1.9**	ug/L	6.3	1.9	2		06/16/20 09:10	106-46-7	
2,2-Dichloropropane	**<4.5**	ug/L	15.1	4.5	2		06/16/20 09:10	594-20-7	
2-Chlorotoluene	**<1.9**	ug/L	10.0	1.9	2		06/16/20 09:10	95-49-8	
4-Chlorotoluene	**<1.5**	ug/L	5.0	1.5	2		06/16/20 09:10	106-43-4	
Benzene	**<0.49**	ug/L	2.0	0.49	2		06/16/20 09:10	71-43-2	
Bromobenzene	**<0.48**	ug/L	2.0	0.48	2		06/16/20 09:10	108-86-1	
Bromochloromethane	**<0.72**	ug/L	10.0	0.72	2		06/16/20 09:10	74-97-5	
Bromodichloromethane	**<0.73**	ug/L	2.4	0.73	2		06/16/20 09:10	75-27-4	
Bromoform	**<7.9**	ug/L	26.5	7.9	2		06/16/20 09:10	75-25-2	
Bromomethane	**<1.9**	ug/L	10.0	1.9	2		06/16/20 09:10	74-83-9	
Carbon tetrachloride	**<2.2**	ug/L	7.2	2.2	2		06/16/20 09:10	56-23-5	
Chlorobenzene	**<1.4**	ug/L	4.7	1.4	2		06/16/20 09:10	108-90-7	
Chloroethane	**<2.7**	ug/L	10.0	2.7	2		06/16/20 09:10	75-00-3	
Chloroform	**<2.5**	ug/L	10.0	2.5	2		06/16/20 09:10	67-66-3	
Chloromethane	**<4.4**	ug/L	14.6	4.4	2		06/16/20 09:10	74-87-3	
Dibromochloromethane	**<5.2**	ug/L	17.3	5.2	2		06/16/20 09:10	124-48-1	
Dibromomethane	**<1.9**	ug/L	6.2	1.9	2		06/16/20 09:10	74-95-3	
Dichlorodifluoromethane	**<1.0**	ug/L	10.0	1.0	2		06/16/20 09:10	75-71-8	
Diisopropyl ether	**<3.8**	ug/L	12.6	3.8	2		06/16/20 09:10	108-20-3	
Ethylbenzene	**<0.64**	ug/L	2.1	0.64	2		06/16/20 09:10	100-41-4	
Hexachloro-1,3-butadiene	**<2.9**	ug/L	9.8	2.9	2		06/16/20 09:10	87-68-3	
Isopropylbenzene (Cumene)	**<3.4**	ug/L	11.2	3.4	2		06/16/20 09:10	98-82-8	
Methyl-tert-butyl ether	**<2.5**	ug/L	8.3	2.5	2		06/16/20 09:10	1634-04-4	
Methylene Chloride	**<1.2**	ug/L	10.0	1.2	2		06/16/20 09:10	75-09-2	
Naphthalene	**<2.4**	ug/L	10.0	2.4	2		06/16/20 09:10	91-20-3	
Styrene	**<6.0**	ug/L	20.1	6.0	2		06/16/20 09:10	100-42-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-11 **Lab ID: 40209482001** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Tetrachloroethene	**2.7**	ug/L	2.2	0.65	2		06/16/20 09:10	127-18-4	
Toluene	**<0.54**	ug/L	1.8	0.54	2		06/16/20 09:10	108-88-3	
Trichloroethene	**4.9**	ug/L	2.0	0.51	2		06/16/20 09:10	79-01-6	
Trichlorofluoromethane	**<0.43**	ug/L	2.0	0.43	2		06/16/20 09:10	75-69-4	
Vinyl chloride	**<0.35**	ug/L	2.0	0.35	2		06/16/20 09:10	75-01-4	
cis-1,2-Dichloroethene	**133**	ug/L	2.0	0.54	2		06/16/20 09:10	156-59-2	
cis-1,3-Dichloropropene	**<7.3**	ug/L	24.2	7.3	2		06/16/20 09:10	10061-01-5	
m&p-Xylene	**<0.93**	ug/L	4.0	0.93	2		06/16/20 09:10	179601-23-1	
n-Butylbenzene	**<1.4**	ug/L	4.7	1.4	2		06/16/20 09:10	104-51-8	
n-Propylbenzene	**<1.6**	ug/L	10.0	1.6	2		06/16/20 09:10	103-65-1	
o-Xylene	**<0.52**	ug/L	2.0	0.52	2		06/16/20 09:10	95-47-6	
p-Isopropyltoluene	**<1.6**	ug/L	5.3	1.6	2		06/16/20 09:10	99-87-6	
sec-Butylbenzene	**<1.7**	ug/L	10.0	1.7	2		06/16/20 09:10	135-98-8	
tert-Butylbenzene	**<0.61**	ug/L	2.0	0.61	2		06/16/20 09:10	98-06-6	
trans-1,2-Dichloroethene	**7.2**	ug/L	3.1	0.93	2		06/16/20 09:10	156-60-5	
trans-1,3-Dichloropropene	**<8.7**	ug/L	29.1	8.7	2		06/16/20 09:10	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	92	%	70-130		2		06/16/20 09:10	460-00-4	
Dibromofluoromethane (S)	99	%	70-130		2		06/16/20 09:10	1868-53-7	
Toluene-d8 (S)	98	%	70-130		2		06/16/20 09:10	2037-26-5	

Sample: MW-13 **Lab ID: 40209482002** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 12:09	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 12:09	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:09	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 12:09	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 12:09	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 12:09	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 12:09	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 12:09	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 12:09	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 12:09	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 12:09	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 12:09	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 12:09	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:09	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:09	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:09	78-87-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-13 **Lab ID: 40209482002** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 12:09	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 12:09	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 12:09	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 12:09	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 12:09	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 12:09	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 12:09	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 12:09	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 12:09	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 12:09	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 12:09	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 12:09	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 12:09	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 12:09	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:09	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 12:09	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 12:09	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 12:09	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 12:09	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 12:09	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 12:09	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 12:09	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 12:09	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 12:09	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 12:09	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 12:09	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 12:09	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 12:09	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 12:09	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 12:09	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 12:09	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 12:09	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 12:09	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 12:09	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 12:09	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 12:09	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 12:09	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:09	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 12:09	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 12:09	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 12:09	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 12:09	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 12:09	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 12:09	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 12:09	10061-02-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-13 **Lab ID: 40209482002** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Surrogates									
4-Bromofluorobenzene (S)	91	%	70-130		1		06/16/20 12:09	460-00-4	
Dibromofluoromethane (S)	96	%	70-130		1		06/16/20 12:09	1868-53-7	
Toluene-d8 (S)	98	%	70-130		1		06/16/20 12:09	2037-26-5	

Sample: MW-14 **Lab ID: 40209482003** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 12:32	630-20-6	
1,1,1-Trichloroethane	**41.1**	ug/L	1.0	0.24	1		06/16/20 12:32	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:32	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 12:32	79-00-5	
1,1-Dichloroethane	**29.6**	ug/L	1.0	0.27	1		06/16/20 12:32	75-34-3	
1,1-Dichloroethene	**3.2**	ug/L	1.0	0.24	1		06/16/20 12:32	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 12:32	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 12:32	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 12:32	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 12:32	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 12:32	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 12:32	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 12:32	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:32	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:32	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:32	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 12:32	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 12:32	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 12:32	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 12:32	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 12:32	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 12:32	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 12:32	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 12:32	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 12:32	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 12:32	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 12:32	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 12:32	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 12:32	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 12:32	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:32	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 12:32	75-00-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-14 **Lab ID: 40209482003** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 12:32	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 12:32	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 12:32	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 12:32	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 12:32	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 12:32	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 12:32	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 12:32	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 12:32	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 12:32	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 12:32	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 12:32	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 12:32	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 12:32	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 12:32	108-88-3	
Trichloroethene	**9.2**	ug/L	1.0	0.26	1		06/16/20 12:32	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 12:32	75-69-4	
Vinyl chloride	**0.80J**	ug/L	1.0	0.17	1		06/16/20 12:32	75-01-4	
cis-1,2-Dichloroethene	**8.6**	ug/L	1.0	0.27	1		06/16/20 12:32	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 12:32	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 12:32	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:32	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 12:32	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 12:32	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 12:32	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 12:32	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 12:32	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 12:32	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 12:32	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		06/16/20 12:32	460-00-4	
Dibromofluoromethane (S)	98	%	70-130		1		06/16/20 12:32	1868-53-7	
Toluene-d8 (S)	99	%	70-130		1		06/16/20 12:32	2037-26-5	

Sample: MW-15 **Lab ID: 40209482004** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 12:54	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 12:54	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:54	79-34-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-15 **Lab ID: 40209482004** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 12:54	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 12:54	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 12:54	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 12:54	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 12:54	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 12:54	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 12:54	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 12:54	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 12:54	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 12:54	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:54	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:54	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 12:54	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 12:54	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 12:54	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 12:54	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 12:54	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 12:54	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 12:54	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 12:54	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 12:54	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 12:54	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 12:54	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 12:54	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 12:54	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 12:54	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 12:54	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:54	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 12:54	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 12:54	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 12:54	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 12:54	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 12:54	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 12:54	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 12:54	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 12:54	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 12:54	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 12:54	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 12:54	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 12:54	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 12:54	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 12:54	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 12:54	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 12:54	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 12:54	79-01-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-15 **Lab ID: 40209482004** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 12:54	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 12:54	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 12:54	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 12:54	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 12:54	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 12:54	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 12:54	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 12:54	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 12:54	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 12:54	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 12:54	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 12:54	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 12:54	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	91	%	70-130		1		06/16/20 12:54	460-00-4	
Dibromofluoromethane (S)	98	%	70-130		1		06/16/20 12:54	1868-53-7	
Toluene-d8 (S)	98	%	70-130		1		06/16/20 12:54	2037-26-5	

Sample: MW-17 **Lab ID: 40209482005** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 13:16	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 13:16	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 13:16	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 13:16	79-00-5	
1,1-Dichloroethane	**0.29J**	ug/L	1.0	0.27	1		06/16/20 13:16	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 13:16	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 13:16	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 13:16	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 13:16	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 13:16	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 13:16	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 13:16	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 13:16	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 13:16	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 13:16	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 13:16	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 13:16	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 13:16	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 13:16	142-28-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-17 **Lab ID: 40209482005** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 13:16	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 13:16	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 13:16	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 13:16	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 13:16	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 13:16	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 13:16	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 13:16	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 13:16	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 13:16	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 13:16	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 13:16	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 13:16	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 13:16	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 13:16	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 13:16	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 13:16	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 13:16	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 13:16	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 13:16	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 13:16	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 13:16	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 13:16	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 13:16	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 13:16	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 13:16	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 13:16	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 13:16	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 13:16	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 13:16	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 13:16	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 13:16	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 13:16	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 13:16	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 13:16	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 13:16	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 13:16	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 13:16	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 13:16	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 13:16	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 13:16	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 13:16	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	91	%	70-130		1		06/16/20 13:16	460-00-4	
Dibromofluoromethane (S)	97	%	70-130		1		06/16/20 13:16	1868-53-7	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-17 **Lab ID: 40209482005** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Surrogates									
Toluene-d8 (S)	99	%	70-130		1		06/16/20 13:16	2037-26-5	

Sample: MW-19 **Lab ID: 40209482006** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 13:39	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 13:39	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 13:39	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 13:39	79-00-5	
1,1-Dichloroethane	**0.42J**	ug/L	1.0	0.27	1		06/16/20 13:39	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 13:39	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 13:39	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 13:39	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 13:39	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 13:39	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 13:39	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 13:39	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 13:39	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 13:39	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 13:39	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 13:39	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 13:39	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 13:39	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 13:39	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 13:39	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 13:39	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 13:39	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 13:39	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 13:39	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 13:39	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 13:39	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 13:39	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 13:39	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 13:39	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 13:39	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 13:39	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 13:39	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 13:39	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 13:39	74-87-3	

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ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-19 **Lab ID: 40209482006** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 13:39	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 13:39	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 13:39	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 13:39	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 13:39	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 13:39	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 13:39	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 13:39	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 13:39	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 13:39	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 13:39	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 13:39	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 13:39	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 13:39	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 13:39	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 13:39	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 13:39	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 13:39	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 13:39	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 13:39	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 13:39	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 13:39	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 13:39	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 13:39	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 13:39	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 13:39	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 13:39	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	91	%	70-130		1		06/16/20 13:39	460-00-4	
Dibromofluoromethane (S)	98	%	70-130		1		06/16/20 13:39	1868-53-7	
Toluene-d8 (S)	98	%	70-130		1		06/16/20 13:39	2037-26-5	

Sample: MW-22 **Lab ID: 40209482007** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 16:52	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 16:52	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 16:52	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 16:52	79-00-5	
1,1-Dichloroethane	**0.39J**	ug/L	1.0	0.27	1		06/16/20 16:52	75-34-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-22 **Lab ID: 40209482007** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 16:52	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 16:52	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 16:52	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 16:52	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 16:52	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 16:52	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 16:52	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 16:52	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 16:52	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 16:52	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 16:52	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 16:52	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 16:52	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 16:52	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 16:52	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 16:52	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 16:52	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 16:52	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 16:52	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 16:52	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 16:52	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 16:52	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 16:52	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 16:52	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 16:52	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 16:52	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 16:52	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 16:52	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 16:52	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 16:52	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 16:52	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 16:52	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 16:52	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 16:52	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 16:52	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 16:52	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 16:52	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 16:52	75-09-2	
Naphthalene	**1.7J**	ug/L	5.0	1.2	1		06/16/20 16:52	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 16:52	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 16:52	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 16:52	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 16:52	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 16:52	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 16:52	75-01-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-22 **Lab ID: 40209482007** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 16:52	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 16:52	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 16:52	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 16:52	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 16:52	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 16:52	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 16:52	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 16:52	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 16:52	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 16:52	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 16:52	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		06/16/20 16:52	460-00-4	
Dibromofluoromethane (S)	90	%	70-130		1		06/16/20 16:52	1868-53-7	
Toluene-d8 (S)	99	%	70-130		1		06/16/20 16:52	2037-26-5	

Sample: MW-23 **Lab ID: 40209482008** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 17:14	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:14	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:14	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 17:14	79-00-5	
1,1-Dichloroethane	**0.68J**	ug/L	1.0	0.27	1		06/16/20 17:14	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:14	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 17:14	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 17:14	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 17:14	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 17:14	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 17:14	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 17:14	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 17:14	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:14	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:14	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:14	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 17:14	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 17:14	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 17:14	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 17:14	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 17:14	594-20-7	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-23 **Lab ID: 40209482008** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 17:14	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 17:14	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 17:14	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:14	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 17:14	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 17:14	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 17:14	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 17:14	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 17:14	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:14	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 17:14	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 17:14	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 17:14	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 17:14	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 17:14	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 17:14	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 17:14	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 17:14	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 17:14	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 17:14	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 17:14	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 17:14	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 17:14	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 17:14	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 17:14	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 17:14	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 17:14	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 17:14	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 17:14	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 17:14	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 17:14	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 17:14	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:14	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 17:14	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 17:14	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 17:14	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 17:14	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 17:14	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 17:14	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 17:14	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	70-130		1		06/16/20 17:14	460-00-4	
Dibromofluoromethane (S)	93	%	70-130		1		06/16/20 17:14	1868-53-7	
Toluene-d8 (S)	99	%	70-130		1		06/16/20 17:14	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-24 **Lab ID: 40209482009** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
	Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<1.1**	ug/L	4.0	1.1	4		06/16/20 09:32	630-20-6	
1,1,1-Trichloroethane	**32.9**	ug/L	4.0	0.98	4		06/16/20 09:32	71-55-6	
1,1,2,2-Tetrachloroethane	**<1.1**	ug/L	4.0	1.1	4		06/16/20 09:32	79-34-5	
1,1,2-Trichloroethane	**<2.2**	ug/L	20.0	2.2	4		06/16/20 09:32	79-00-5	
1,1-Dichloroethane	**251**	ug/L	4.0	1.1	4		06/16/20 09:32	75-34-3	
1,1-Dichloroethene	**1.7J**	ug/L	4.0	0.98	4		06/16/20 09:32	75-35-4	
1,1-Dichloropropene	**<2.2**	ug/L	7.2	2.2	4		06/16/20 09:32	563-58-6	
1,2,3-Trichlorobenzene	**<8.8**	ug/L	29.5	8.8	4		06/16/20 09:32	87-61-6	
1,2,3-Trichloropropane	**<2.4**	ug/L	20.0	2.4	4		06/16/20 09:32	96-18-4	
1,2,4-Trichlorobenzene	**<3.8**	ug/L	20.0	3.8	4		06/16/20 09:32	120-82-1	
1,2,4-Trimethylbenzene	**<3.4**	ug/L	11.2	3.4	4		06/16/20 09:32	95-63-6	
1,2-Dibromo-3-chloropropane	**<7.1**	ug/L	23.5	7.1	4		06/16/20 09:32	96-12-8	
1,2-Dibromoethane (EDB)	**<3.3**	ug/L	11.1	3.3	4		06/16/20 09:32	106-93-4	
1,2-Dichlorobenzene	**<2.8**	ug/L	9.4	2.8	4		06/16/20 09:32	95-50-1	
1,2-Dichloroethane	**1.3J**	ug/L	4.0	1.1	4		06/16/20 09:32	107-06-2	
1,2-Dichloropropane	**<1.1**	ug/L	4.0	1.1	4		06/16/20 09:32	78-87-5	
1,3,5-Trimethylbenzene	**<3.5**	ug/L	11.6	3.5	4		06/16/20 09:32	108-67-8	
1,3-Dichlorobenzene	**<2.5**	ug/L	8.4	2.5	4		06/16/20 09:32	541-73-1	
1,3-Dichloropropane	**<3.3**	ug/L	11.0	3.3	4		06/16/20 09:32	142-28-9	
1,4-Dichlorobenzene	**<3.8**	ug/L	12.6	3.8	4		06/16/20 09:32	106-46-7	
2,2-Dichloropropane	**<9.1**	ug/L	30.2	9.1	4		06/16/20 09:32	594-20-7	
2-Chlorotoluene	**<3.7**	ug/L	20.0	3.7	4		06/16/20 09:32	95-49-8	
4-Chlorotoluene	**<3.0**	ug/L	10.1	3.0	4		06/16/20 09:32	106-43-4	
Benzene	**<0.99**	ug/L	4.0	0.99	4		06/16/20 09:32	71-43-2	
Bromobenzene	**<0.96**	ug/L	4.0	0.96	4		06/16/20 09:32	108-86-1	
Bromochloromethane	**<1.4**	ug/L	20.0	1.4	4		06/16/20 09:32	74-97-5	
Bromodichloromethane	**<1.5**	ug/L	4.8	1.5	4		06/16/20 09:32	75-27-4	
Bromoform	**<15.9**	ug/L	53.0	15.9	4		06/16/20 09:32	75-25-2	
Bromomethane	**<3.9**	ug/L	20.0	3.9	4		06/16/20 09:32	74-83-9	
Carbon tetrachloride	**<4.3**	ug/L	14.4	4.3	4		06/16/20 09:32	56-23-5	
Chlorobenzene	**<2.8**	ug/L	9.5	2.8	4		06/16/20 09:32	108-90-7	
Chloroethane	**<5.4**	ug/L	20.0	5.4	4		06/16/20 09:32	75-00-3	
Chloroform	**<5.1**	ug/L	20.0	5.1	4		06/16/20 09:32	67-66-3	
Chloromethane	**<8.8**	ug/L	29.2	8.8	4		06/16/20 09:32	74-87-3	
Dibromochloromethane	**<10.4**	ug/L	34.7	10.4	4		06/16/20 09:32	124-48-1	
Dibromomethane	**<3.7**	ug/L	12.5	3.7	4		06/16/20 09:32	74-95-3	
Dichlorodifluoromethane	**<2.0**	ug/L	20.0	2.0	4		06/16/20 09:32	75-71-8	
Diisopropyl ether	**<7.6**	ug/L	25.2	7.6	4		06/16/20 09:32	108-20-3	
Ethylbenzene	**<1.3**	ug/L	4.2	1.3	4		06/16/20 09:32	100-41-4	
Hexachloro-1,3-butadiene	**<5.9**	ug/L	19.5	5.9	4		06/16/20 09:32	87-68-3	
Isopropylbenzene (Cumene)	**<6.7**	ug/L	22.5	6.7	4		06/16/20 09:32	98-82-8	
Methyl-tert-butyl ether	**<5.0**	ug/L	16.6	5.0	4		06/16/20 09:32	1634-04-4	
Methylene Chloride	**<2.3**	ug/L	20.0	2.3	4		06/16/20 09:32	75-09-2	
Naphthalene	**<4.7**	ug/L	20.0	4.7	4		06/16/20 09:32	91-20-3	
Styrene	**<12.0**	ug/L	40.1	12.0	4		06/16/20 09:32	100-42-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-24 **Lab ID: 40209482009** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Tetrachloroethene	**<1.3**	ug/L	4.4	1.3	4		06/16/20 09:32	127-18-4	
Toluene	**<1.1**	ug/L	3.6	1.1	4		06/16/20 09:32	108-88-3	
Trichloroethene	**<1.0**	ug/L	4.0	1.0	4		06/16/20 09:32	79-01-6	
Trichlorofluoromethane	**<0.86**	ug/L	4.0	0.86	4		06/16/20 09:32	75-69-4	
Vinyl chloride	**5.5**	ug/L	4.0	0.70	4		06/16/20 09:32	75-01-4	
cis-1,2-Dichloroethene	**<1.1**	ug/L	4.0	1.1	4		06/16/20 09:32	156-59-2	
cis-1,3-Dichloropropene	**<14.5**	ug/L	48.4	14.5	4		06/16/20 09:32	10061-01-5	
m&p-Xylene	**<1.9**	ug/L	8.0	1.9	4		06/16/20 09:32	179601-23-1	
n-Butylbenzene	**<2.8**	ug/L	9.4	2.8	4		06/16/20 09:32	104-51-8	
n-Propylbenzene	**<3.2**	ug/L	20.0	3.2	4		06/16/20 09:32	103-65-1	
o-Xylene	**<1.0**	ug/L	4.0	1.0	4		06/16/20 09:32	95-47-6	
p-Isopropyltoluene	**<3.2**	ug/L	10.7	3.2	4		06/16/20 09:32	99-87-6	
sec-Butylbenzene	**<3.4**	ug/L	20.0	3.4	4		06/16/20 09:32	135-98-8	
tert-Butylbenzene	**<1.2**	ug/L	4.1	1.2	4		06/16/20 09:32	98-06-6	
trans-1,2-Dichloroethene	**<1.9**	ug/L	6.2	1.9	4		06/16/20 09:32	156-60-5	
trans-1,3-Dichloropropene	**<17.5**	ug/L	58.3	17.5	4		06/16/20 09:32	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	91	%	70-130		4		06/16/20 09:32	460-00-4	
Dibromofluoromethane (S)	99	%	70-130		4		06/16/20 09:32	1868-53-7	
Toluene-d8 (S)	98	%	70-130		4		06/16/20 09:32	2037-26-5	

Sample: MW-26 **Lab ID: 40209482010** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 17:59	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:59	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:59	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 17:59	79-00-5	
1,1-Dichloroethane	**2.4**	ug/L	1.0	0.27	1		06/16/20 17:59	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:59	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 17:59	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 17:59	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 17:59	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 17:59	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 17:59	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 17:59	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 17:59	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:59	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:59	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:59	78-87-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-26 **Lab ID: 40209482010** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 17:59	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 17:59	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 17:59	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 17:59	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 17:59	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 17:59	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 17:59	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 17:59	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:59	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 17:59	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 17:59	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 17:59	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 17:59	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 17:59	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:59	108-90-7	
Chloroethane	**3.6J**	ug/L	5.0	1.3	1		06/16/20 17:59	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 17:59	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 17:59	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 17:59	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 17:59	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 17:59	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 17:59	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 17:59	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 17:59	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 17:59	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 17:59	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 17:59	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 17:59	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 17:59	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 17:59	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 17:59	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 17:59	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 17:59	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 17:59	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 17:59	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 17:59	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 17:59	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:59	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 17:59	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 17:59	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 17:59	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 17:59	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 17:59	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 17:59	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 17:59	10061-02-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-26 **Lab ID: 40209482010** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		06/16/20 17:59	460-00-4	
Dibromofluoromethane (S)	93	%	70-130		1		06/16/20 17:59	1868-53-7	
Toluene-d8 (S)	98	%	70-130		1		06/16/20 17:59	2037-26-5	

Sample: MW-402 **Lab ID: 40209482011** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		06/16/20 17:37	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:37	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:37	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		06/16/20 17:37	79-00-5	
1,1-Dichloroethane	**0.44J**	ug/L	1.0	0.27	1		06/16/20 17:37	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:37	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		06/16/20 17:37	563-58-6	
1,2,3-Trichlorobenzene	**<2.2**	ug/L	7.4	2.2	1		06/16/20 17:37	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		06/16/20 17:37	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		06/16/20 17:37	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		06/16/20 17:37	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		06/16/20 17:37	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		06/16/20 17:37	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:37	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:37	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		06/16/20 17:37	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		06/16/20 17:37	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		06/16/20 17:37	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		06/16/20 17:37	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		06/16/20 17:37	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		06/16/20 17:37	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		06/16/20 17:37	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		06/16/20 17:37	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		06/16/20 17:37	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		06/16/20 17:37	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		06/16/20 17:37	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		06/16/20 17:37	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		06/16/20 17:37	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		06/16/20 17:37	74-83-9	
Carbon tetrachloride	**<1.1**	ug/L	3.6	1.1	1		06/16/20 17:37	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:37	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		06/16/20 17:37	75-00-3	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Sample: MW-402 **Lab ID: 40209482011** Collected: 06/11/20 13:00 Received: 06/15/20 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260 Pace Analytical Services - Green Bay								
Chloroform	**<1.3**	ug/L	5.0	1.3	1		06/16/20 17:37	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		06/16/20 17:37	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		06/16/20 17:37	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		06/16/20 17:37	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		06/16/20 17:37	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		06/16/20 17:37	108-20-3	
Ethylbenzene	**<0.32**	ug/L	1.1	0.32	1		06/16/20 17:37	100-41-4	
Hexachloro-1,3-butadiene	**<1.5**	ug/L	4.9	1.5	1		06/16/20 17:37	87-68-3	
Isopropylbenzene (Cumene)	**<1.7**	ug/L	5.6	1.7	1		06/16/20 17:37	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		06/16/20 17:37	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		06/16/20 17:37	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		06/16/20 17:37	91-20-3	
Styrene	**<3.0**	ug/L	10.0	3.0	1		06/16/20 17:37	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		06/16/20 17:37	127-18-4	
Toluene	**<0.27**	ug/L	0.90	0.27	1		06/16/20 17:37	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 17:37	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		06/16/20 17:37	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		06/16/20 17:37	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		06/16/20 17:37	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		06/16/20 17:37	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		06/16/20 17:37	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		06/16/20 17:37	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		06/16/20 17:37	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		06/16/20 17:37	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		06/16/20 17:37	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		06/16/20 17:37	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		06/16/20 17:37	98-06-6	
trans-1,2-Dichloroethene	**<0.46**	ug/L	1.5	0.46	1		06/16/20 17:37	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		06/16/20 17:37	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		06/16/20 17:37	460-00-4	
Dibromofluoromethane (S)	93	%	70-130		1		06/16/20 17:37	1868-53-7	
Toluene-d8 (S)	98	%	70-130		1		06/16/20 17:37	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

QC Batch: 357687
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: 8260 MSV
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40209482001, 40209482002, 40209482003, 40209482004, 40209482005, 40209482006, 40209482007, 40209482008, 40209482009, 40209482010, 40209482011

METHOD BLANK: 2069353
Matrix: Water
Associated Lab Samples: 40209482001, 40209482002, 40209482003, 40209482004, 40209482005, 40209482006, 40209482007, 40209482008, 40209482009, 40209482010, 40209482011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.27	1.0	06/16/20 06:10	
1,1,1-Trichloroethane	ug/L	<0.24	1.0	06/16/20 06:10	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	1.0	06/16/20 06:10	
1,1,2-Trichloroethane	ug/L	<0.55	5.0	06/16/20 06:10	
1,1-Dichloroethane	ug/L	<0.27	1.0	06/16/20 06:10	
1,1-Dichloroethene	ug/L	<0.24	1.0	06/16/20 06:10	
1,1-Dichloropropene	ug/L	<0.54	1.8	06/16/20 06:10	
1,2,3-Trichlorobenzene	ug/L	<2.2	7.4	06/16/20 06:10	
1,2,3-Trichloropropane	ug/L	<0.59	5.0	06/16/20 06:10	
1,2,4-Trichlorobenzene	ug/L	<0.95	5.0	06/16/20 06:10	
1,2,4-Trimethylbenzene	ug/L	<0.84	2.8	06/16/20 06:10	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	5.9	06/16/20 06:10	
1,2-Dibromoethane (EDB)	ug/L	<0.83	2.8	06/16/20 06:10	
1,2-Dichlorobenzene	ug/L	<0.71	2.4	06/16/20 06:10	
1,2-Dichloroethane	ug/L	<0.28	1.0	06/16/20 06:10	
1,2-Dichloropropane	ug/L	<0.28	1.0	06/16/20 06:10	
1,3,5-Trimethylbenzene	ug/L	<0.87	2.9	06/16/20 06:10	
1,3-Dichlorobenzene	ug/L	<0.63	2.1	06/16/20 06:10	
1,3-Dichloropropane	ug/L	<0.83	2.8	06/16/20 06:10	
1,4-Dichlorobenzene	ug/L	<0.94	3.1	06/16/20 06:10	
2,2-Dichloropropane	ug/L	<2.3	7.6	06/16/20 06:10	
2-Chlorotoluene	ug/L	<0.93	5.0	06/16/20 06:10	
4-Chlorotoluene	ug/L	<0.76	2.5	06/16/20 06:10	
Benzene	ug/L	<0.25	1.0	06/16/20 06:10	
Bromobenzene	ug/L	<0.24	1.0	06/16/20 06:10	
Bromochloromethane	ug/L	<0.36	5.0	06/16/20 06:10	
Bromodichloromethane	ug/L	<0.36	1.2	06/16/20 06:10	
Bromoform	ug/L	<4.0	13.2	06/16/20 06:10	
Bromomethane	ug/L	<0.97	5.0	06/16/20 06:10	
Carbon tetrachloride	ug/L	<1.1	3.6	06/16/20 06:10	
Chlorobenzene	ug/L	<0.71	2.4	06/16/20 06:10	
Chloroethane	ug/L	<1.3	5.0	06/16/20 06:10	
Chloroform	ug/L	<1.3	5.0	06/16/20 06:10	
Chloromethane	ug/L	<2.2	7.3	06/16/20 06:10	
cis-1,2-Dichloroethene	ug/L	<0.27	1.0	06/16/20 06:10	
cis-1,3-Dichloropropene	ug/L	<3.6	12.1	06/16/20 06:10	
Dibromochloromethane	ug/L	<2.6	8.7	06/16/20 06:10	
Dibromomethane	ug/L	<0.94	3.1	06/16/20 06:10	
Dichlorodifluoromethane	ug/L	<0.50	5.0	06/16/20 06:10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

METHOD BLANK: 2069353 Matrix: Water

Associated Lab Samples: 40209482001, 40209482002, 40209482003, 40209482004, 40209482005, 40209482006, 40209482007, 40209482008, 40209482009, 40209482010, 40209482011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diisopropyl ether	ug/L	<1.9	6.3	06/16/20 06:10	
Ethylbenzene	ug/L	<0.32	1.1	06/16/20 06:10	
Hexachloro-1,3-butadiene	ug/L	1.8J	4.9	06/16/20 06:10	
Isopropylbenzene (Cumene)	ug/L	<1.7	5.6	06/16/20 06:10	
m&p-Xylene	ug/L	<0.47	2.0	06/16/20 06:10	
Methyl-tert-butyl ether	ug/L	<1.2	4.2	06/16/20 06:10	
Methylene Chloride	ug/L	<0.58	5.0	06/16/20 06:10	
n-Butylbenzene	ug/L	<0.71	2.4	06/16/20 06:10	
n-Propylbenzene	ug/L	<0.81	5.0	06/16/20 06:10	
Naphthalene	ug/L	<1.2	5.0	06/16/20 06:10	
o-Xylene	ug/L	<0.26	1.0	06/16/20 06:10	
p-Isopropyltoluene	ug/L	<0.80	2.7	06/16/20 06:10	
sec-Butylbenzene	ug/L	<0.85	5.0	06/16/20 06:10	
Styrene	ug/L	<3.0	10.0	06/16/20 06:10	
tert-Butylbenzene	ug/L	<0.30	1.0	06/16/20 06:10	
Tetrachloroethene	ug/L	<0.33	1.1	06/16/20 06:10	
Toluene	ug/L	<0.27	0.90	06/16/20 06:10	
trans-1,2-Dichloroethene	ug/L	<0.46	1.5	06/16/20 06:10	
trans-1,3-Dichloropropene	ug/L	<4.4	14.6	06/16/20 06:10	
Trichloroethene	ug/L	<0.26	1.0	06/16/20 06:10	
Trichlorofluoromethane	ug/L	<0.21	1.0	06/16/20 06:10	
Vinyl chloride	ug/L	<0.17	1.0	06/16/20 06:10	
4-Bromofluorobenzene (S)	%	93	70-130	06/16/20 06:10	
Dibromofluoromethane (S)	%	99	70-130	06/16/20 06:10	
Toluene-d8 (S)	%	98	70-130	06/16/20 06:10	

LABORATORY CONTROL SAMPLE: 2069354

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	44.9	90	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	47.2	94	64-131	
1,1,2-Trichloroethane	ug/L	50	48.8	98	70-130	
1,1-Dichloroethane	ug/L	50	44.7	89	69-163	
1,1-Dichloroethene	ug/L	50	43.3	87	77-123	
1,2,4-Trichlorobenzene	ug/L	50	45.4	91	68-130	
1,2-Dibromo-3-chloropropane	ug/L	50	41.6	83	63-130	
1,2-Dibromoethane (EDB)	ug/L	50	48.7	97	70-130	
1,2-Dichlorobenzene	ug/L	50	48.9	98	70-130	
1,2-Dichloroethane	ug/L	50	44.8	90	78-142	
1,2-Dichloropropane	ug/L	50	47.8	96	86-134	
1,3-Dichlorobenzene	ug/L	50	48.4	97	70-130	
1,4-Dichlorobenzene	ug/L	50	49.2	98	70-130	
Benzene	ug/L	50	45.5	91	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical®
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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

LABORATORY CONTROL SAMPLE: 2069354

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromodichloromethane	ug/L	50	50.9	102	70-130	
Bromoform	ug/L	50	47.9	96	70-130	
Bromomethane	ug/L	50	24.9	50	39-129	
Carbon tetrachloride	ug/L	50	49.0	98	70-132	
Chlorobenzene	ug/L	50	50.6	101	70-130	
Chloroethane	ug/L	50	38.5	77	66-140	
Chloroform	ug/L	50	45.2	90	75-132	
Chloromethane	ug/L	50	27.8	56	32-143	
cis-1,2-Dichloroethene	ug/L	50	45.8	92	70-130	
cis-1,3-Dichloropropene	ug/L	50	43.0	86	70-130	
Dibromochloromethane	ug/L	50	52.0	104	70-130	
Dichlorodifluoromethane	ug/L	50	20.9	42	10-141	
Ethylbenzene	ug/L	50	51.7	103	80-120	
Isopropylbenzene (Cumene)	ug/L	50	47.5	95	70-130	
m&p-Xylene	ug/L	100	106	106	70-130	
Methyl-tert-butyl ether	ug/L	50	39.7	79	61-129	
Methylene Chloride	ug/L	50	42.9	86	70-130	
o-Xylene	ug/L	50	52.4	105	70-130	
Styrene	ug/L	50	48.9	98	70-130	
Tetrachloroethene	ug/L	50	52.2	104	70-130	
Toluene	ug/L	50	50.6	101	80-120	
trans-1,2-Dichloroethene	ug/L	50	45.9	92	70-130	
trans-1,3-Dichloropropene	ug/L	50	41.6	83	69-130	
Trichloroethene	ug/L	50	50.2	100	70-130	
Trichlorofluoromethane	ug/L	50	43.3	87	75-145	
Vinyl chloride	ug/L	50	32.7	65	51-140	
4-Bromofluorobenzene (S)	%			98	70-130	
Dibromofluoromethane (S)	%			96	70-130	
Toluene-d8 (S)	%			99	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TD P3 2ND QTR GW-BROACH WELLS
Pace Project No.: 40209482

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40209482001	MW-11	EPA 8260	357687		
40209482002	MW-13	EPA 8260	357687		
40209482003	MW-14	EPA 8260	357687		
40209482004	MW-15	EPA 8260	357687		
40209482005	MW-17	EPA 8260	357687		
40209482006	MW-19	EPA 8260	357687		
40209482007	MW-22	EPA 8260	357687		
40209482008	MW-23	EPA 8260	357687		
40209482009	MW-24	EPA 8260	357687		
40209482010	MW-26	EPA 8260	357687		
40209482011	MW-402	EPA 8260	357687		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

40209482

Page: 1 of 1

Section A — Required Client Information:

Company:	Environmental Audits Inc.
Address:	11327 W Lincoln Avenue
	West Allis Wi 53051
Email To:	john@environmentalaudits.net
Phone: 414-226-5563	Fax:
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	jrruetz@yahoo.com;
Copy To:	eeriii@wi.rr.com; john@environmentalaudits.net
	steph@environmentalaudits.net
Purchase Order No.:	Verbal
Project Name:	TD P3 2nd Qtr GW – Broach Wells
Project Number:	

Section C — Invoice Information:

Attention:	John Ruetz
Company Name:	Environmental Audits Inc.
Address:	11327 W Lincoln Avenue
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER

Site Location STATE: WI

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information — SAMPLE ID (A-Z, 0-9 /,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Analysis Test: VOC	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-11	GW	G			6/11/20	1pm		3				x					Y	x		20209482001
2	MW-13	GW	G			6/11/20	1pm		3				x					Y	x		002
3	MW-14	GW	G			6/11/20	1pm		3				x					Y	x		003
4	MW-15	GW	G			6/11/20	1pm		3				x					Y	x		004
5	MW-17	GW	G			6/11/20	1pm		3				x					Y	x		005
6	MW-19	GW	G			6/11/20	1pm		3				x					Y	x		006
7	MW-22	GW	G			6/11/20	1pm		3				x					Y	x		007
8	MW-23	GW	G			6/11/20	1pm		3				x					Y	x		008
9	MW-24	GW	G			6/11/20	1pm		3				x					Y	x		009
10	MW-26	GW	G			6/11/20	1pm		3				x					Y	x		010
11	MW-402	GW	G			6/11/20	1pm		3				x					Y	x		011
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Steve Tiber	6/11/20		Mary Fanning	6/12/20	1325	
	Mary Fanning	6/12/20	1400				
	C&S Logistics	6-13-20	0915	Madelin Z Rubi Pace	6-13-20	0915	802 Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Steve Tiber

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 6/11/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Sample Preservation Receipt Form

Client Name: Environmental Audits, Inc. Project # 40209482

All containers needing preservation have been checked and noted below: ☐Yes ☐No ☐N/A

Initial when completed: Date/ Time:

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

	Glass							Plastic					Vials						Jars				General							
Pace Lab #	AG1U	BG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP3U	BP3B	BP3N	BP3S	VG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	JG9U	WGFU	WPFU	SP5T	ZPLC	GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001																																	2.5 / 5 / 10
002																																	2.5 / 5 / 10
003																																	2.5 / 5 / 10
004																																	2.5 / 5 / 10
005																																	2.5 / 5 / 10
006																																	2.5 / 5 / 10
007																																	2.5 / 5 / 10
008																																	2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm): ☐Yes ☐No ☐N/A ***If yes look in headspace column**

AG1U	1 liter amber glass
BG1U	1 liter clear glass
AG1H	1 liter amber glass HCL
AG4S	125 mL amber glass H2SO4
AG4U	120 mL amber glass unpres
AG5U	100 mL amber glass unpres
AG2S	500 mL amber glass H2SO4
BG3U	250 mL clear glass unpres

BP1U	1 liter plastic unpres
BP3U	250 mL plastic unpres
BP3B	250 mL plastic NaOH
BP3N	250 mL plastic HNO3
BP3S	250 mL plastic H2SO4

VG9A	40 mL clear ascorbic
DG9T	40 mL amber Na Thio
VG9U	40 mL clear vial unpres
VG9H	40 mL clear vial HCL
VG9M	40 mL clear vial MeOH
VG9D	40 mL clear vial DI

JGFU	4 oz amber jar unpres
JG9U	9 oz amber jar unpres
WGFU	4 oz clear jar unpres
WPFU	4 oz plastic jar unpres
SP5T	120 mL plastic Na Thiosulfate
ZPLC	ziploc bag
GN	

Pace Analytical® 1241 Bellevue Street, Green Bay, WI 54302	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: 26Mar2020
	Document No.: **ENV-FRM-GBAY-0014-Rev.00**	Author: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #:

Client Name: Environmental Audits Inc.

WO#: 40209482

Courier: ☒ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other:

Tracking #:

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other

Thermometer Used SR - n/a **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: RUT /Corr:

Temp Blank Present: ☐ yes ☒ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Person examining contents:
Date: 6-13-20 /Initials: DO
Labeled By Initials: SKW

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C if shipped on Dry Ice.

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☒No ☐N/A	2. project # DO 6/13/20
Chain of Custody Relinquished:	☐Yes ☐No ☐N/A	3. No time DO 6/13/20
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No	6.
Rush Turn Around Time Requested:	☐Yes ☒No	7.
Sufficient Volume: For Analysis: ☒Yes ☐No MS/MSD: ☐Yes ☐No ☐N/A		8.
Correct Containers Used:	☒Yes ☐No	9.
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☐Yes ☒No ☐N/A	12. no times DO 6/13/20
-Includes date/time/ID/Analysis Matrix: W		
Trip Blank Present:	☐Yes ☒No ☐N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☒N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

PM Review is documented electronically in LIMs. By releasing the project, the PM acknowledges they have reviewed the sample login

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

August 05, 2019

John Ruetz
Environmental Audits Inc
11327 W Lincoln Ave
West Allis, WI 53227

RE: Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Dear John Ruetz:
Enclosed are the analytical results for sample(s) received by the laboratory on August 01, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Ed Raymond, Environmental Audits, Inc
Steve Tiber, Environmental Audits Inc.
Stephanie Wagner, Environmental Audits, Inc.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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CERTIFICATIONS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

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SAMPLE SUMMARY

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40192195001	**MW-402 N**	Water	07/30/19 00:00	08/01/19 09:30
40192195002	**MW-11**	Water	07/30/19 00:00	08/01/19 09:30
40192195003	**MW-12**	Water	07/30/19 00:00	08/01/19 09:30
40192195004	**MW-13**	Water	07/30/19 00:00	08/01/19 09:30
40192195005	**MW-15**	Water	07/30/19 00:00	08/01/19 09:30
40192195006	**MW-19**	Water	07/30/19 00:00	08/01/19 09:30
40192195007	**MW-26**	Water	07/30/19 00:00	08/01/19 09:30

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SAMPLE ANALYTE COUNT

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40192195001	MW-402 N	WI MOD DRO	MRN	1
		EPA 8260	LAP	64
40192195002	MW-11	WI MOD DRO	MRN	1
		EPA 8260	LAP	64
40192195003	MW-12	EPA 8260	LAP	64
40192195004	MW-13	WI MOD DRO	MRN	1
		EPA 8260	LAP	64
40192195005	MW-15	WI MOD DRO	MRN	1
		EPA 8260	LAP	64
40192195006	MW-19	WI MOD DRO	MRN	1
		EPA 8260	LAP	64
40192195007	MW-26	WI MOD DRO	MRN	1
		EPA 8260	LAP	64

Pace Analytical Services, LLC
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Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-402 N **Lab ID: 40192195001** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**0.039J**	mg/L	0.050	0.015	1	08/02/19 08:51	08/05/19 11:58		
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		08/02/19 10:40	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		08/02/19 10:40	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 10:40	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		08/02/19 10:40	79-00-5	
1,1-Dichloroethane	**0.31J**	ug/L	1.0	0.27	1		08/02/19 10:40	75-34-3	M1,R1
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 10:40	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		08/02/19 10:40	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		08/02/19 10:40	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		08/02/19 10:40	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		08/02/19 10:40	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		08/02/19 10:40	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		08/02/19 10:40	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		08/02/19 10:40	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 10:40	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 10:40	107-06-2	M1
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 10:40	78-87-5	M1
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		08/02/19 10:40	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		08/02/19 10:40	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		08/02/19 10:40	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		08/02/19 10:40	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		08/02/19 10:40	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		08/02/19 10:40	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		08/02/19 10:40	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		08/02/19 10:40	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 10:40	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		08/02/19 10:40	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		08/02/19 10:40	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		08/02/19 10:40	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		08/02/19 10:40	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 10:40	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 10:40	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		08/02/19 10:40	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		08/02/19 10:40	67-66-3	M1
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		08/02/19 10:40	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		08/02/19 10:40	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		08/02/19 10:40	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		08/02/19 10:40	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		08/02/19 10:40	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		08/02/19 10:40	100-41-4	M1
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 10:40	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		08/02/19 10:40	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		08/02/19 10:40	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		08/02/19 10:40	75-09-2	M1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-402 N **Lab ID: 40192195001** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 10:40	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		08/02/19 10:40	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		08/02/19 10:40	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		08/02/19 10:40	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 10:40	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		08/02/19 10:40	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 10:40	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		08/02/19 10:40	156-59-2	M1,R1
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		08/02/19 10:40	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		08/02/19 10:40	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 10:40	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		08/02/19 10:40	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 10:40	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		08/02/19 10:40	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		08/02/19 10:40	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		08/02/19 10:40	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		08/02/19 10:40	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		08/02/19 10:40	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	70-130		1		08/02/19 10:40	460-00-4	
Dibromofluoromethane (S)	100	%	70-130		1		08/02/19 10:40	1868-53-7	
Toluene-d8 (S)	95	%	70-130		1		08/02/19 10:40	2037-26-5	

Sample: MW-11 **Lab ID: 40192195002** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**0.62**	mg/L	0.050	0.015	1	08/02/19 08:51	08/05/19 12:07		DC
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.54**	ug/L	2.0	0.54	2		08/05/19 10:13	630-20-6	
1,1,1-Trichloroethane	**8.3**	ug/L	2.0	0.49	2		08/05/19 10:13	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.55**	ug/L	2.0	0.55	2		08/05/19 10:13	79-34-5	
1,1,2-Trichloroethane	**<1.1**	ug/L	10.0	1.1	2		08/05/19 10:13	79-00-5	
1,1-Dichloroethane	**40.5**	ug/L	2.0	0.55	2		08/05/19 10:13	75-34-3	
1,1-Dichloroethene	**1.2J**	ug/L	2.0	0.49	2		08/05/19 10:13	75-35-4	
1,1-Dichloropropene	**<1.1**	ug/L	3.6	1.1	2		08/05/19 10:13	563-58-6	
1,2,3-Trichlorobenzene	**<1.3**	ug/L	10.0	1.3	2		08/05/19 10:13	87-61-6	
1,2,3-Trichloropropane	**<1.2**	ug/L	10.0	1.2	2		08/05/19 10:13	96-18-4	
1,2,4-Trichlorobenzene	**<1.9**	ug/L	10.0	1.9	2		08/05/19 10:13	120-82-1	
1,2,4-Trimethylbenzene	**<1.7**	ug/L	5.6	1.7	2		08/05/19 10:13	95-63-6	
1,2-Dibromo-3-chloropropane	**<3.5**	ug/L	11.8	3.5	2		08/05/19 10:13	96-12-8	
1,2-Dibromoethane (EDB)	**<1.7**	ug/L	5.5	1.7	2		08/05/19 10:13	106-93-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-11 **Lab ID: 40192195002** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,2-Dichlorobenzene	**<1.4**	ug/L	4.7	1.4	2		08/05/19 10:13	95-50-1	
1,2-Dichloroethane	**<0.56**	ug/L	2.0	0.56	2		08/05/19 10:13	107-06-2	
1,2-Dichloropropane	**<0.57**	ug/L	2.0	0.57	2		08/05/19 10:13	78-87-5	
1,3,5-Trimethylbenzene	**<1.7**	ug/L	5.8	1.7	2		08/05/19 10:13	108-67-8	
1,3-Dichlorobenzene	**<1.3**	ug/L	4.2	1.3	2		08/05/19 10:13	541-73-1	
1,3-Dichloropropane	**<1.7**	ug/L	5.5	1.7	2		08/05/19 10:13	142-28-9	
1,4-Dichlorobenzene	**<1.9**	ug/L	6.3	1.9	2		08/05/19 10:13	106-46-7	
2,2-Dichloropropane	**<4.5**	ug/L	15.1	4.5	2		08/05/19 10:13	594-20-7	
2-Chlorotoluene	**<1.9**	ug/L	10.0	1.9	2		08/05/19 10:13	95-49-8	
4-Chlorotoluene	**<1.5**	ug/L	5.0	1.5	2		08/05/19 10:13	106-43-4	
Benzene	**<0.49**	ug/L	2.0	0.49	2		08/05/19 10:13	71-43-2	
Bromobenzene	**<0.48**	ug/L	2.0	0.48	2		08/05/19 10:13	108-86-1	
Bromochloromethane	**<0.72**	ug/L	10.0	0.72	2		08/05/19 10:13	74-97-5	
Bromodichloromethane	**<0.73**	ug/L	2.4	0.73	2		08/05/19 10:13	75-27-4	
Bromoform	**<7.9**	ug/L	26.5	7.9	2		08/05/19 10:13	75-25-2	
Bromomethane	**<1.9**	ug/L	10.0	1.9	2		08/05/19 10:13	74-83-9	
Carbon tetrachloride	**<0.33**	ug/L	2.0	0.33	2		08/05/19 10:13	56-23-5	
Chlorobenzene	**<1.4**	ug/L	4.7	1.4	2		08/05/19 10:13	108-90-7	
Chloroethane	**41.0**	ug/L	10.0	2.7	2		08/05/19 10:13	75-00-3	
Chloroform	**<2.5**	ug/L	10.0	2.5	2		08/05/19 10:13	67-66-3	
Chloromethane	**<4.4**	ug/L	14.6	4.4	2		08/05/19 10:13	74-87-3	
Dibromochloromethane	**<5.2**	ug/L	17.3	5.2	2		08/05/19 10:13	124-48-1	
Dibromomethane	**<1.9**	ug/L	6.2	1.9	2		08/05/19 10:13	74-95-3	
Dichlorodifluoromethane	**<1.0**	ug/L	10.0	1.0	2		08/05/19 10:13	75-71-8	
Diisopropyl ether	**<3.8**	ug/L	12.6	3.8	2		08/05/19 10:13	108-20-3	
Ethylbenzene	**<0.44**	ug/L	2.0	0.44	2		08/05/19 10:13	100-41-4	
Hexachloro-1,3-butadiene	**<2.4**	ug/L	10.0	2.4	2		08/05/19 10:13	87-68-3	
Isopropylbenzene (Cumene)	**<0.79**	ug/L	10.0	0.79	2		08/05/19 10:13	98-82-8	
Methyl-tert-butyl ether	**<2.5**	ug/L	8.3	2.5	2		08/05/19 10:13	1634-04-4	
Methylene Chloride	**<1.2**	ug/L	10.0	1.2	2		08/05/19 10:13	75-09-2	
Naphthalene	**<2.4**	ug/L	10.0	2.4	2		08/05/19 10:13	91-20-3	
Styrene	**<0.93**	ug/L	3.1	0.93	2		08/05/19 10:13	100-42-5	
Tetrachloroethene	**2.8**	ug/L	2.2	0.65	2		08/05/19 10:13	127-18-4	
Toluene	**<0.34**	ug/L	10.0	0.34	2		08/05/19 10:13	108-88-3	
Trichloroethene	**4.8**	ug/L	2.0	0.51	2		08/05/19 10:13	79-01-6	
Trichlorofluoromethane	**<0.43**	ug/L	2.0	0.43	2		08/05/19 10:13	75-69-4	
Vinyl chloride	**2.0**	ug/L	2.0	0.35	2		08/05/19 10:13	75-01-4	
cis-1,2-Dichloroethene	**143**	ug/L	2.0	0.54	2		08/05/19 10:13	156-59-2	
cis-1,3-Dichloropropene	**<7.3**	ug/L	24.2	7.3	2		08/05/19 10:13	10061-01-5	
m&p-Xylene	**<0.93**	ug/L	4.0	0.93	2		08/05/19 10:13	179601-23-1	
n-Butylbenzene	**<1.4**	ug/L	4.7	1.4	2		08/05/19 10:13	104-51-8	
n-Propylbenzene	**<1.6**	ug/L	10.0	1.6	2		08/05/19 10:13	103-65-1	
o-Xylene	**<0.52**	ug/L	2.0	0.52	2		08/05/19 10:13	95-47-6	
p-Isopropyltoluene	**<1.6**	ug/L	5.3	1.6	2		08/05/19 10:13	99-87-6	
sec-Butylbenzene	**<1.7**	ug/L	10.0	1.7	2		08/05/19 10:13	135-98-8	
tert-Butylbenzene	**<0.61**	ug/L	2.0	0.61	2		08/05/19 10:13	98-06-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-11 **Lab ID: 40192195002** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
trans-1,2-Dichloroethene	**7.6**	ug/L	7.3	2.2	2		08/05/19 10:13	156-60-5	
trans-1,3-Dichloropropene	**<8.7**	ug/L	29.1	8.7	2		08/05/19 10:13	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		2		08/05/19 10:13	460-00-4	
Dibromofluoromethane (S)	106	%	70-130		2		08/05/19 10:13	1868-53-7	
Toluene-d8 (S)	94	%	70-130		2		08/05/19 10:13	2037-26-5	

Sample: MW-12 **Lab ID: 40192195003** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		08/02/19 12:58	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		08/02/19 12:58	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 12:58	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		08/02/19 12:58	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		08/02/19 12:58	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 12:58	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		08/02/19 12:58	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		08/02/19 12:58	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		08/02/19 12:58	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		08/02/19 12:58	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		08/02/19 12:58	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		08/02/19 12:58	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		08/02/19 12:58	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 12:58	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 12:58	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 12:58	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		08/02/19 12:58	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		08/02/19 12:58	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		08/02/19 12:58	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		08/02/19 12:58	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		08/02/19 12:58	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		08/02/19 12:58	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		08/02/19 12:58	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		08/02/19 12:58	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 12:58	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		08/02/19 12:58	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		08/02/19 12:58	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		08/02/19 12:58	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		08/02/19 12:58	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 12:58	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 12:58	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		08/02/19 12:58	75-00-3	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-12 **Lab ID: 40192195003** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Chloroform	**<1.3**	ug/L	5.0	1.3	1		08/02/19 12:58	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		08/02/19 12:58	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		08/02/19 12:58	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		08/02/19 12:58	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		08/02/19 12:58	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		08/02/19 12:58	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		08/02/19 12:58	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 12:58	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		08/02/19 12:58	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		08/02/19 12:58	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		08/02/19 12:58	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 12:58	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		08/02/19 12:58	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		08/02/19 12:58	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		08/02/19 12:58	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 12:58	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		08/02/19 12:58	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 12:58	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		08/02/19 12:58	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		08/02/19 12:58	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		08/02/19 12:58	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 12:58	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		08/02/19 12:58	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 12:58	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		08/02/19 12:58	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		08/02/19 12:58	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		08/02/19 12:58	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		08/02/19 12:58	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		08/02/19 12:58	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	95	%	70-130		1		08/02/19 12:58	460-00-4	
Dibromofluoromethane (S)	101	%	70-130		1		08/02/19 12:58	1868-53-7	
Toluene-d8 (S)	95	%	70-130		1		08/02/19 12:58	2037-26-5	

Sample: MW-13 **Lab ID: 40192195004** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**0.17**	mg/L	0.051	0.015	1	08/02/19 08:51	08/05/19 12:16		DC
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		08/02/19 13:20	630-20-6	
1,1,1-Trichloroethane	**0.39J**	ug/L	1.0	0.24	1		08/02/19 13:20	71-55-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-13 **Lab ID: 40192195004** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 13:20	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		08/02/19 13:20	79-00-5	
1,1-Dichloroethane	**1.2**	ug/L	1.0	0.27	1		08/02/19 13:20	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 13:20	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		08/02/19 13:20	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		08/02/19 13:20	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		08/02/19 13:20	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		08/02/19 13:20	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		08/02/19 13:20	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		08/02/19 13:20	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		08/02/19 13:20	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 13:20	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 13:20	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 13:20	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		08/02/19 13:20	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		08/02/19 13:20	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		08/02/19 13:20	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		08/02/19 13:20	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		08/02/19 13:20	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		08/02/19 13:20	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		08/02/19 13:20	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		08/02/19 13:20	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 13:20	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		08/02/19 13:20	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		08/02/19 13:20	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		08/02/19 13:20	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		08/02/19 13:20	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 13:20	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 13:20	108-90-7	
Chloroethane	**1.7J**	ug/L	5.0	1.3	1		08/02/19 13:20	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		08/02/19 13:20	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		08/02/19 13:20	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		08/02/19 13:20	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		08/02/19 13:20	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		08/02/19 13:20	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		08/02/19 13:20	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		08/02/19 13:20	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 13:20	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		08/02/19 13:20	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		08/02/19 13:20	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		08/02/19 13:20	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 13:20	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		08/02/19 13:20	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		08/02/19 13:20	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		08/02/19 13:20	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 13:20	79-01-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-13 **Lab ID: 40192195004** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		08/02/19 13:20	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 13:20	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		08/02/19 13:20	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		08/02/19 13:20	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		08/02/19 13:20	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 13:20	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		08/02/19 13:20	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 13:20	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		08/02/19 13:20	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		08/02/19 13:20	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		08/02/19 13:20	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		08/02/19 13:20	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		08/02/19 13:20	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	70-130		1		08/02/19 13:20	460-00-4	
Dibromofluoromethane (S)	95	%	70-130		1		08/02/19 13:20	1868-53-7	
Toluene-d8 (S)	93	%	70-130		1		08/02/19 13:20	2037-26-5	

Sample: MW-15 **Lab ID: 40192195005** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**0.058**	mg/L	0.051	0.015	1	08/02/19 08:51	08/05/19 12:25		DC
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		08/02/19 11:02	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		08/02/19 11:02	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 11:02	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		08/02/19 11:02	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		08/02/19 11:02	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 11:02	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		08/02/19 11:02	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		08/02/19 11:02	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		08/02/19 11:02	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		08/02/19 11:02	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		08/02/19 11:02	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		08/02/19 11:02	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		08/02/19 11:02	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 11:02	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 11:02	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 11:02	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		08/02/19 11:02	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		08/02/19 11:02	541-73-1	

REPORT OF LABORATORY ANALYSIS

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(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-15 **Lab ID: 40192195005** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		08/02/19 11:02	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		08/02/19 11:02	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		08/02/19 11:02	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		08/02/19 11:02	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		08/02/19 11:02	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		08/02/19 11:02	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 11:02	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		08/02/19 11:02	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		08/02/19 11:02	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		08/02/19 11:02	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		08/02/19 11:02	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 11:02	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 11:02	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		08/02/19 11:02	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		08/02/19 11:02	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		08/02/19 11:02	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		08/02/19 11:02	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		08/02/19 11:02	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		08/02/19 11:02	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		08/02/19 11:02	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		08/02/19 11:02	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 11:02	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		08/02/19 11:02	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		08/02/19 11:02	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		08/02/19 11:02	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 11:02	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		08/02/19 11:02	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		08/02/19 11:02	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		08/02/19 11:02	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 11:02	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		08/02/19 11:02	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 11:02	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		08/02/19 11:02	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		08/02/19 11:02	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		08/02/19 11:02	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 11:02	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		08/02/19 11:02	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 11:02	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		08/02/19 11:02	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		08/02/19 11:02	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		08/02/19 11:02	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		08/02/19 11:02	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		08/02/19 11:02	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		08/02/19 11:02	460-00-4	
Dibromofluoromethane (S)	98	%	70-130		1		08/02/19 11:02	1868-53-7	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-15 **Lab ID: 40192195005** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Surrogates									
Toluene-d8 (S)	95	%	70-130		1		08/02/19 11:02	2037-26-5	

Sample: MW-19 **Lab ID: 40192195006** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**0.18**	mg/L	0.050	0.015	1	08/02/19 08:51	08/05/19 12:34		DC
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		08/02/19 11:29	630-20-6	
1,1,1-Trichloroethane	**0.77J**	ug/L	1.0	0.24	1		08/02/19 11:29	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 11:29	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		08/02/19 11:29	79-00-5	
1,1-Dichloroethane	**2.6**	ug/L	1.0	0.27	1		08/02/19 11:29	75-34-3	
1,1-Dichloroethene	**0.27J**	ug/L	1.0	0.24	1		08/02/19 11:29	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		08/02/19 11:29	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		08/02/19 11:29	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		08/02/19 11:29	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		08/02/19 11:29	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		08/02/19 11:29	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		08/02/19 11:29	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		08/02/19 11:29	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 11:29	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 11:29	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		08/02/19 11:29	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		08/02/19 11:29	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		08/02/19 11:29	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		08/02/19 11:29	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		08/02/19 11:29	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		08/02/19 11:29	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		08/02/19 11:29	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		08/02/19 11:29	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		08/02/19 11:29	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		08/02/19 11:29	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		08/02/19 11:29	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		08/02/19 11:29	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		08/02/19 11:29	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		08/02/19 11:29	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 11:29	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 11:29	108-90-7	
Chloroethane	**2.6J**	ug/L	5.0	1.3	1		08/02/19 11:29	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		08/02/19 11:29	67-66-3	

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ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-19 **Lab ID: 40192195006** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		08/02/19 11:29	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		08/02/19 11:29	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		08/02/19 11:29	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		08/02/19 11:29	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		08/02/19 11:29	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		08/02/19 11:29	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 11:29	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		08/02/19 11:29	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		08/02/19 11:29	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		08/02/19 11:29	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		08/02/19 11:29	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		08/02/19 11:29	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		08/02/19 11:29	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		08/02/19 11:29	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 11:29	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		08/02/19 11:29	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		08/02/19 11:29	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		08/02/19 11:29	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		08/02/19 11:29	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		08/02/19 11:29	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		08/02/19 11:29	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		08/02/19 11:29	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		08/02/19 11:29	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		08/02/19 11:29	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		08/02/19 11:29	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		08/02/19 11:29	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		08/02/19 11:29	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		08/02/19 11:29	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	95	%	70-130		1		08/02/19 11:29	460-00-4	
Dibromofluoromethane (S)	97	%	70-130		1		08/02/19 11:29	1868-53-7	
Toluene-d8 (S)	94	%	70-130		1		08/02/19 11:29	2037-26-5	

Sample: MW-26 **Lab ID: 40192195007** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
WIDRO GCS	Analytical Method: WI MOD DRO Preparation Method: WI MOD DRO								
Diesel Range Organics	**0.34**	mg/L	0.050	0.015	1	08/02/19 08:51	08/05/19 12:44		DC
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		08/05/19 09:28	630-20-6	
1,1,1-Trichloroethane	**0.31J**	ug/L	1.0	0.24	1		08/05/19 09:28	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		08/05/19 09:28	79-34-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-26 **Lab ID: 40192195007** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		08/05/19 09:28	79-00-5	
1,1-Dichloroethane	**0.74J**	ug/L	1.0	0.27	1		08/05/19 09:28	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		08/05/19 09:28	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		08/05/19 09:28	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		08/05/19 09:28	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		08/05/19 09:28	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		08/05/19 09:28	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		08/05/19 09:28	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		08/05/19 09:28	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		08/05/19 09:28	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/05/19 09:28	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		08/05/19 09:28	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		08/05/19 09:28	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		08/05/19 09:28	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		08/05/19 09:28	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		08/05/19 09:28	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		08/05/19 09:28	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		08/05/19 09:28	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		08/05/19 09:28	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		08/05/19 09:28	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		08/05/19 09:28	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		08/05/19 09:28	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		08/05/19 09:28	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		08/05/19 09:28	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		08/05/19 09:28	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		08/05/19 09:28	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		08/05/19 09:28	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		08/05/19 09:28	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		08/05/19 09:28	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		08/05/19 09:28	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		08/05/19 09:28	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		08/05/19 09:28	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		08/05/19 09:28	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		08/05/19 09:28	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		08/05/19 09:28	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		08/05/19 09:28	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		08/05/19 09:28	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		08/05/19 09:28	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		08/05/19 09:28	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		08/05/19 09:28	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		08/05/19 09:28	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		08/05/19 09:28	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		08/05/19 09:28	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		08/05/19 09:28	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		08/05/19 09:28	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		08/05/19 09:28	75-69-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Sample: MW-26 **Lab ID: 40192195007** Collected: 07/30/19 00:00 Received: 08/01/19 09:30 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		08/05/19 09:28	75-01-4	
cis-1,2-Dichloroethene	**0.87J**	ug/L	1.0	0.27	1		08/05/19 09:28	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		08/05/19 09:28	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		08/05/19 09:28	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		08/05/19 09:28	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		08/05/19 09:28	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		08/05/19 09:28	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		08/05/19 09:28	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		08/05/19 09:28	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		08/05/19 09:28	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		08/05/19 09:28	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		08/05/19 09:28	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		08/05/19 09:28	460-00-4	
Dibromofluoromethane (S)	97	%	70-130		1		08/05/19 09:28	1868-53-7	
Toluene-d8 (S)	93	%	70-130		1		08/05/19 09:28	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

QC Batch: 329444 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 40192195001, 40192195002, 40192195003, 40192195004, 40192195005, 40192195006, 40192195007

METHOD BLANK: 1911602 Matrix: Water
Associated Lab Samples: 40192195001, 40192195002, 40192195003, 40192195004, 40192195005, 40192195006, 40192195007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.27	1.0	08/02/19 08:01	
1,1,1-Trichloroethane	ug/L	<0.24	1.0	08/02/19 08:01	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	1.0	08/02/19 08:01	
1,1,2-Trichloroethane	ug/L	<0.55	5.0	08/02/19 08:01	
1,1-Dichloroethane	ug/L	<0.27	1.0	08/02/19 08:01	
1,1-Dichloroethene	ug/L	<0.24	1.0	08/02/19 08:01	
1,1-Dichloropropene	ug/L	<0.54	1.8	08/02/19 08:01	
1,2,3-Trichlorobenzene	ug/L	<0.63	5.0	08/02/19 08:01	
1,2,3-Trichloropropane	ug/L	<0.59	5.0	08/02/19 08:01	
1,2,4-Trichlorobenzene	ug/L	<0.95	5.0	08/02/19 08:01	
1,2,4-Trimethylbenzene	ug/L	<0.84	2.8	08/02/19 08:01	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	5.9	08/02/19 08:01	
1,2-Dibromoethane (EDB)	ug/L	<0.83	2.8	08/02/19 08:01	
1,2-Dichlorobenzene	ug/L	<0.71	2.4	08/02/19 08:01	
1,2-Dichloroethane	ug/L	<0.28	1.0	08/02/19 08:01	
1,2-Dichloropropane	ug/L	<0.28	1.0	08/02/19 08:01	
1,3,5-Trimethylbenzene	ug/L	<0.87	2.9	08/02/19 08:01	
1,3-Dichlorobenzene	ug/L	<0.63	2.1	08/02/19 08:01	
1,3-Dichloropropane	ug/L	<0.83	2.8	08/02/19 08:01	
1,4-Dichlorobenzene	ug/L	<0.94	3.1	08/02/19 08:01	
2,2-Dichloropropane	ug/L	<2.3	7.6	08/02/19 08:01	
2-Chlorotoluene	ug/L	<0.93	5.0	08/02/19 08:01	
4-Chlorotoluene	ug/L	<0.76	2.5	08/02/19 08:01	
Benzene	ug/L	<0.25	1.0	08/02/19 08:01	
Bromobenzene	ug/L	<0.24	1.0	08/02/19 08:01	
Bromochloromethane	ug/L	<0.36	5.0	08/02/19 08:01	
Bromodichloromethane	ug/L	<0.36	1.2	08/02/19 08:01	
Bromoform	ug/L	<4.0	13.2	08/02/19 08:01	
Bromomethane	ug/L	<0.97	5.0	08/02/19 08:01	
Carbon tetrachloride	ug/L	<0.17	1.0	08/02/19 08:01	
Chlorobenzene	ug/L	<0.71	2.4	08/02/19 08:01	
Chloroethane	ug/L	<1.3	5.0	08/02/19 08:01	
Chloroform	ug/L	<1.3	5.0	08/02/19 08:01	
Chloromethane	ug/L	<2.2	7.3	08/02/19 08:01	
cis-1,2-Dichloroethene	ug/L	<0.27	1.0	08/02/19 08:01	
cis-1,3-Dichloropropene	ug/L	<3.6	12.1	08/02/19 08:01	
Dibromochloromethane	ug/L	<2.6	8.7	08/02/19 08:01	
Dibromomethane	ug/L	<0.94	3.1	08/02/19 08:01	
Dichlorodifluoromethane	ug/L	<0.50	5.0	08/02/19 08:01	
Diisopropyl ether	ug/L	<1.9	6.3	08/02/19 08:01	
Ethylbenzene	ug/L	<0.22	1.0	08/02/19 08:01	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

METHOD BLANK: 1911602 Matrix: Water
Associated Lab Samples: 40192195001, 40192195002, 40192195003, 40192195004, 40192195005, 40192195006, 40192195007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Hexachloro-1,3-butadiene	ug/L	<1.2	5.0	08/02/19 08:01	
Isopropylbenzene (Cumene)	ug/L	<0.39	5.0	08/02/19 08:01	
m&p-Xylene	ug/L	<0.47	2.0	08/02/19 08:01	
Methyl-tert-butyl ether	ug/L	<1.2	4.2	08/02/19 08:01	
Methylene Chloride	ug/L	<0.58	5.0	08/02/19 08:01	
n-Butylbenzene	ug/L	<0.71	2.4	08/02/19 08:01	
n-Propylbenzene	ug/L	<0.81	5.0	08/02/19 08:01	
Naphthalene	ug/L	<1.2	5.0	08/02/19 08:01	
o-Xylene	ug/L	<0.26	1.0	08/02/19 08:01	
p-Isopropyltoluene	ug/L	<0.80	2.7	08/02/19 08:01	
sec-Butylbenzene	ug/L	<0.85	5.0	08/02/19 08:01	
Styrene	ug/L	<0.47	1.6	08/02/19 08:01	
tert-Butylbenzene	ug/L	<0.30	1.0	08/02/19 08:01	
Tetrachloroethene	ug/L	<0.33	1.1	08/02/19 08:01	
Toluene	ug/L	<0.17	5.0	08/02/19 08:01	
trans-1,2-Dichloroethene	ug/L	<1.1	3.6	08/02/19 08:01	
trans-1,3-Dichloropropene	ug/L	<4.4	14.6	08/02/19 08:01	
Trichloroethene	ug/L	<0.26	1.0	08/02/19 08:01	
Trichlorofluoromethane	ug/L	<0.21	1.0	08/02/19 08:01	
Vinyl chloride	ug/L	<0.17	1.0	08/02/19 08:01	
4-Bromofluorobenzene (S)	%	91	70-130	08/02/19 08:01	
Dibromofluoromethane (S)	%	104	70-130	08/02/19 08:01	
Toluene-d8 (S)	%	96	70-130	08/02/19 08:01	

LABORATORY CONTROL SAMPLE: 1911603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	62.7	125	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	56.5	113	70-130	
1,1,2-Trichloroethane	ug/L	50	54.9	110	70-130	
1,1-Dichloroethane	ug/L	50	50.5	101	73-150	
1,1-Dichloroethene	ug/L	50	55.6	111	73-138	
1,2,4-Trichlorobenzene	ug/L	50	58.5	117	70-130	
1,2-Dibromo-3-chloropropane	ug/L	50	55.3	111	64-129	
1,2-Dibromoethane (EDB)	ug/L	50	54.5	109	70-130	
1,2-Dichlorobenzene	ug/L	50	54.1	108	70-130	
1,2-Dichloroethane	ug/L	50	56.8	114	75-140	
1,2-Dichloropropane	ug/L	50	50.2	100	73-135	
1,3-Dichlorobenzene	ug/L	50	53.6	107	70-130	
1,4-Dichlorobenzene	ug/L	50	54.6	109	70-130	
Benzene	ug/L	50	58.6	117	70-130	
Bromodichloromethane	ug/L	50	57.6	115	70-130	
Bromoform	ug/L	50	55.6	111	68-129	
Bromomethane	ug/L	50	36.8	74	18-159	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

LABORATORY CONTROL SAMPLE: 1911603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbon tetrachloride	ug/L	50	65.0	130	70-130	
Chlorobenzene	ug/L	50	55.7	111	70-130	
Chloroethane	ug/L	50	50.1	100	53-147	
Chloroform	ug/L	50	58.1	116	74-136	
Chloromethane	ug/L	50	40.3	81	29-115	
cis-1,2-Dichloroethene	ug/L	50	52.5	105	70-130	
cis-1,3-Dichloropropene	ug/L	50	61.9	124	70-130	
Dibromochloromethane	ug/L	50	52.5	105	70-130	
Dichlorodifluoromethane	ug/L	50	45.1	90	10-130	
Ethylbenzene	ug/L	50	58.5	117	80-124	
Isopropylbenzene (Cumene)	ug/L	50	61.6	123	70-130	
m&p-Xylene	ug/L	100	120	120	70-130	
Methyl-tert-butyl ether	ug/L	50	59.2	118	54-137	
Methylene Chloride	ug/L	50	52.3	105	73-138	
o-Xylene	ug/L	50	58.4	117	70-130	
Styrene	ug/L	50	59.3	119	70-130	
Tetrachloroethene	ug/L	50	59.8	120	70-130	
Toluene	ug/L	50	58.7	117	80-126	
trans-1,2-Dichloroethene	ug/L	50	57.4	115	73-145	
trans-1,3-Dichloropropene	ug/L	50	55.4	111	70-130	
Trichloroethene	ug/L	50	58.7	117	70-130	
Trichlorofluoromethane	ug/L	50	60.5	121	76-147	
Vinyl chloride	ug/L	50	48.8	98	51-120	
4-Bromofluorobenzene (S)	%			102	70-130	
Dibromofluoromethane (S)	%			100	70-130	
Toluene-d8 (S)	%			100	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1911830 1911831

Parameter	Units	40192195001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	<0.24	50	50	47.0	40.4	94	81	70-130	15	20	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	50	50	45.9	37.6	92	75	70-130	20	20	
1,1,2-Trichloroethane	ug/L	<0.55	50	50	40.6	37.4	81	75	70-137	8	20	
1,1-Dichloroethane	ug/L	0.31J	50	50	39.4	31.2	78	62	73-153	23	20	M1,R1
1,1-Dichloroethene	ug/L	<0.24	50	50	41.5	36.3	83	73	73-138	14	20	
1,2,4-Trichlorobenzene	ug/L	<0.95	50	50	46.5	40.1	93	80	70-130	15	20	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	50	50	42.7	36.6	85	73	58-129	15	20	
1,2-Dibromoethane (EDB)	ug/L	<0.83	50	50	41.4	37.1	83	74	70-130	11	20	
1,2-Dichlorobenzene	ug/L	<0.71	50	50	43.2	36.1	86	72	70-130	18	20	
1,2-Dichloroethane	ug/L	<0.28	50	50	42.5	35.4	85	71	75-140	18	20	M1
1,2-Dichloropropane	ug/L	<0.28	50	50	38.3	31.2	77	62	71-138	20	20	M1
1,3-Dichlorobenzene	ug/L	<0.63	50	50	41.7	36.0	83	72	70-130	15	20	
1,4-Dichlorobenzene	ug/L	<0.94	50	50	42.8	35.7	86	71	70-130	18	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1911830 1911831

Parameter	Units	40192195001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	<0.25	50	50	43.9	36.0	88	72	70-130	20	20	
Bromodichloromethane	ug/L	<0.36	50	50	44.0	41.5	88	83	70-130	6	20	
Bromoform	ug/L	<4.0	50	50	41.9	36.6	84	73	68-129	14	20	
Bromomethane	ug/L	<0.97	50	50	34.0	28.8	68	58	15-170	17	20	
Carbon tetrachloride	ug/L	<0.17	50	50	49.9	42.1	100	84	70-130	17	20	
Chlorobenzene	ug/L	<0.71	50	50	42.0	38.3	84	77	70-130	9	20	
Chloroethane	ug/L	<1.3	50	50	39.8	35.4	78	70	51-148	12	20	
Chloroform	ug/L	<1.3	50	50	44.1	36.5	88	73	74-136	19	20	M1
Chloromethane	ug/L	<2.2	50	50	30.2	26.6	60	53	23-115	13	20	
cis-1,2-Dichloroethene	ug/L	<0.27	50	50	43.3	33.8	87	68	70-131	25	20	M1,R1
cis-1,3-Dichloropropene	ug/L	<3.6	50	50	46.4	41.3	93	83	70-130	12	20	
Dibromochloromethane	ug/L	<2.6	50	50	40.6	35.7	81	71	70-130	13	20	
Dichlorodifluoromethane	ug/L	<0.50	50	50	35.5	30.5	71	61	10-132	15	20	
Ethylbenzene	ug/L	<0.22	50	50	43.7	39.0	87	78	80-125	11	20	M1
Isopropylbenzene (Cumene)	ug/L	<0.39	50	50	45.8	40.6	92	81	70-130	12	20	
m&p-Xylene	ug/L	<0.47	100	100	88.4	80.0	88	80	70-130	10	20	
Methyl-tert-butyl ether	ug/L	<1.2	50	50	44.5	36.5	89	73	51-145	20	20	
Methylene Chloride	ug/L	<0.58	50	50	39.4	34.6	79	69	73-140	13	20	M1
o-Xylene	ug/L	<0.26	50	50	42.4	37.2	85	74	70-130	13	20	
Styrene	ug/L	<0.47	50	50	44.0	39.1	88	78	70-130	12	20	
Tetrachloroethene	ug/L	<0.33	50	50	45.9	41.2	92	82	70-130	11	20	
Toluene	ug/L	<0.17	50	50	45.0	40.0	90	80	80-131	12	20	
trans-1,2-Dichloroethene	ug/L	<1.1	50	50	43.7	37.4	87	75	73-148	16	20	
trans-1,3-Dichloropropene	ug/L	<4.4	50	50	41.6	36.4	83	73	70-130	13	20	
Trichloroethene	ug/L	<0.26	50	50	44.2	37.8	88	76	70-130	16	20	
Trichlorofluoromethane	ug/L	<0.21	50	50	44.3	40.1	89	80	74-147	10	20	
Vinyl chloride	ug/L	<0.17	50	50	38.7	32.4	77	65	41-129	18	20	
4-Bromofluorobenzene (S)	%						100	101	70-130			
Dibromofluoromethane (S)	%						96	94	70-130			
Toluene-d8 (S)	%						100	100	70-130			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

QC Batch: 329460 Analysis Method: WI MOD DRO
QC Batch Method: WI MOD DRO Analysis Description: WIDRO GCS
Associated Lab Samples: 40192195001, 40192195002, 40192195004, 40192195005, 40192195006, 40192195007

METHOD BLANK: 1911658 Matrix: Water
Associated Lab Samples: 40192195001, 40192195002, 40192195004, 40192195005, 40192195006, 40192195007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Diesel Range Organics	mg/L	<0.015	0.052	08/05/19 11:49	

LABORATORY CONTROL SAMPLE & LCSD: 1911659 1911660

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Diesel Range Organics	mg/L	1	0.79	0.84	79	84	75-115	6	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

DC	Chromatographic pattern inconsistent with typical Diesel Fuel.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

Pace Analytical Services, LLC
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(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TD P3 3RD QTR GW
Pace Project No.: 40192195

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40192195001	MW-402 N	WI MOD DRO	329460	WI MOD DRO	329517
40192195002	MW-11	WI MOD DRO	329460	WI MOD DRO	329517
40192195004	MW-13	WI MOD DRO	329460	WI MOD DRO	329517
40192195005	MW-15	WI MOD DRO	329460	WI MOD DRO	329517
40192195006	MW-19	WI MOD DRO	329460	WI MOD DRO	329517
40192195007	MW-26	WI MOD DRO	329460	WI MOD DRO	329517
40192195001	MW-402 N	EPA 8260	329444		
40192195002	MW-11	EPA 8260	329444		
40192195003	MW-12	EPA 8260	329444		
40192195004	MW-13	EPA 8260	329444		
40192195005	MW-15	EPA 8260	329444		
40192195006	MW-19	EPA 8260	329444		
40192195007	MW-26	EPA 8260	329444		

Pace Analytical™ www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

40192195

Section A Required Client Information:

Company:	Environmental Audits Inc.
Address:	11327 W Lincoln Avenue
	West Allis Wi 53051
Email To:	john@environmentalaudits.net
Phone: 414-226-5563	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	jrruetz@yahoo.com;
Copy To:	eeriii@wi.rr.com; john@environmentalaudits.net
	steph@environmentalaudits.net
Purchase Order No.:	Verbal
Project Name:	TD P3 3rd Qtr GW
Project Number:	

Section C Invoice Information:

Attention:	John Ruetz
Company Name:	Environmental Audits Inc.
Address:	11327 W Lincoln Avenue
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

MSC

Page: of

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: WI

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Analysis Test: VOC	Analysis Test: DRO	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		N				
1	MW - 402 N 001	GW	G	7/30/19					4				x						3	1		
2	MW-11 002	GW	G	7/30/19					4				x						3	1		
3	MW - 12 003	GW	G	7/30/19					4				x						3	X		
4	MW - 13 004	GW	G	7/30/19					4				x						3	1		
5	MW - 15 005	GW	G	7/30/19					4				x						3	1		
6	MW - 19 006	GW	G	7/30/19					4				x						3	1		
7	MW - 26 007	GW	G	7/30/19					4				x						3	1		
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Stephanie Wagner	7/30/19 ~~7/30/19~~	10:41	Mary Jannin	7/31/19	10:40	
	Mary Jannin	7/31/19	1230				
	CS Logistics	8/1/19	0930	[illegible]	8/1/19	0930	Temp in °C: 2.01 / Received on ice (Y/N): Y / Custody Sealed Cooler (Y/N): Y / Samples Intact (Y/N): Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Stephanie Wagner

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 7/30/19

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Sample Preservation Receipt Form

Client Name: Fav Aud 3 Project # 40192195

All containers needing preservation have been checked and noted below: □Yes □No ☑N/A

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

Initial when completed: Date/Time:

Pace Lab #	Glass: AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	Plastic: BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	Vials: DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	WGFU	WPFU	General: SP5T	ZPLC	GN	VOA Vials (>6mm)*	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001	X	-																3															2.5 / 5 / 10
002	X	-																3															2.5 / 5 / 10
003			0.5+1															3															2.5 / 5 / 10
004	X	-	0.5+1															3															2.5 / 5 / 10
005	X	-	0.5+1															3															2.5 / 5 / 10
006	X	-	0.5+1															3															2.5 / 5 / 10
007	X	-																3															2.5 / 5 / 10
008																																	2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																				3													2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																☑																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10

Exceptions to preservation check: (VOA) Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : □Yes ☑No □N/A ***If yes look in headspace column**

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: **WO#: 40192195**

40192195

Client Name: ENV Audits

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other:

Tracking #:

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☑ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Thermometer Used SR - NK **Type of Ice:** (Wet) Blue Dry None ☑ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 6.0 /Corr:

Temp Blank Present: ☐ yes ☑ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 8/1/19
Initials: PG

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☐Yes ☑No ☐N/A	2. pg# 8/1/19
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☐Yes ☑No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☑Yes ☐No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume:		8. 003 no ORD
For Analysis: ☑Yes ☐No MS/MSD:	☐Yes ☑No ☐N/A	8/1/19 PG
Correct Containers Used:	☑Yes ☐No	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☐Yes ☑No ☐N/A	12. Time, I label ~~please~~ Placed on
-Includes date/time/ID/Analysis Matrix: W		bubble bag for 3 vials. 8/1/19 PG
Trip Blank Present:	☐Yes ☑No ☐N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Rma for DM **Date:** 08/01/19

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

October 15, 2019

John Ruetz
Environmental Audits Inc
11327 W Lincoln Ave
West Allis, WI 53227

RE: Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Dear John Ruetz:
Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Ed Raymond, Environmental Audits, Inc
Steve Tiber, Environmental Audits Inc.
Stephanie Wagner, Environmental Audits, Inc.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

CERTIFICATIONS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Green Bay Certification IDs
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

SAMPLE SUMMARY

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40196952001	CR1	Water	10/09/19 12:00	10/10/19 09:15
40196952002	CR2	Water	10/09/19 12:00	10/10/19 09:15
40196952003	CR3	Water	10/09/19 12:00	10/10/19 09:15
40196952004	CR5	Water	10/09/19 12:00	10/10/19 09:15
40196952005	MW-14	Water	10/09/19 12:00	10/10/19 09:15
40196952006	MW-24	Water	10/09/19 12:00	10/10/19 09:15

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Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40196952001	CR1	EPA 8260	LAP	64
40196952002	CR2	EPA 8260	LAP	64
40196952003	CR3	EPA 8260	LAP	64
40196952004	CR5	EPA 8260	LAP	64
40196952005	MW-14	EPA 8260	LAP	64
40196952006	MW-24	EPA 8260	LAP	64

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: CR1 **Lab ID: 40196952001** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.67**	ug/L	2.5	0.67	2.5		10/14/19 12:50	630-20-6	
1,1,1-Trichloroethane	**44.0**	ug/L	2.5	0.61	2.5		10/14/19 12:50	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.69**	ug/L	2.5	0.69	2.5		10/14/19 12:50	79-34-5	
1,1,2-Trichloroethane	**<1.4**	ug/L	12.5	1.4	2.5		10/14/19 12:50	79-00-5	
1,1-Dichloroethane	**370**	ug/L	2.5	0.68	2.5		10/14/19 12:50	75-34-3	
1,1-Dichloroethene	**2.4J**	ug/L	2.5	0.61	2.5		10/14/19 12:50	75-35-4	
1,1-Dichloropropene	**<1.4**	ug/L	4.5	1.4	2.5		10/14/19 12:50	563-58-6	
1,2,3-Trichlorobenzene	**<1.6**	ug/L	12.5	1.6	2.5		10/14/19 12:50	87-61-6	
1,2,3-Trichloropropane	**<1.5**	ug/L	12.5	1.5	2.5		10/14/19 12:50	96-18-4	
1,2,4-Trichlorobenzene	**<2.4**	ug/L	12.5	2.4	2.5		10/14/19 12:50	120-82-1	
1,2,4-Trimethylbenzene	**<2.1**	ug/L	7.0	2.1	2.5		10/14/19 12:50	95-63-6	
1,2-Dibromo-3-chloropropane	**<4.4**	ug/L	14.7	4.4	2.5		10/14/19 12:50	96-12-8	
1,2-Dibromoethane (EDB)	**<2.1**	ug/L	6.9	2.1	2.5		10/14/19 12:50	106-93-4	
1,2-Dichlorobenzene	**<1.8**	ug/L	5.9	1.8	2.5		10/14/19 12:50	95-50-1	
1,2-Dichloroethane	**1.8J**	ug/L	2.5	0.70	2.5		10/14/19 12:50	107-06-2	
1,2-Dichloropropane	**<0.71**	ug/L	2.5	0.71	2.5		10/14/19 12:50	78-87-5	
1,3,5-Trimethylbenzene	**<2.2**	ug/L	7.3	2.2	2.5		10/14/19 12:50	108-67-8	
1,3-Dichlorobenzene	**<1.6**	ug/L	5.2	1.6	2.5		10/14/19 12:50	541-73-1	
1,3-Dichloropropane	**<2.1**	ug/L	6.9	2.1	2.5		10/14/19 12:50	142-28-9	
1,4-Dichlorobenzene	**<2.4**	ug/L	7.9	2.4	2.5		10/14/19 12:50	106-46-7	
2,2-Dichloropropane	**<5.7**	ug/L	18.9	5.7	2.5		10/14/19 12:50	594-20-7	
2-Chlorotoluene	**<2.3**	ug/L	12.5	2.3	2.5		10/14/19 12:50	95-49-8	
4-Chlorotoluene	**<1.9**	ug/L	6.3	1.9	2.5		10/14/19 12:50	106-43-4	
Benzene	**<0.62**	ug/L	2.5	0.62	2.5		10/14/19 12:50	71-43-2	
Bromobenzene	**<0.60**	ug/L	2.5	0.60	2.5		10/14/19 12:50	108-86-1	
Bromochloromethane	**<0.91**	ug/L	12.5	0.91	2.5		10/14/19 12:50	74-97-5	
Bromodichloromethane	**<0.91**	ug/L	3.0	0.91	2.5		10/14/19 12:50	75-27-4	
Bromoform	**<9.9**	ug/L	33.1	9.9	2.5		10/14/19 12:50	75-25-2	
Bromomethane	**<2.4**	ug/L	12.5	2.4	2.5		10/14/19 12:50	74-83-9	
Carbon tetrachloride	**<0.41**	ug/L	2.5	0.41	2.5		10/14/19 12:50	56-23-5	
Chlorobenzene	**<1.8**	ug/L	5.9	1.8	2.5		10/14/19 12:50	108-90-7	
Chloroethane	**4.9J**	ug/L	12.5	3.4	2.5		10/14/19 12:50	75-00-3	
Chloroform	**<3.2**	ug/L	12.5	3.2	2.5		10/14/19 12:50	67-66-3	
Chloromethane	**<5.5**	ug/L	18.2	5.5	2.5		10/14/19 12:50	74-87-3	
Dibromochloromethane	**<6.5**	ug/L	21.7	6.5	2.5		10/14/19 12:50	124-48-1	
Dibromomethane	**<2.3**	ug/L	7.8	2.3	2.5		10/14/19 12:50	74-95-3	
Dichlorodifluoromethane	**<1.2**	ug/L	12.5	1.2	2.5		10/14/19 12:50	75-71-8	
Diisopropyl ether	**<4.7**	ug/L	15.7	4.7	2.5		10/14/19 12:50	108-20-3	
Ethylbenzene	**<0.55**	ug/L	2.5	0.55	2.5		10/14/19 12:50	100-41-4	
Hexachloro-1,3-butadiene	**<3.0**	ug/L	12.5	3.0	2.5		10/14/19 12:50	87-68-3	
Isopropylbenzene (Cumene)	**<0.98**	ug/L	12.5	0.98	2.5		10/14/19 12:50	98-82-8	
Methyl-tert-butyl ether	**<3.1**	ug/L	10.4	3.1	2.5		10/14/19 12:50	1634-04-4	
Methylene Chloride	**<1.5**	ug/L	12.5	1.5	2.5		10/14/19 12:50	75-09-2	
Naphthalene	**<2.9**	ug/L	12.5	2.9	2.5		10/14/19 12:50	91-20-3	
Styrene	**<1.2**	ug/L	3.9	1.2	2.5		10/14/19 12:50	100-42-5	
Tetrachloroethene	**<0.82**	ug/L	2.7	0.82	2.5		10/14/19 12:50	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: CR1 **Lab ID: 40196952001** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.43**	ug/L	12.5	0.43	2.5		10/14/19 12:50	108-88-3	
Trichloroethene	**<0.64**	ug/L	2.5	0.64	2.5		10/14/19 12:50	79-01-6	
Trichlorofluoromethane	**<0.54**	ug/L	2.5	0.54	2.5		10/14/19 12:50	75-69-4	
Vinyl chloride	**7.5**	ug/L	2.5	0.44	2.5		10/14/19 12:50	75-01-4	
cis-1,2-Dichloroethene	**<0.68**	ug/L	2.5	0.68	2.5		10/14/19 12:50	156-59-2	
cis-1,3-Dichloropropene	**<9.1**	ug/L	30.2	9.1	2.5		10/14/19 12:50	10061-01-5	
m&p-Xylene	**<1.2**	ug/L	5.0	1.2	2.5		10/14/19 12:50	179601-23-1	
n-Butylbenzene	**<1.8**	ug/L	5.9	1.8	2.5		10/14/19 12:50	104-51-8	
n-Propylbenzene	**<2.0**	ug/L	12.5	2.0	2.5		10/14/19 12:50	103-65-1	
o-Xylene	**<0.65**	ug/L	2.5	0.65	2.5		10/14/19 12:50	95-47-6	
p-Isopropyltoluene	**<2.0**	ug/L	6.7	2.0	2.5		10/14/19 12:50	99-87-6	
sec-Butylbenzene	**<2.1**	ug/L	12.5	2.1	2.5		10/14/19 12:50	135-98-8	
tert-Butylbenzene	**<0.76**	ug/L	2.5	0.76	2.5		10/14/19 12:50	98-06-6	
trans-1,2-Dichloroethene	**<2.7**	ug/L	9.1	2.7	2.5		10/14/19 12:50	156-60-5	
trans-1,3-Dichloropropene	**<10.9**	ug/L	36.4	10.9	2.5		10/14/19 12:50	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	86	%	70-130		2.5		10/14/19 12:50	460-00-4	
Dibromofluoromethane (S)	102	%	70-130		2.5		10/14/19 12:50	1868-53-7	
Toluene-d8 (S)	98	%	70-130		2.5		10/14/19 12:50	2037-26-5	

Sample: CR2 **Lab ID: 40196952002** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		10/11/19 14:26	630-20-6	
1,1,1-Trichloroethane	**98.3**	ug/L	1.0	0.24	1		10/11/19 14:26	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		10/11/19 14:26	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		10/11/19 14:26	79-00-5	
1,1-Dichloroethane	**32.4**	ug/L	1.0	0.27	1		10/11/19 14:26	75-34-3	
1,1-Dichloroethene	**5.5**	ug/L	1.0	0.24	1		10/11/19 14:26	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		10/11/19 14:26	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		10/11/19 14:26	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		10/11/19 14:26	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		10/11/19 14:26	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		10/11/19 14:26	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		10/11/19 14:26	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		10/11/19 14:26	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/11/19 14:26	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		10/11/19 14:26	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		10/11/19 14:26	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		10/11/19 14:26	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		10/11/19 14:26	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		10/11/19 14:26	142-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: CR2 **Lab ID: 40196952002** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		10/11/19 14:26	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		10/11/19 14:26	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		10/11/19 14:26	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		10/11/19 14:26	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		10/11/19 14:26	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		10/11/19 14:26	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		10/11/19 14:26	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		10/11/19 14:26	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		10/11/19 14:26	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		10/11/19 14:26	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		10/11/19 14:26	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/11/19 14:26	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		10/11/19 14:26	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		10/11/19 14:26	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		10/11/19 14:26	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		10/11/19 14:26	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		10/11/19 14:26	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		10/11/19 14:26	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		10/11/19 14:26	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		10/11/19 14:26	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		10/11/19 14:26	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		10/11/19 14:26	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		10/11/19 14:26	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		10/11/19 14:26	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		10/11/19 14:26	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		10/11/19 14:26	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		10/11/19 14:26	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		10/11/19 14:26	108-88-3	
Trichloroethene	**15.8**	ug/L	1.0	0.26	1		10/11/19 14:26	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		10/11/19 14:26	75-69-4	
Vinyl chloride	**0.72J**	ug/L	1.0	0.17	1		10/11/19 14:26	75-01-4	
cis-1,2-Dichloroethene	**14.2**	ug/L	1.0	0.27	1		10/11/19 14:26	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		10/11/19 14:26	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		10/11/19 14:26	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		10/11/19 14:26	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		10/11/19 14:26	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		10/11/19 14:26	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		10/11/19 14:26	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		10/11/19 14:26	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		10/11/19 14:26	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		10/11/19 14:26	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		10/11/19 14:26	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	87	%	70-130		1		10/11/19 14:26	460-00-4	
Dibromofluoromethane (S)	103	%	70-130		1		10/11/19 14:26	1868-53-7	
Toluene-d8 (S)	101	%	70-130		1		10/11/19 14:26	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: CR3 **Lab ID: 40196952003** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		10/14/19 09:10	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		10/14/19 09:10	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 09:10	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		10/14/19 09:10	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		10/14/19 09:10	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		10/14/19 09:10	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		10/14/19 09:10	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		10/14/19 09:10	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		10/14/19 09:10	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		10/14/19 09:10	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		10/14/19 09:10	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		10/14/19 09:10	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		10/14/19 09:10	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 09:10	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 09:10	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 09:10	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		10/14/19 09:10	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		10/14/19 09:10	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		10/14/19 09:10	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		10/14/19 09:10	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		10/14/19 09:10	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		10/14/19 09:10	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		10/14/19 09:10	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		10/14/19 09:10	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		10/14/19 09:10	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		10/14/19 09:10	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		10/14/19 09:10	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		10/14/19 09:10	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		10/14/19 09:10	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		10/14/19 09:10	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 09:10	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		10/14/19 09:10	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		10/14/19 09:10	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		10/14/19 09:10	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		10/14/19 09:10	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		10/14/19 09:10	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		10/14/19 09:10	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		10/14/19 09:10	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		10/14/19 09:10	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		10/14/19 09:10	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		10/14/19 09:10	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		10/14/19 09:10	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		10/14/19 09:10	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		10/14/19 09:10	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		10/14/19 09:10	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		10/14/19 09:10	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: CR3 **Lab ID: 40196952003** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.17**	ug/L	5.0	0.17	1		10/14/19 09:10	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		10/14/19 09:10	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		10/14/19 09:10	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		10/14/19 09:10	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		10/14/19 09:10	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		10/14/19 09:10	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		10/14/19 09:10	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 09:10	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		10/14/19 09:10	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		10/14/19 09:10	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		10/14/19 09:10	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		10/14/19 09:10	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		10/14/19 09:10	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		10/14/19 09:10	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		10/14/19 09:10	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	70-130		1		10/14/19 09:10	460-00-4	
Dibromofluoromethane (S)	99	%	70-130		1		10/14/19 09:10	1868-53-7	
Toluene-d8 (S)	106	%	70-130		1		10/14/19 09:10	2037-26-5	

Sample: CR5 **Lab ID: 40196952004** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		10/11/19 14:48	630-20-6	
1,1,1-Trichloroethane	**6480**	ug/L	250	61.2	250		10/14/19 14:18	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		10/11/19 14:48	79-34-5	
1,1,2-Trichloroethane	**8.9**	ug/L	5.0	0.55	1		10/11/19 14:48	79-00-5	
1,1-Dichloroethane	**34300**	ug/L	250	68.1	250		10/14/19 14:18	75-34-3	
1,1-Dichloroethene	**1140**	ug/L	250	61.2	250		10/14/19 14:18	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		10/11/19 14:48	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		10/11/19 14:48	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		10/11/19 14:48	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		10/11/19 14:48	120-82-1	
1,2,4-Trimethylbenzene	**3.1**	ug/L	2.8	0.84	1		10/11/19 14:48	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		10/11/19 14:48	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		10/11/19 14:48	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/11/19 14:48	95-50-1	
1,2-Dichloroethane	**125**	ug/L	1.0	0.28	1		10/11/19 14:48	107-06-2	
1,2-Dichloropropane	**0.41J**	ug/L	1.0	0.28	1		10/11/19 14:48	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		10/11/19 14:48	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		10/11/19 14:48	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		10/11/19 14:48	142-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: CR5 **Lab ID: 40196952004** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		10/11/19 14:48	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		10/11/19 14:48	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		10/11/19 14:48	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		10/11/19 14:48	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		10/11/19 14:48	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		10/11/19 14:48	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		10/11/19 14:48	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		10/11/19 14:48	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		10/11/19 14:48	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		10/11/19 14:48	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		10/11/19 14:48	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/11/19 14:48	108-90-7	
Chloroethane	**30500**	ug/L	1250	336	250		10/14/19 14:18	75-00-3	
Chloroform	**5.0**	ug/L	5.0	1.3	1		10/11/19 14:48	67-66-3	
Chloromethane	**9.6**	ug/L	7.3	2.2	1		10/11/19 14:48	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		10/11/19 14:48	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		10/11/19 14:48	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		10/11/19 14:48	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		10/11/19 14:48	108-20-3	
Ethylbenzene	**9.3**	ug/L	1.0	0.22	1		10/11/19 14:48	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		10/11/19 14:48	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		10/11/19 14:48	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		10/11/19 14:48	1634-04-4	
Methylene Chloride	**119**	ug/L	5.0	0.58	1		10/11/19 14:48	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		10/11/19 14:48	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		10/11/19 14:48	100-42-5	
Tetrachloroethene	**19.9**	ug/L	1.1	0.33	1		10/11/19 14:48	127-18-4	
Toluene	**94.5**	ug/L	5.0	0.17	1		10/11/19 14:48	108-88-3	
Trichloroethene	**14.2**	ug/L	1.0	0.26	1		10/11/19 14:48	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		10/11/19 14:48	75-69-4	
Vinyl chloride	**1390**	ug/L	250	43.7	250		10/14/19 14:18	75-01-4	
cis-1,2-Dichloroethene	**75.7**	ug/L	1.0	0.27	1		10/11/19 14:48	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		10/11/19 14:48	10061-01-5	
m&p-Xylene	**29.7**	ug/L	2.0	0.47	1		10/11/19 14:48	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		10/11/19 14:48	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		10/11/19 14:48	103-65-1	
o-Xylene	**10.7**	ug/L	1.0	0.26	1		10/11/19 14:48	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		10/11/19 14:48	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		10/11/19 14:48	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		10/11/19 14:48	98-06-6	
trans-1,2-Dichloroethene	**33.4**	ug/L	3.6	1.1	1		10/11/19 14:48	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		10/11/19 14:48	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	99	%	70-130		1		10/11/19 14:48	460-00-4	
Dibromofluoromethane (S)	117	%	70-130		1		10/11/19 14:48	1868-53-7	
Toluene-d8 (S)	107	%	70-130		1		10/11/19 14:48	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: MW-14 **Lab ID: 40196952005** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		10/14/19 11:22	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		10/14/19 11:22	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 11:22	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		10/14/19 11:22	79-00-5	
1,1-Dichloroethane	**7.1**	ug/L	1.0	0.27	1		10/14/19 11:22	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		10/14/19 11:22	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		10/14/19 11:22	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		10/14/19 11:22	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		10/14/19 11:22	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		10/14/19 11:22	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		10/14/19 11:22	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		10/14/19 11:22	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		10/14/19 11:22	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 11:22	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 11:22	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 11:22	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		10/14/19 11:22	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		10/14/19 11:22	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		10/14/19 11:22	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		10/14/19 11:22	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		10/14/19 11:22	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		10/14/19 11:22	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		10/14/19 11:22	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		10/14/19 11:22	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		10/14/19 11:22	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		10/14/19 11:22	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		10/14/19 11:22	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		10/14/19 11:22	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		10/14/19 11:22	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		10/14/19 11:22	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 11:22	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		10/14/19 11:22	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		10/14/19 11:22	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		10/14/19 11:22	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		10/14/19 11:22	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		10/14/19 11:22	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		10/14/19 11:22	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		10/14/19 11:22	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		10/14/19 11:22	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		10/14/19 11:22	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		10/14/19 11:22	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		10/14/19 11:22	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		10/14/19 11:22	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		10/14/19 11:22	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		10/14/19 11:22	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		10/14/19 11:22	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: MW-14 **Lab ID: 40196952005** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.17**	ug/L	5.0	0.17	1		10/14/19 11:22	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		10/14/19 11:22	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		10/14/19 11:22	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		10/14/19 11:22	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		10/14/19 11:22	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		10/14/19 11:22	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		10/14/19 11:22	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 11:22	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		10/14/19 11:22	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		10/14/19 11:22	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		10/14/19 11:22	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		10/14/19 11:22	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		10/14/19 11:22	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		10/14/19 11:22	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		10/14/19 11:22	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	84	%	70-130		1		10/14/19 11:22	460-00-4	
Dibromofluoromethane (S)	103	%	70-130		1		10/14/19 11:22	1868-53-7	
Toluene-d8 (S)	98	%	70-130		1		10/14/19 11:22	2037-26-5	

Sample: MW-24 **Lab ID: 40196952006** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		10/14/19 08:48	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		10/14/19 08:48	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 08:48	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		10/14/19 08:48	79-00-5	
1,1-Dichloroethane	**0.48J**	ug/L	1.0	0.27	1		10/14/19 08:48	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		10/14/19 08:48	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		10/14/19 08:48	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		10/14/19 08:48	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		10/14/19 08:48	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		10/14/19 08:48	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		10/14/19 08:48	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		10/14/19 08:48	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		10/14/19 08:48	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 08:48	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 08:48	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		10/14/19 08:48	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		10/14/19 08:48	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		10/14/19 08:48	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		10/14/19 08:48	142-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Sample: MW-24 **Lab ID: 40196952006** Collected: 10/09/19 12:00 Received: 10/10/19 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		10/14/19 08:48	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		10/14/19 08:48	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		10/14/19 08:48	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		10/14/19 08:48	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		10/14/19 08:48	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		10/14/19 08:48	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		10/14/19 08:48	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		10/14/19 08:48	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		10/14/19 08:48	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		10/14/19 08:48	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		10/14/19 08:48	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 08:48	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		10/14/19 08:48	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		10/14/19 08:48	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		10/14/19 08:48	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		10/14/19 08:48	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		10/14/19 08:48	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		10/14/19 08:48	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		10/14/19 08:48	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		10/14/19 08:48	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		10/14/19 08:48	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		10/14/19 08:48	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		10/14/19 08:48	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		10/14/19 08:48	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		10/14/19 08:48	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		10/14/19 08:48	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		10/14/19 08:48	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		10/14/19 08:48	108-88-3	
Trichloroethene	**0.64J**	ug/L	1.0	0.26	1		10/14/19 08:48	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		10/14/19 08:48	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		10/14/19 08:48	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		10/14/19 08:48	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		10/14/19 08:48	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		10/14/19 08:48	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		10/14/19 08:48	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		10/14/19 08:48	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		10/14/19 08:48	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		10/14/19 08:48	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		10/14/19 08:48	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		10/14/19 08:48	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		10/14/19 08:48	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		10/14/19 08:48	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	87	%	70-130		1		10/14/19 08:48	460-00-4	
Dibromofluoromethane (S)	102	%	70-130		1		10/14/19 08:48	1868-53-7	
Toluene-d8 (S)	97	%	70-130		1		10/14/19 08:48	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

QC Batch: 337078 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 40196952001, 40196952002, 40196952003, 40196952004, 40196952005, 40196952006

METHOD BLANK: 1957829 Matrix: Water
Associated Lab Samples: 40196952001, 40196952002, 40196952003, 40196952004, 40196952005, 40196952006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.27	1.0	10/11/19 09:38	
1,1,1-Trichloroethane	ug/L	<0.24	1.0	10/11/19 09:38	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	1.0	10/11/19 09:38	
1,1,2-Trichloroethane	ug/L	<0.55	5.0	10/11/19 09:38	
1,1-Dichloroethane	ug/L	<0.27	1.0	10/11/19 09:38	
1,1-Dichloroethene	ug/L	<0.24	1.0	10/11/19 09:38	
1,1-Dichloropropene	ug/L	<0.54	1.8	10/11/19 09:38	
1,2,3-Trichlorobenzene	ug/L	<0.63	5.0	10/11/19 09:38	
1,2,3-Trichloropropane	ug/L	<0.59	5.0	10/11/19 09:38	
1,2,4-Trichlorobenzene	ug/L	<0.95	5.0	10/11/19 09:38	
1,2,4-Trimethylbenzene	ug/L	<0.84	2.8	10/11/19 09:38	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	5.9	10/11/19 09:38	
1,2-Dibromoethane (EDB)	ug/L	<0.83	2.8	10/11/19 09:38	
1,2-Dichlorobenzene	ug/L	<0.71	2.4	10/11/19 09:38	
1,2-Dichloroethane	ug/L	<0.28	1.0	10/11/19 09:38	
1,2-Dichloropropane	ug/L	<0.28	1.0	10/11/19 09:38	
1,3,5-Trimethylbenzene	ug/L	<0.87	2.9	10/11/19 09:38	
1,3-Dichlorobenzene	ug/L	<0.63	2.1	10/11/19 09:38	
1,3-Dichloropropane	ug/L	<0.83	2.8	10/11/19 09:38	
1,4-Dichlorobenzene	ug/L	<0.94	3.1	10/11/19 09:38	
2,2-Dichloropropane	ug/L	<2.3	7.6	10/11/19 09:38	
2-Chlorotoluene	ug/L	<0.93	5.0	10/11/19 09:38	
4-Chlorotoluene	ug/L	<0.76	2.5	10/11/19 09:38	
Benzene	ug/L	<0.25	1.0	10/11/19 09:38	
Bromobenzene	ug/L	<0.24	1.0	10/11/19 09:38	
Bromochloromethane	ug/L	<0.36	5.0	10/11/19 09:38	
Bromodichloromethane	ug/L	<0.36	1.2	10/11/19 09:38	
Bromoform	ug/L	<4.0	13.2	10/11/19 09:38	
Bromomethane	ug/L	<0.97	5.0	10/11/19 09:38	
Carbon tetrachloride	ug/L	<0.17	1.0	10/11/19 09:38	
Chlorobenzene	ug/L	<0.71	2.4	10/11/19 09:38	
Chloroethane	ug/L	<1.3	5.0	10/11/19 09:38	
Chloroform	ug/L	<1.3	5.0	10/11/19 09:38	
Chloromethane	ug/L	<2.2	7.3	10/11/19 09:38	
cis-1,2-Dichloroethene	ug/L	<0.27	1.0	10/11/19 09:38	
cis-1,3-Dichloropropene	ug/L	<3.6	12.1	10/11/19 09:38	
Dibromochloromethane	ug/L	<2.6	8.7	10/11/19 09:38	
Dibromomethane	ug/L	<0.94	3.1	10/11/19 09:38	
Dichlorodifluoromethane	ug/L	<0.50	5.0	10/11/19 09:38	
Diisopropyl ether	ug/L	<1.9	6.3	10/11/19 09:38	
Ethylbenzene	ug/L	<0.22	1.0	10/11/19 09:38	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

METHOD BLANK: 1957829 Matrix: Water
Associated Lab Samples: 40196952001, 40196952002, 40196952003, 40196952004, 40196952005, 40196952006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Hexachloro-1,3-butadiene	ug/L	<1.2	5.0	10/11/19 09:38	
Isopropylbenzene (Cumene)	ug/L	<0.39	5.0	10/11/19 09:38	
m&p-Xylene	ug/L	<0.47	2.0	10/11/19 09:38	
Methyl-tert-butyl ether	ug/L	<1.2	4.2	10/11/19 09:38	
Methylene Chloride	ug/L	<0.58	5.0	10/11/19 09:38	
n-Butylbenzene	ug/L	<0.71	2.4	10/11/19 09:38	
n-Propylbenzene	ug/L	<0.81	5.0	10/11/19 09:38	
Naphthalene	ug/L	<1.2	5.0	10/11/19 09:38	
o-Xylene	ug/L	<0.26	1.0	10/11/19 09:38	
p-Isopropyltoluene	ug/L	<0.80	2.7	10/11/19 09:38	
sec-Butylbenzene	ug/L	<0.85	5.0	10/11/19 09:38	
Styrene	ug/L	<0.47	1.6	10/11/19 09:38	
tert-Butylbenzene	ug/L	<0.30	1.0	10/11/19 09:38	
Tetrachloroethene	ug/L	<0.33	1.1	10/11/19 09:38	
Toluene	ug/L	<0.17	5.0	10/11/19 09:38	
trans-1,2-Dichloroethene	ug/L	<1.1	3.6	10/11/19 09:38	
trans-1,3-Dichloropropene	ug/L	<4.4	14.6	10/11/19 09:38	
Trichloroethene	ug/L	<0.26	1.0	10/11/19 09:38	
Trichlorofluoromethane	ug/L	<0.21	1.0	10/11/19 09:38	
Vinyl chloride	ug/L	<0.17	1.0	10/11/19 09:38	
4-Bromofluorobenzene (S)	%	89	70-130	10/11/19 09:38	
Dibromofluoromethane (S)	%	98	70-130	10/11/19 09:38	
Toluene-d8 (S)	%	99	70-130	10/11/19 09:38	

LABORATORY CONTROL SAMPLE: 1957830

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	59.9	120	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	52.4	105	70-130	
1,1,2-Trichloroethane	ug/L	50	54.2	108	70-130	
1,1-Dichloroethane	ug/L	50	59.3	119	73-150	
1,1-Dichloroethene	ug/L	50	57.2	114	73-138	
1,2,4-Trichlorobenzene	ug/L	50	48.0	96	70-130	
1,2-Dibromo-3-chloropropane	ug/L	50	51.8	104	64-129	
1,2-Dibromoethane (EDB)	ug/L	50	52.8	106	70-130	
1,2-Dichlorobenzene	ug/L	50	52.5	105	70-130	
1,2-Dichloroethane	ug/L	50	53.5	107	75-140	
1,2-Dichloropropane	ug/L	50	53.5	107	73-135	
1,3-Dichlorobenzene	ug/L	50	52.4	105	70-130	
1,4-Dichlorobenzene	ug/L	50	51.5	103	70-130	
Benzene	ug/L	50	55.0	110	70-130	
Bromodichloromethane	ug/L	50	55.9	112	70-130	
Bromoform	ug/L	50	56.9	114	68-129	
Bromomethane	ug/L	50	33.6	67	18-159	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

LABORATORY CONTROL SAMPLE: 1957830

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Carbon tetrachloride	ug/L	50	57.6	115	70-130	
Chlorobenzene	ug/L	50	55.4	111	70-130	
Chloroethane	ug/L	50	43.2	86	53-147	
Chloroform	ug/L	50	55.6	111	74-136	
Chloromethane	ug/L	50	29.7	59	29-115	
cis-1,2-Dichloroethene	ug/L	50	54.7	109	70-130	
cis-1,3-Dichloropropene	ug/L	50	57.7	115	70-130	
Dibromochloromethane	ug/L	50	55.2	110	70-130	
Dichlorodifluoromethane	ug/L	50	25.6	51	10-130	
Ethylbenzene	ug/L	50	57.3	115	80-124	
Isopropylbenzene (Cumene)	ug/L	50	60.5	121	70-130	
m&p-Xylene	ug/L	100	118	118	70-130	
Methyl-tert-butyl ether	ug/L	50	51.8	104	54-137	
Methylene Chloride	ug/L	50	50.0	100	73-138	
o-Xylene	ug/L	50	59.1	118	70-130	
Styrene	ug/L	50	54.9	110	70-130	
Tetrachloroethene	ug/L	50	55.9	112	70-130	
Toluene	ug/L	50	55.2	110	80-126	
trans-1,2-Dichloroethene	ug/L	50	57.5	115	73-145	
trans-1,3-Dichloropropene	ug/L	50	55.7	111	70-130	
Trichloroethene	ug/L	50	57.8	116	70-130	
Trichlorofluoromethane	ug/L	50	49.4	99	76-147	
Vinyl chloride	ug/L	50	38.8	78	51-120	
4-Bromofluorobenzene (S)	%			102	70-130	
Dibromofluoromethane (S)	%			100	70-130	
Toluene-d8 (S)	%			99	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1957831 1957832

Parameter	Units	40196954008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	2.7	50	50	63.7	61.0	122	117	70-130	4	20	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	50	50	55.1	53.0	110	106	70-130	4	20	
1,1,2-Trichloroethane	ug/L	<0.55	50	50	53.6	55.4	107	111	70-137	3	20	
1,1-Dichloroethane	ug/L	2.6	50	50	62.9	62.0	121	119	73-153	1	20	
1,1-Dichloroethene	ug/L	0.40J	50	50	58.0	56.7	115	113	73-138	2	20	
1,2,4-Trichlorobenzene	ug/L	<0.95	50	50	49.5	49.9	99	100	70-130	1	20	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	50	50	57.0	55.5	114	111	58-129	3	20	
1,2-Dibromoethane (EDB)	ug/L	<0.83	50	50	52.6	54.9	105	110	70-130	4	20	
1,2-Dichlorobenzene	ug/L	<0.71	50	50	54.3	53.0	109	106	70-130	2	20	
1,2-Dichloroethane	ug/L	<0.28	50	50	57.8	56.3	116	113	75-140	3	20	
1,2-Dichloropropane	ug/L	<0.28	50	50	55.1	54.5	110	109	71-138	1	20	
1,3-Dichlorobenzene	ug/L	<0.63	50	50	53.8	52.4	108	105	70-130	3	20	
1,4-Dichlorobenzene	ug/L	<0.94	50	50	54.1	52.9	108	106	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1957831 1957832

Parameter	Units	40196954008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Benzene	ug/L	<0.25	50	50	56.8	55.5	114	111	70-130	2	20	
Bromodichloromethane	ug/L	<0.36	50	50	55.0	55.1	110	110	70-130	0	20	
Bromoform	ug/L	<4.0	50	50	55.6	57.2	111	114	68-129	3	20	
Bromomethane	ug/L	<0.97	50	50	34.7	34.1	69	68	15-170	2	20	
Carbon tetrachloride	ug/L	<0.17	50	50	58.8	55.7	118	111	70-130	5	20	
Chlorobenzene	ug/L	<0.71	50	50	55.2	55.7	110	111	70-130	1	20	
Chloroethane	ug/L	<1.3	50	50	44.0	44.6	88	89	51-148	1	20	
Chloroform	ug/L	<1.3	50	50	55.7	55.3	111	111	74-136	1	20	
Chloromethane	ug/L	4.6J	50	50	35.4	35.6	61	62	23-115	1	20	
cis-1,2-Dichloroethene	ug/L	0.59J	50	50	57.0	55.2	113	109	70-131	3	20	
cis-1,3-Dichloropropene	ug/L	<3.6	50	50	57.6	57.0	115	114	70-130	1	20	
Dibromochloromethane	ug/L	<2.6	50	50	53.7	56.7	107	113	70-130	5	20	
Dichlorodifluoromethane	ug/L	<0.50	50	50	25.6	23.9	51	48	10-132	7	20	
Ethylbenzene	ug/L	<0.22	50	50	56.0	58.1	112	116	80-125	4	20	
Isopropylbenzene (Cumene)	ug/L	<0.39	50	50	60.0	59.6	120	119	70-130	1	20	
m&p-Xylene	ug/L	<0.47	100	100	117	118	117	118	70-130	0	20	
Methyl-tert-butyl ether	ug/L	<1.2	50	50	53.0	52.2	106	104	51-145	2	20	
Methylene Chloride	ug/L	<0.58	50	50	51.9	51.2	103	102	73-140	1	20	
o-Xylene	ug/L	<0.26	50	50	58.1	60.5	116	121	70-130	4	20	
Styrene	ug/L	<0.47	50	50	53.6	51.9	107	104	70-130	3	20	
Tetrachloroethene	ug/L	<0.33	50	50	53.2	55.9	106	112	70-130	5	20	
Toluene	ug/L	<0.17	50	50	54.1	56.1	108	112	80-131	4	20	
trans-1,2-Dichloroethene	ug/L	<1.1	50	50	58.2	56.4	116	112	73-148	3	20	
trans-1,3-Dichloropropene	ug/L	<4.4	50	50	54.9	56.9	110	114	70-130	4	20	
Trichloroethene	ug/L	1.2	50	50	57.5	56.9	112	111	70-130	1	20	
Trichlorofluoromethane	ug/L	<0.21	50	50	48.7	47.2	97	94	74-147	3	20	
Vinyl chloride	ug/L	<0.17	50	50	40.5	39.2	81	78	41-129	3	20	
4-Bromofluorobenzene (S)	%						100	104	70-130			
Dibromofluoromethane (S)	%						101	99	70-130			
Toluene-d8 (S)	%						96	101	70-130			

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TD P3 4TH QTR GW
Pace Project No.: 40196952

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40196952001	CR1	EPA 8260	337078		
40196952002	CR2	EPA 8260	337078		
40196952003	CR3	EPA 8260	337078		
40196952004	CR5	EPA 8260	337078		
40196952005	MW-14	EPA 8260	337078		
40196952006	MW-24	EPA 8260	337078		

Pace Analytical™
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

JHB

40196952

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Environmental Audits Inc.	Report To:	jrruetz@yahoo.com;	Attention:	John Ruetz
Address:	11327 W Lincoln Avenue	Copy To:	eeriii@wi.rr.com; john@environmentalaudits.net	Company Name:	Environmental Audits Inc.
	West Allis Wi 53051		steph@environmentalaudits.net	Address:	11327 W Lincoln Avenue
Email To:	john@environmentalaudits.net	Purchase Order No.:	Verbal	Pace Quote Reference:	
Phone:	414-226-5563 Fax:	Project Name:	TD P3 4th Qtr GW	Pace Project Manager:	
Requested Due Date/TAT:		Project Number:		Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER

Site Location STATE: WI

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE		MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Analysis Test: VOC										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	MATRIX CODES: DRINKING WATER DW WT; WATER WW P; WASTE WATER SL; PRODUCT OL WP; SOIL/SOLID AR; OIL OT; WIPE TS; AIR; OTHER; TISSUE																			N											
1	CR1	001	GW	G			10/8/19	PM		3				x							3											
2	CR2	002	GW	G			10/8/19	PM		3				x							3											
3	CR3	003	GW	G			10/8/19	PM		3				x							3											
4	CR5	004	GW	G			10/8/19	PM		3				x							3											
5	MW – 14	005	GW	G			10/8/19	PM		3				x							3											
6	MW – 24	006	GW	G			10/8/19	PM		3				x							3											
7																																
8																																
9																																
10																																
11																																
12										1640																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Steve Tiber	10/9/19	16:15	Mary Jannin	10/9/19	16:15				
	Mary Jannin	10/9/19	~~15~~ 1640							
	CS Logistics	10/10/19	9:15	Alan Pace	10/10/19	9:15	4.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Steve Tiber		
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY):	10/8/19

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Sample Preservation Receipt Form

Client Name: Environmental Audits Project # 60196952

All containers needing preservation have been checked and noted below: □Yes □No ☒N/A Initial when completed: Date/ Time:

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass							Plastic							Vials						Jars			General			VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
	AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	JGFU	WGFU	WPFU	SP5T	ZPLC	GN							
001																			3														2.5 / 5 / 10
002																			3														2.5 / 5 / 10
003																			3														2.5 / 5 / 10
004																			3														2.5 / 5 / 10
005																			3														2.5 / 5 / 10
006																			2														2.5 / 5 / 10
007																																	2.5 / 5 / 10
008																																	2.5 / 5 / 10
009																																	2.5 / 5 / 10
010																																	2.5 / 5 / 10
011																																	2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																																	2.5 / 5 / 10
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019																																	2.5 / 5 / 10
020																																	2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: Headspace in VOA Vials (>6mm): □Yes ☒No □N/A *If yes look in headspace column

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: **WO# : 40196952**

40196952

Client Name: Environmental Audits

Courier: ☑ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco
☐ Client ☐ Pace Other: _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other _____

Thermometer Used SR - 24 **Type of Ice:** Wet Blue Dry None ☐ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: 4.5 /Corr: 4.5

Temp Blank Present: ☐ yes ☑ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 10/10/19
Initials: AS

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☑Yes ☐No ☐N/A		8.
Correct Containers Used:	☑Yes ☐No	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☑N/A	
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix:	☐Yes ☑No ☐N/A	12. No labels on sample, matched by packaging label 10/10/19 AS
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: ACrom **Date:** 10/10/19

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Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

November 25, 2019

John Ruetz
Environmental Audits Inc
11327 W Lincoln Ave
West Allis, WI 53227

RE: Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Dear John Ruetz:
Enclosed are the analytical results for sample(s) received by the laboratory on November 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dan Milewsky
dan.milewsky@pacelabs.com
(920)469-2436
Project Manager

Enclosures

cc: Ed Raymond, Environmental Audits, Inc
Steve Tiber, Environmental Audits Inc.
Stephanie Wagner, Environmental Audits, Inc.

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CERTIFICATIONS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Pace Analytical Services Green Bay
1241 Bellevue Street, Green Bay, WI 54302
Florida/NELAP Certification #: E87948
Illinois Certification #: 200050
Kentucky UST Certification #: 82
Louisiana Certification #: 04168
Minnesota Certification #: 055-999-334
New York Certification #: 12064
North Dakota Certification #: R-150
Virginia VELAP ID: 460263
South Carolina Certification #: 83006001
Texas Certification #: T104704529-14-1
Wisconsin Certification #: 405132750
Wisconsin DATCP Certification #: 105-444
USDA Soil Permit #: P330-16-00157
Federal Fish & Wildlife Permit #: LE51774A-0

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40199588001	**MW-1**	Water	11/19/19 00:00	11/21/19 08:45
40199588002	**MW-2**	Water	11/19/19 00:00	11/21/19 08:45
40199588003	**MW-6**	Water	11/19/19 00:00	11/21/19 08:45
40199588004	**MW-7**	Water	11/19/19 00:00	11/21/19 08:45
40199588005	**MW-9**	Water	11/19/19 00:00	11/21/19 08:45
40199588006	**MW-10**	Water	11/19/19 00:00	11/21/19 08:45
40199588007	**MW-17**	Water	11/19/19 00:00	11/21/19 08:45
40199588008	**MW-22**	Water	11/19/19 00:00	11/21/19 08:45
40199588009	**MW-23**	Water	11/19/19 00:00	11/21/19 08:45
40199588010	**MW-25**	Water	11/19/19 00:00	11/21/19 08:45
40199588011	**TRIP BLANK**	Water	11/19/19 00:00	11/21/19 08:45

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SAMPLE ANALYTE COUNT

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40199588001	MW-1	EPA 8260	HNW	64
40199588002	MW-2	EPA 8260	HNW	64
40199588003	MW-6	EPA 8260	HNW	64
40199588004	MW-7	EPA 8260	HNW	64
40199588005	MW-9	EPA 8260	HNW	64
40199588006	MW-10	EPA 8260	HNW	64
40199588007	MW-17	EPA 8260	HNW	64
40199588008	MW-22	EPA 8260	HNW	64
40199588009	MW-23	EPA 8260	HNW	64
40199588010	MW-25	EPA 8260	HNW	64
40199588011	TRIP BLANK	EPA 8260	HNW	64

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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-1 **Lab ID: 40199588001** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 10:42	630-20-6	
1,1,1-Trichloroethane	**1.4**	ug/L	1.0	0.24	1		11/22/19 10:42	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 10:42	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 10:42	79-00-5	
1,1-Dichloroethane	**53.9**	ug/L	1.0	0.27	1		11/22/19 10:42	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 10:42	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 10:42	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 10:42	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 10:42	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 10:42	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 10:42	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 10:42	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 10:42	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 10:42	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 10:42	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 10:42	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 10:42	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 10:42	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 10:42	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 10:42	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 10:42	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 10:42	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 10:42	106-43-4	
Benzene	**0.29J**	ug/L	1.0	0.25	1		11/22/19 10:42	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 10:42	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 10:42	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 10:42	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 10:42	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 10:42	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 10:42	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 10:42	108-90-7	
Chloroethane	**17.1**	ug/L	5.0	1.3	1		11/22/19 10:42	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 10:42	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 10:42	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 10:42	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 10:42	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 10:42	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 10:42	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 10:42	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 10:42	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 10:42	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 10:42	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 10:42	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 10:42	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 10:42	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 10:42	127-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-1 **Lab ID: 40199588001** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**0.38J**	ug/L	5.0	0.17	1		11/22/19 10:42	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 10:42	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 10:42	75-69-4	
Vinyl chloride	**3.9**	ug/L	1.0	0.17	1		11/22/19 10:42	75-01-4	
cis-1,2-Dichloroethene	**0.65J**	ug/L	1.0	0.27	1		11/22/19 10:42	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 10:42	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 10:42	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 10:42	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 10:42	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 10:42	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 10:42	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 10:42	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 10:42	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 10:42	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 10:42	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	92	%	70-130		1		11/22/19 10:42	460-00-4	
Dibromofluoromethane (S)	100	%	70-130		1		11/22/19 10:42	1868-53-7	
Toluene-d8 (S)	101	%	70-130		1		11/22/19 10:42	2037-26-5	

Sample: MW-2 **Lab ID: 40199588002** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<1.3**	ug/L	5.0	1.3	5		11/22/19 09:13	630-20-6	
1,1,1-Trichloroethane	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:13	71-55-6	
1,1,2,2-Tetrachloroethane	**<1.4**	ug/L	5.0	1.4	5		11/22/19 09:13	79-34-5	
1,1,2-Trichloroethane	**<2.8**	ug/L	25.0	2.8	5		11/22/19 09:13	79-00-5	
1,1-Dichloroethane	**15.4**	ug/L	5.0	1.4	5		11/22/19 09:13	75-34-3	
1,1-Dichloroethene	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:13	75-35-4	
1,1-Dichloropropene	**<2.7**	ug/L	9.0	2.7	5		11/22/19 09:13	563-58-6	
1,2,3-Trichlorobenzene	**<3.1**	ug/L	25.0	3.1	5		11/22/19 09:13	87-61-6	
1,2,3-Trichloropropane	**<3.0**	ug/L	25.0	3.0	5		11/22/19 09:13	96-18-4	
1,2,4-Trichlorobenzene	**<4.8**	ug/L	25.0	4.8	5		11/22/19 09:13	120-82-1	
1,2,4-Trimethylbenzene	**<4.2**	ug/L	14.0	4.2	5		11/22/19 09:13	95-63-6	
1,2-Dibromo-3-chloropropane	**<8.8**	ug/L	29.4	8.8	5		11/22/19 09:13	96-12-8	
1,2-Dibromoethane (EDB)	**<4.1**	ug/L	13.8	4.1	5		11/22/19 09:13	106-93-4	
1,2-Dichlorobenzene	**<3.5**	ug/L	11.8	3.5	5		11/22/19 09:13	95-50-1	
1,2-Dichloroethane	**<1.4**	ug/L	5.0	1.4	5		11/22/19 09:13	107-06-2	
1,2-Dichloropropane	**<1.4**	ug/L	5.0	1.4	5		11/22/19 09:13	78-87-5	
1,3,5-Trimethylbenzene	**<4.4**	ug/L	14.6	4.4	5		11/22/19 09:13	108-67-8	
1,3-Dichlorobenzene	**<3.1**	ug/L	10.5	3.1	5		11/22/19 09:13	541-73-1	
1,3-Dichloropropane	**<4.1**	ug/L	13.8	4.1	5		11/22/19 09:13	142-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-2 **Lab ID: 40199588002** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<4.7**	ug/L	15.7	4.7	5		11/22/19 09:13	106-46-7	
2,2-Dichloropropane	**<11.3**	ug/L	37.8	11.3	5		11/22/19 09:13	594-20-7	
2-Chlorotoluene	**<4.6**	ug/L	25.0	4.6	5		11/22/19 09:13	95-49-8	
4-Chlorotoluene	**<3.8**	ug/L	12.6	3.8	5		11/22/19 09:13	106-43-4	
Benzene	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:13	71-43-2	
Bromobenzene	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:13	108-86-1	
Bromochloromethane	**<1.8**	ug/L	25.0	1.8	5		11/22/19 09:13	74-97-5	
Bromodichloromethane	**<1.8**	ug/L	6.1	1.8	5		11/22/19 09:13	75-27-4	
Bromoform	**<19.9**	ug/L	66.2	19.9	5		11/22/19 09:13	75-25-2	
Bromomethane	**<4.9**	ug/L	25.0	4.9	5		11/22/19 09:13	74-83-9	
Carbon tetrachloride	**<0.83**	ug/L	5.0	0.83	5		11/22/19 09:13	56-23-5	
Chlorobenzene	**<3.6**	ug/L	11.8	3.6	5		11/22/19 09:13	108-90-7	
Chloroethane	**7.0J**	ug/L	25.0	6.7	5		11/22/19 09:13	75-00-3	
Chloroform	**<6.4**	ug/L	25.0	6.4	5		11/22/19 09:13	67-66-3	
Chloromethane	**<10.9**	ug/L	36.5	10.9	5		11/22/19 09:13	74-87-3	
Dibromochloromethane	**<13.0**	ug/L	43.4	13.0	5		11/22/19 09:13	124-48-1	
Dibromomethane	**<4.7**	ug/L	15.6	4.7	5		11/22/19 09:13	74-95-3	
Dichlorodifluoromethane	**<2.5**	ug/L	25.0	2.5	5		11/22/19 09:13	75-71-8	
Diisopropyl ether	**<9.4**	ug/L	31.5	9.4	5		11/22/19 09:13	108-20-3	
Ethylbenzene	**<1.1**	ug/L	5.0	1.1	5		11/22/19 09:13	100-41-4	
Hexachloro-1,3-butadiene	**<5.9**	ug/L	25.0	5.9	5		11/22/19 09:13	87-68-3	
Isopropylbenzene (Cumene)	**<2.0**	ug/L	25.0	2.0	5		11/22/19 09:13	98-82-8	
Methyl-tert-butyl ether	**<6.2**	ug/L	20.8	6.2	5		11/22/19 09:13	1634-04-4	
Methylene Chloride	**<2.9**	ug/L	25.0	2.9	5		11/22/19 09:13	75-09-2	
Naphthalene	**<5.9**	ug/L	25.0	5.9	5		11/22/19 09:13	91-20-3	
Styrene	**<2.3**	ug/L	7.8	2.3	5		11/22/19 09:13	100-42-5	
Tetrachloroethene	**<1.6**	ug/L	5.4	1.6	5		11/22/19 09:13	127-18-4	
Toluene	**<0.86**	ug/L	25.0	0.86	5		11/22/19 09:13	108-88-3	
Trichloroethene	**<1.3**	ug/L	5.0	1.3	5		11/22/19 09:13	79-01-6	
Trichlorofluoromethane	**<1.1**	ug/L	5.0	1.1	5		11/22/19 09:13	75-69-4	
Vinyl chloride	**<0.87**	ug/L	5.0	0.87	5		11/22/19 09:13	75-01-4	
cis-1,2-Dichloroethene	**<1.4**	ug/L	5.0	1.4	5		11/22/19 09:13	156-59-2	
cis-1,3-Dichloropropene	**<18.1**	ug/L	60.5	18.1	5		11/22/19 09:13	10061-01-5	
m&p-Xylene	**<2.3**	ug/L	10.0	2.3	5		11/22/19 09:13	179601-23-1	
n-Butylbenzene	**<3.5**	ug/L	11.8	3.5	5		11/22/19 09:13	104-51-8	
n-Propylbenzene	**<4.1**	ug/L	25.0	4.1	5		11/22/19 09:13	103-65-1	
o-Xylene	**<1.3**	ug/L	5.0	1.3	5		11/22/19 09:13	95-47-6	
p-Isopropyltoluene	**<4.0**	ug/L	13.3	4.0	5		11/22/19 09:13	99-87-6	
sec-Butylbenzene	**<4.2**	ug/L	25.0	4.2	5		11/22/19 09:13	135-98-8	
tert-Butylbenzene	**<1.5**	ug/L	5.1	1.5	5		11/22/19 09:13	98-06-6	
trans-1,2-Dichloroethene	**<5.5**	ug/L	18.2	5.5	5		11/22/19 09:13	156-60-5	
trans-1,3-Dichloropropene	**<21.9**	ug/L	72.8	21.9	5		11/22/19 09:13	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	95	%	70-130		5		11/22/19 09:13	460-00-4	D3
Dibromofluoromethane (S)	101	%	70-130		5		11/22/19 09:13	1868-53-7	
Toluene-d8 (S)	101	%	70-130		5		11/22/19 09:13	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-6 **Lab ID: 40199588003** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<1.3**	ug/L	5.0	1.3	5		11/22/19 09:36	630-20-6	
1,1,1-Trichloroethane	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:36	71-55-6	
1,1,2,2-Tetrachloroethane	**<1.4**	ug/L	5.0	1.4	5		11/22/19 09:36	79-34-5	
1,1,2-Trichloroethane	**<2.8**	ug/L	25.0	2.8	5		11/22/19 09:36	79-00-5	
1,1-Dichloroethane	**118**	ug/L	5.0	1.4	5		11/22/19 09:36	75-34-3	
1,1-Dichloroethene	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:36	75-35-4	
1,1-Dichloropropene	**<2.7**	ug/L	9.0	2.7	5		11/22/19 09:36	563-58-6	
1,2,3-Trichlorobenzene	**<3.1**	ug/L	25.0	3.1	5		11/22/19 09:36	87-61-6	
1,2,3-Trichloropropane	**<3.0**	ug/L	25.0	3.0	5		11/22/19 09:36	96-18-4	
1,2,4-Trichlorobenzene	**<4.8**	ug/L	25.0	4.8	5		11/22/19 09:36	120-82-1	
1,2,4-Trimethylbenzene	**<4.2**	ug/L	14.0	4.2	5		11/22/19 09:36	95-63-6	
1,2-Dibromo-3-chloropropane	**<8.8**	ug/L	29.4	8.8	5		11/22/19 09:36	96-12-8	
1,2-Dibromoethane (EDB)	**<4.1**	ug/L	13.8	4.1	5		11/22/19 09:36	106-93-4	
1,2-Dichlorobenzene	**<3.5**	ug/L	11.8	3.5	5		11/22/19 09:36	95-50-1	
1,2-Dichloroethane	**<1.4**	ug/L	5.0	1.4	5		11/22/19 09:36	107-06-2	
1,2-Dichloropropane	**<1.4**	ug/L	5.0	1.4	5		11/22/19 09:36	78-87-5	
1,3,5-Trimethylbenzene	**<4.4**	ug/L	14.6	4.4	5		11/22/19 09:36	108-67-8	
1,3-Dichlorobenzene	**<3.1**	ug/L	10.5	3.1	5		11/22/19 09:36	541-73-1	
1,3-Dichloropropane	**<4.1**	ug/L	13.8	4.1	5		11/22/19 09:36	142-28-9	
1,4-Dichlorobenzene	**<4.7**	ug/L	15.7	4.7	5		11/22/19 09:36	106-46-7	
2,2-Dichloropropane	**<11.3**	ug/L	37.8	11.3	5		11/22/19 09:36	594-20-7	
2-Chlorotoluene	**<4.6**	ug/L	25.0	4.6	5		11/22/19 09:36	95-49-8	
4-Chlorotoluene	**<3.8**	ug/L	12.6	3.8	5		11/22/19 09:36	106-43-4	
Benzene	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:36	71-43-2	
Bromobenzene	**<1.2**	ug/L	5.0	1.2	5		11/22/19 09:36	108-86-1	
Bromochloromethane	**<1.8**	ug/L	25.0	1.8	5		11/22/19 09:36	74-97-5	
Bromodichloromethane	**<1.8**	ug/L	6.1	1.8	5		11/22/19 09:36	75-27-4	
Bromoform	**<19.9**	ug/L	66.2	19.9	5		11/22/19 09:36	75-25-2	
Bromomethane	**<4.9**	ug/L	25.0	4.9	5		11/22/19 09:36	74-83-9	
Carbon tetrachloride	**<0.83**	ug/L	5.0	0.83	5		11/22/19 09:36	56-23-5	
Chlorobenzene	**<3.6**	ug/L	11.8	3.6	5		11/22/19 09:36	108-90-7	
Chloroethane	**7.8J**	ug/L	25.0	6.7	5		11/22/19 09:36	75-00-3	
Chloroform	**<6.4**	ug/L	25.0	6.4	5		11/22/19 09:36	67-66-3	
Chloromethane	**<10.9**	ug/L	36.5	10.9	5		11/22/19 09:36	74-87-3	
Dibromochloromethane	**<13.0**	ug/L	43.4	13.0	5		11/22/19 09:36	124-48-1	
Dibromomethane	**<4.7**	ug/L	15.6	4.7	5		11/22/19 09:36	74-95-3	
Dichlorodifluoromethane	**<2.5**	ug/L	25.0	2.5	5		11/22/19 09:36	75-71-8	
Diisopropyl ether	**<9.4**	ug/L	31.5	9.4	5		11/22/19 09:36	108-20-3	
Ethylbenzene	**<1.1**	ug/L	5.0	1.1	5		11/22/19 09:36	100-41-4	
Hexachloro-1,3-butadiene	**<5.9**	ug/L	25.0	5.9	5		11/22/19 09:36	87-68-3	
Isopropylbenzene (Cumene)	**<2.0**	ug/L	25.0	2.0	5		11/22/19 09:36	98-82-8	
Methyl-tert-butyl ether	**<6.2**	ug/L	20.8	6.2	5		11/22/19 09:36	1634-04-4	
Methylene Chloride	**<2.9**	ug/L	25.0	2.9	5		11/22/19 09:36	75-09-2	
Naphthalene	**<5.9**	ug/L	25.0	5.9	5		11/22/19 09:36	91-20-3	
Styrene	**<2.3**	ug/L	7.8	2.3	5		11/22/19 09:36	100-42-5	
Tetrachloroethene	**<1.6**	ug/L	5.4	1.6	5		11/22/19 09:36	127-18-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-6 **Lab ID: 40199588003** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.86**	ug/L	25.0	0.86	5		11/22/19 09:36	108-88-3	
Trichloroethene	**<1.3**	ug/L	5.0	1.3	5		11/22/19 09:36	79-01-6	
Trichlorofluoromethane	**<1.1**	ug/L	5.0	1.1	5		11/22/19 09:36	75-69-4	
Vinyl chloride	**1.1J**	ug/L	5.0	0.87	5		11/22/19 09:36	75-01-4	
cis-1,2-Dichloroethene	**1.9J**	ug/L	5.0	1.4	5		11/22/19 09:36	156-59-2	
cis-1,3-Dichloropropene	**<18.1**	ug/L	60.5	18.1	5		11/22/19 09:36	10061-01-5	
m&p-Xylene	**<2.3**	ug/L	10.0	2.3	5		11/22/19 09:36	179601-23-1	
n-Butylbenzene	**<3.5**	ug/L	11.8	3.5	5		11/22/19 09:36	104-51-8	
n-Propylbenzene	**<4.1**	ug/L	25.0	4.1	5		11/22/19 09:36	103-65-1	
o-Xylene	**<1.3**	ug/L	5.0	1.3	5		11/22/19 09:36	95-47-6	
p-Isopropyltoluene	**<4.0**	ug/L	13.3	4.0	5		11/22/19 09:36	99-87-6	
sec-Butylbenzene	**<4.2**	ug/L	25.0	4.2	5		11/22/19 09:36	135-98-8	
tert-Butylbenzene	**<1.5**	ug/L	5.1	1.5	5		11/22/19 09:36	98-06-6	
trans-1,2-Dichloroethene	**<5.5**	ug/L	18.2	5.5	5		11/22/19 09:36	156-60-5	
trans-1,3-Dichloropropene	**<21.9**	ug/L	72.8	21.9	5		11/22/19 09:36	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	70-130		5		11/22/19 09:36	460-00-4	D3
Dibromofluoromethane (S)	102	%	70-130		5		11/22/19 09:36	1868-53-7	
Toluene-d8 (S)	100	%	70-130		5		11/22/19 09:36	2037-26-5	

Sample: MW-7 **Lab ID: 40199588004** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 09:58	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		11/22/19 09:58	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 09:58	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 09:58	79-00-5	
1,1-Dichloroethane	**1.3**	ug/L	1.0	0.27	1		11/22/19 09:58	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 09:58	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 09:58	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 09:58	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 09:58	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 09:58	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 09:58	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 09:58	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 09:58	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 09:58	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 09:58	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 09:58	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 09:58	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 09:58	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 09:58	142-28-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-7 **Lab ID: 40199588004** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 09:58	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 09:58	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 09:58	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 09:58	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 09:58	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 09:58	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 09:58	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 09:58	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 09:58	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 09:58	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 09:58	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 09:58	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		11/22/19 09:58	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 09:58	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 09:58	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 09:58	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 09:58	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 09:58	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 09:58	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 09:58	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 09:58	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 09:58	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 09:58	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 09:58	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 09:58	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 09:58	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 09:58	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 09:58	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 09:58	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 09:58	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 09:58	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		11/22/19 09:58	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 09:58	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 09:58	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 09:58	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 09:58	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 09:58	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 09:58	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 09:58	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 09:58	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 09:58	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 09:58	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		11/22/19 09:58	460-00-4	
Dibromofluoromethane (S)	101	%	70-130		1		11/22/19 09:58	1868-53-7	
Toluene-d8 (S)	101	%	70-130		1		11/22/19 09:58	2037-26-5	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-9 **Lab ID: 40199588005** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 14:04	630-20-6	
1,1,1-Trichloroethane	**0.55J**	ug/L	1.0	0.24	1		11/22/19 14:04	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 14:04	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 14:04	79-00-5	
1,1-Dichloroethane	**1.6**	ug/L	1.0	0.27	1		11/22/19 14:04	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 14:04	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 14:04	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 14:04	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 14:04	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 14:04	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 14:04	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 14:04	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 14:04	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 14:04	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 14:04	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 14:04	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 14:04	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 14:04	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 14:04	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 14:04	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 14:04	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 14:04	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 14:04	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 14:04	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 14:04	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 14:04	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 14:04	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 14:04	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 14:04	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 14:04	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 14:04	108-90-7	
Chloroethane	**1.8J**	ug/L	5.0	1.3	1		11/22/19 14:04	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 14:04	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 14:04	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 14:04	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 14:04	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 14:04	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 14:04	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 14:04	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 14:04	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 14:04	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 14:04	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 14:04	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 14:04	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 14:04	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 14:04	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-9 **Lab ID: 40199588005** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 14:04	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 14:04	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 14:04	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 14:04	75-01-4	
cis-1,2-Dichloroethene	**1.3**	ug/L	1.0	0.27	1		11/22/19 14:04	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 14:04	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 14:04	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 14:04	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 14:04	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 14:04	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 14:04	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 14:04	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 14:04	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 14:04	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 14:04	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	95	%	70-130		1		11/22/19 14:04	460-00-4	
Dibromofluoromethane (S)	103	%	70-130		1		11/22/19 14:04	1868-53-7	
Toluene-d8 (S)	100	%	70-130		1		11/22/19 14:04	2037-26-5	

Sample: MW-10 **Lab ID: 40199588006** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 14:27	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		11/22/19 14:27	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 14:27	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 14:27	79-00-5	
1,1-Dichloroethane	**1.5**	ug/L	1.0	0.27	1		11/22/19 14:27	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 14:27	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 14:27	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 14:27	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 14:27	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 14:27	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 14:27	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 14:27	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 14:27	106-93-4	
1,2-Dichlorobenzene	**1.4J**	ug/L	2.4	0.71	1		11/22/19 14:27	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 14:27	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 14:27	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 14:27	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 14:27	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 14:27	142-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-10 **Lab ID: 40199588006** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 14:27	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 14:27	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 14:27	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 14:27	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 14:27	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 14:27	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 14:27	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 14:27	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 14:27	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 14:27	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 14:27	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 14:27	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		11/22/19 14:27	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 14:27	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 14:27	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 14:27	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 14:27	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 14:27	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 14:27	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 14:27	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 14:27	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 14:27	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 14:27	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 14:27	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 14:27	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 14:27	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 14:27	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 14:27	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 14:27	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 14:27	75-69-4	
Vinyl chloride	**214**	ug/L	1.0	0.17	1		11/22/19 14:27	75-01-4	
cis-1,2-Dichloroethene	**0.76J**	ug/L	1.0	0.27	1		11/22/19 14:27	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 14:27	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 14:27	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 14:27	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 14:27	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 14:27	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 14:27	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 14:27	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 14:27	98-06-6	
trans-1,2-Dichloroethene	**4.5**	ug/L	3.6	1.1	1		11/22/19 14:27	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 14:27	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	70-130		1		11/22/19 14:27	460-00-4	
Dibromofluoromethane (S)	103	%	70-130		1		11/22/19 14:27	1868-53-7	
Toluene-d8 (S)	101	%	70-130		1		11/22/19 14:27	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-17 **Lab ID: 40199588007** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 16:59	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		11/22/19 16:59	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 16:59	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 16:59	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 16:59	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 16:59	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 16:59	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 16:59	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 16:59	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 16:59	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 16:59	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 16:59	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 16:59	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 16:59	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 16:59	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 16:59	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 16:59	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 16:59	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 16:59	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 16:59	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 16:59	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 16:59	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 16:59	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 16:59	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 16:59	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 16:59	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 16:59	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 16:59	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 16:59	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 16:59	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 16:59	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		11/22/19 16:59	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 16:59	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 16:59	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 16:59	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 16:59	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 16:59	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 16:59	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 16:59	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 16:59	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 16:59	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 16:59	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 16:59	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 16:59	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 16:59	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 16:59	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-17 **Lab ID: 40199588007** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 16:59	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 16:59	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 16:59	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 16:59	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		11/22/19 16:59	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 16:59	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 16:59	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 16:59	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 16:59	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 16:59	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 16:59	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 16:59	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 16:59	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 16:59	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 16:59	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	95	%	70-130		1		11/22/19 16:59	460-00-4	
Dibromofluoromethane (S)	103	%	70-130		1		11/22/19 16:59	1868-53-7	
Toluene-d8 (S)	101	%	70-130		1		11/22/19 16:59	2037-26-5	

Sample: MW-22 **Lab ID: 40199588008** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 17:21	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		11/22/19 17:21	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 17:21	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 17:21	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 17:21	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 17:21	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 17:21	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 17:21	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 17:21	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 17:21	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 17:21	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 17:21	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 17:21	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 17:21	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 17:21	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 17:21	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 17:21	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 17:21	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 17:21	142-28-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-22 **Lab ID: 40199588008** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 17:21	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 17:21	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 17:21	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 17:21	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 17:21	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 17:21	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 17:21	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 17:21	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 17:21	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 17:21	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 17:21	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 17:21	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		11/22/19 17:21	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 17:21	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 17:21	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 17:21	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 17:21	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 17:21	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 17:21	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 17:21	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 17:21	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 17:21	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 17:21	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 17:21	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 17:21	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 17:21	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 17:21	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 17:21	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 17:21	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 17:21	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 17:21	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		11/22/19 17:21	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 17:21	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 17:21	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 17:21	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 17:21	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 17:21	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 17:21	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 17:21	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 17:21	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 17:21	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 17:21	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	93	%	70-130		1		11/22/19 17:21	460-00-4	
Dibromofluoromethane (S)	102	%	70-130		1		11/22/19 17:21	1868-53-7	
Toluene-d8 (S)	101	%	70-130		1		11/22/19 17:21	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-23 **Lab ID: 40199588009** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 17:43	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		11/22/19 17:43	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 17:43	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 17:43	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 17:43	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 17:43	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 17:43	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 17:43	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 17:43	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 17:43	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 17:43	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 17:43	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 17:43	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 17:43	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 17:43	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 17:43	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 17:43	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 17:43	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 17:43	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 17:43	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 17:43	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 17:43	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 17:43	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 17:43	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 17:43	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 17:43	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 17:43	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 17:43	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 17:43	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 17:43	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 17:43	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		11/22/19 17:43	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 17:43	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 17:43	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 17:43	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 17:43	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 17:43	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 17:43	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 17:43	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 17:43	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 17:43	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 17:43	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 17:43	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 17:43	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 17:43	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 17:43	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-23 **Lab ID: 40199588009** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 17:43	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 17:43	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 17:43	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 17:43	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		11/22/19 17:43	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 17:43	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 17:43	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 17:43	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 17:43	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 17:43	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 17:43	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 17:43	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 17:43	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 17:43	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 17:43	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	94	%	70-130		1		11/22/19 17:43	460-00-4	
Dibromofluoromethane (S)	104	%	70-130		1		11/22/19 17:43	1868-53-7	
Toluene-d8 (S)	100	%	70-130		1		11/22/19 17:43	2037-26-5	

Sample: MW-25 **Lab ID: 40199588010** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 18:06	630-20-6	
1,1,1-Trichloroethane	**3.5**	ug/L	1.0	0.24	1		11/22/19 18:06	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 18:06	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 18:06	79-00-5	
1,1-Dichloroethane	**104**	ug/L	1.0	0.27	1		11/22/19 18:06	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 18:06	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 18:06	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 18:06	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 18:06	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 18:06	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 18:06	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 18:06	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 18:06	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 18:06	95-50-1	
1,2-Dichloroethane	**0.47J**	ug/L	1.0	0.28	1		11/22/19 18:06	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 18:06	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 18:06	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 18:06	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 18:06	142-28-9	

REPORT OF LABORATORY ANALYSIS

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(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: MW-25 **Lab ID: 40199588010** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 18:06	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 18:06	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 18:06	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 18:06	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 18:06	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 18:06	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 18:06	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 18:06	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 18:06	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 18:06	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 18:06	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 18:06	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		11/22/19 18:06	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 18:06	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 18:06	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 18:06	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 18:06	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 18:06	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 18:06	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 18:06	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 18:06	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 18:06	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 18:06	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 18:06	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 18:06	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 18:06	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 18:06	127-18-4	
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 18:06	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 18:06	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 18:06	75-69-4	
Vinyl chloride	**0.82J**	ug/L	1.0	0.17	1		11/22/19 18:06	75-01-4	
cis-1,2-Dichloroethene	**3.6**	ug/L	1.0	0.27	1		11/22/19 18:06	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 18:06	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 18:06	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 18:06	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 18:06	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 18:06	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 18:06	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 18:06	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 18:06	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 18:06	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 18:06	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	95	%	70-130		1		11/22/19 18:06	460-00-4	
Dibromofluoromethane (S)	105	%	70-130		1		11/22/19 18:06	1868-53-7	
Toluene-d8 (S)	100	%	70-130		1		11/22/19 18:06	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: TRIP BLANK **Lab ID: 40199588011** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
1,1,1,2-Tetrachloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 16:14	630-20-6	
1,1,1-Trichloroethane	**<0.24**	ug/L	1.0	0.24	1		11/22/19 16:14	71-55-6	
1,1,2,2-Tetrachloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 16:14	79-34-5	
1,1,2-Trichloroethane	**<0.55**	ug/L	5.0	0.55	1		11/22/19 16:14	79-00-5	
1,1-Dichloroethane	**<0.27**	ug/L	1.0	0.27	1		11/22/19 16:14	75-34-3	
1,1-Dichloroethene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 16:14	75-35-4	
1,1-Dichloropropene	**<0.54**	ug/L	1.8	0.54	1		11/22/19 16:14	563-58-6	
1,2,3-Trichlorobenzene	**<0.63**	ug/L	5.0	0.63	1		11/22/19 16:14	87-61-6	
1,2,3-Trichloropropane	**<0.59**	ug/L	5.0	0.59	1		11/22/19 16:14	96-18-4	
1,2,4-Trichlorobenzene	**<0.95**	ug/L	5.0	0.95	1		11/22/19 16:14	120-82-1	
1,2,4-Trimethylbenzene	**<0.84**	ug/L	2.8	0.84	1		11/22/19 16:14	95-63-6	
1,2-Dibromo-3-chloropropane	**<1.8**	ug/L	5.9	1.8	1		11/22/19 16:14	96-12-8	
1,2-Dibromoethane (EDB)	**<0.83**	ug/L	2.8	0.83	1		11/22/19 16:14	106-93-4	
1,2-Dichlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 16:14	95-50-1	
1,2-Dichloroethane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 16:14	107-06-2	
1,2-Dichloropropane	**<0.28**	ug/L	1.0	0.28	1		11/22/19 16:14	78-87-5	
1,3,5-Trimethylbenzene	**<0.87**	ug/L	2.9	0.87	1		11/22/19 16:14	108-67-8	
1,3-Dichlorobenzene	**<0.63**	ug/L	2.1	0.63	1		11/22/19 16:14	541-73-1	
1,3-Dichloropropane	**<0.83**	ug/L	2.8	0.83	1		11/22/19 16:14	142-28-9	
1,4-Dichlorobenzene	**<0.94**	ug/L	3.1	0.94	1		11/22/19 16:14	106-46-7	
2,2-Dichloropropane	**<2.3**	ug/L	7.6	2.3	1		11/22/19 16:14	594-20-7	
2-Chlorotoluene	**<0.93**	ug/L	5.0	0.93	1		11/22/19 16:14	95-49-8	
4-Chlorotoluene	**<0.76**	ug/L	2.5	0.76	1		11/22/19 16:14	106-43-4	
Benzene	**<0.25**	ug/L	1.0	0.25	1		11/22/19 16:14	71-43-2	
Bromobenzene	**<0.24**	ug/L	1.0	0.24	1		11/22/19 16:14	108-86-1	
Bromochloromethane	**<0.36**	ug/L	5.0	0.36	1		11/22/19 16:14	74-97-5	
Bromodichloromethane	**<0.36**	ug/L	1.2	0.36	1		11/22/19 16:14	75-27-4	
Bromoform	**<4.0**	ug/L	13.2	4.0	1		11/22/19 16:14	75-25-2	
Bromomethane	**<0.97**	ug/L	5.0	0.97	1		11/22/19 16:14	74-83-9	
Carbon tetrachloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 16:14	56-23-5	
Chlorobenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 16:14	108-90-7	
Chloroethane	**<1.3**	ug/L	5.0	1.3	1		11/22/19 16:14	75-00-3	
Chloroform	**<1.3**	ug/L	5.0	1.3	1		11/22/19 16:14	67-66-3	
Chloromethane	**<2.2**	ug/L	7.3	2.2	1		11/22/19 16:14	74-87-3	
Dibromochloromethane	**<2.6**	ug/L	8.7	2.6	1		11/22/19 16:14	124-48-1	
Dibromomethane	**<0.94**	ug/L	3.1	0.94	1		11/22/19 16:14	74-95-3	
Dichlorodifluoromethane	**<0.50**	ug/L	5.0	0.50	1		11/22/19 16:14	75-71-8	
Diisopropyl ether	**<1.9**	ug/L	6.3	1.9	1		11/22/19 16:14	108-20-3	
Ethylbenzene	**<0.22**	ug/L	1.0	0.22	1		11/22/19 16:14	100-41-4	
Hexachloro-1,3-butadiene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 16:14	87-68-3	
Isopropylbenzene (Cumene)	**<0.39**	ug/L	5.0	0.39	1		11/22/19 16:14	98-82-8	
Methyl-tert-butyl ether	**<1.2**	ug/L	4.2	1.2	1		11/22/19 16:14	1634-04-4	
Methylene Chloride	**<0.58**	ug/L	5.0	0.58	1		11/22/19 16:14	75-09-2	
Naphthalene	**<1.2**	ug/L	5.0	1.2	1		11/22/19 16:14	91-20-3	
Styrene	**<0.47**	ug/L	1.6	0.47	1		11/22/19 16:14	100-42-5	
Tetrachloroethene	**<0.33**	ug/L	1.1	0.33	1		11/22/19 16:14	127-18-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Sample: TRIP BLANK **Lab ID: 40199588011** Collected: 11/19/19 00:00 Received: 11/21/19 08:45 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
8260 MSV	Analytical Method: EPA 8260								
Toluene	**<0.17**	ug/L	5.0	0.17	1		11/22/19 16:14	108-88-3	
Trichloroethene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 16:14	79-01-6	
Trichlorofluoromethane	**<0.21**	ug/L	1.0	0.21	1		11/22/19 16:14	75-69-4	
Vinyl chloride	**<0.17**	ug/L	1.0	0.17	1		11/22/19 16:14	75-01-4	
cis-1,2-Dichloroethene	**<0.27**	ug/L	1.0	0.27	1		11/22/19 16:14	156-59-2	
cis-1,3-Dichloropropene	**<3.6**	ug/L	12.1	3.6	1		11/22/19 16:14	10061-01-5	
m&p-Xylene	**<0.47**	ug/L	2.0	0.47	1		11/22/19 16:14	179601-23-1	
n-Butylbenzene	**<0.71**	ug/L	2.4	0.71	1		11/22/19 16:14	104-51-8	
n-Propylbenzene	**<0.81**	ug/L	5.0	0.81	1		11/22/19 16:14	103-65-1	
o-Xylene	**<0.26**	ug/L	1.0	0.26	1		11/22/19 16:14	95-47-6	
p-Isopropyltoluene	**<0.80**	ug/L	2.7	0.80	1		11/22/19 16:14	99-87-6	
sec-Butylbenzene	**<0.85**	ug/L	5.0	0.85	1		11/22/19 16:14	135-98-8	
tert-Butylbenzene	**<0.30**	ug/L	1.0	0.30	1		11/22/19 16:14	98-06-6	
trans-1,2-Dichloroethene	**<1.1**	ug/L	3.6	1.1	1		11/22/19 16:14	156-60-5	
trans-1,3-Dichloropropene	**<4.4**	ug/L	14.6	4.4	1		11/22/19 16:14	10061-02-6	
Surrogates									
4-Bromofluorobenzene (S)	96	%	70-130		1		11/22/19 16:14	460-00-4	
Dibromofluoromethane (S)	102	%	70-130		1		11/22/19 16:14	1868-53-7	
Toluene-d8 (S)	101	%	70-130		1		11/22/19 16:14	2037-26-5	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

QC Batch: 341529 Analysis Method: EPA 8260
QC Batch Method: EPA 8260 Analysis Description: 8260 MSV
Associated Lab Samples: 40199588001, 40199588002, 40199588003, 40199588004, 40199588005, 40199588006, 40199588007, 40199588008, 40199588009, 40199588010, 40199588011

METHOD BLANK: 1983604 Matrix: Water
Associated Lab Samples: 40199588001, 40199588002, 40199588003, 40199588004, 40199588005, 40199588006, 40199588007, 40199588008, 40199588009, 40199588010, 40199588011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1,2-Tetrachloroethane	ug/L	<0.27	1.0	11/22/19 07:21	
1,1,1-Trichloroethane	ug/L	<0.24	1.0	11/22/19 07:21	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	1.0	11/22/19 07:21	
1,1,2-Trichloroethane	ug/L	<0.55	5.0	11/22/19 07:21	
1,1-Dichloroethane	ug/L	<0.27	1.0	11/22/19 07:21	
1,1-Dichloroethene	ug/L	<0.24	1.0	11/22/19 07:21	
1,1-Dichloropropene	ug/L	<0.54	1.8	11/22/19 07:21	
1,2,3-Trichlorobenzene	ug/L	<0.63	5.0	11/22/19 07:21	
1,2,3-Trichloropropane	ug/L	<0.59	5.0	11/22/19 07:21	
1,2,4-Trichlorobenzene	ug/L	<0.95	5.0	11/22/19 07:21	
1,2,4-Trimethylbenzene	ug/L	<0.84	2.8	11/22/19 07:21	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	5.9	11/22/19 07:21	
1,2-Dibromoethane (EDB)	ug/L	<0.83	2.8	11/22/19 07:21	
1,2-Dichlorobenzene	ug/L	<0.71	2.4	11/22/19 07:21	
1,2-Dichloroethane	ug/L	<0.28	1.0	11/22/19 07:21	
1,2-Dichloropropane	ug/L	<0.28	1.0	11/22/19 07:21	
1,3,5-Trimethylbenzene	ug/L	<0.87	2.9	11/22/19 07:21	
1,3-Dichlorobenzene	ug/L	<0.63	2.1	11/22/19 07:21	
1,3-Dichloropropane	ug/L	<0.83	2.8	11/22/19 07:21	
1,4-Dichlorobenzene	ug/L	<0.94	3.1	11/22/19 07:21	
2,2-Dichloropropane	ug/L	<2.3	7.6	11/22/19 07:21	
2-Chlorotoluene	ug/L	<0.93	5.0	11/22/19 07:21	
4-Chlorotoluene	ug/L	<0.76	2.5	11/22/19 07:21	
Benzene	ug/L	<0.25	1.0	11/22/19 07:21	
Bromobenzene	ug/L	<0.24	1.0	11/22/19 07:21	
Bromochloromethane	ug/L	<0.36	5.0	11/22/19 07:21	
Bromodichloromethane	ug/L	<0.36	1.2	11/22/19 07:21	
Bromoform	ug/L	<4.0	13.2	11/22/19 07:21	
Bromomethane	ug/L	<0.97	5.0	11/22/19 07:21	
Carbon tetrachloride	ug/L	<0.17	1.0	11/22/19 07:21	
Chlorobenzene	ug/L	<0.71	2.4	11/22/19 07:21	
Chloroethane	ug/L	<1.3	5.0	11/22/19 07:21	
Chloroform	ug/L	<1.3	5.0	11/22/19 07:21	
Chloromethane	ug/L	<2.2	7.3	11/22/19 07:21	
cis-1,2-Dichloroethene	ug/L	<0.27	1.0	11/22/19 07:21	
cis-1,3-Dichloropropene	ug/L	<3.6	12.1	11/22/19 07:21	
Dibromochloromethane	ug/L	<2.6	8.7	11/22/19 07:21	
Dibromomethane	ug/L	<0.94	3.1	11/22/19 07:21	
Dichlorodifluoromethane	ug/L	<0.50	5.0	11/22/19 07:21	
Diisopropyl ether	ug/L	<1.9	6.3	11/22/19 07:21	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

METHOD BLANK: 1983604 Matrix: Water

Associated Lab Samples: 40199588001, 40199588002, 40199588003, 40199588004, 40199588005, 40199588006, 40199588007, 40199588008, 40199588009, 40199588010, 40199588011

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Ethylbenzene	ug/L	<0.22	1.0	11/22/19 07:21	
Hexachloro-1,3-butadiene	ug/L	<1.2	5.0	11/22/19 07:21	
Isopropylbenzene (Cumene)	ug/L	<0.39	5.0	11/22/19 07:21	
m&p-Xylene	ug/L	<0.47	2.0	11/22/19 07:21	
Methyl-tert-butyl ether	ug/L	<1.2	4.2	11/22/19 07:21	
Methylene Chloride	ug/L	<0.58	5.0	11/22/19 07:21	
n-Butylbenzene	ug/L	<0.71	2.4	11/22/19 07:21	
n-Propylbenzene	ug/L	<0.81	5.0	11/22/19 07:21	
Naphthalene	ug/L	<1.2	5.0	11/22/19 07:21	
o-Xylene	ug/L	<0.26	1.0	11/22/19 07:21	
p-Isopropyltoluene	ug/L	<0.80	2.7	11/22/19 07:21	
sec-Butylbenzene	ug/L	<0.85	5.0	11/22/19 07:21	
Styrene	ug/L	<0.47	1.6	11/22/19 07:21	
tert-Butylbenzene	ug/L	<0.30	1.0	11/22/19 07:21	
Tetrachloroethene	ug/L	<0.33	1.1	11/22/19 07:21	
Toluene	ug/L	<0.17	5.0	11/22/19 07:21	
trans-1,2-Dichloroethene	ug/L	<1.1	3.6	11/22/19 07:21	
trans-1,3-Dichloropropene	ug/L	<4.4	14.6	11/22/19 07:21	
Trichloroethene	ug/L	<0.26	1.0	11/22/19 07:21	
Trichlorofluoromethane	ug/L	<0.21	1.0	11/22/19 07:21	
Vinyl chloride	ug/L	<0.17	1.0	11/22/19 07:21	
4-Bromofluorobenzene (S)	%	95	70-130	11/22/19 07:21	
Dibromofluoromethane (S)	%	103	70-130	11/22/19 07:21	
Toluene-d8 (S)	%	100	70-130	11/22/19 07:21	

LABORATORY CONTROL SAMPLE: 1983605

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/L	50	53.3	107	70-130	
1,1,2,2-Tetrachloroethane	ug/L	50	48.0	96	70-130	
1,1,2-Trichloroethane	ug/L	50	50.5	101	70-130	
1,1-Dichloroethane	ug/L	50	51.5	103	73-150	
1,1-Dichloroethene	ug/L	50	46.8	94	73-138	
1,2,4-Trichlorobenzene	ug/L	50	43.2	86	70-130	
1,2-Dibromo-3-chloropropane	ug/L	50	39.5	79	64-129	
1,2-Dibromoethane (EDB)	ug/L	50	48.4	97	70-130	
1,2-Dichlorobenzene	ug/L	50	49.2	98	70-130	
1,2-Dichloroethane	ug/L	50	53.1	106	75-140	
1,2-Dichloropropane	ug/L	50	51.5	103	73-135	
1,3-Dichlorobenzene	ug/L	50	48.6	97	70-130	
1,4-Dichlorobenzene	ug/L	50	49.7	99	70-130	
Benzene	ug/L	50	52.2	104	70-130	
Bromodichloromethane	ug/L	50	50.3	101	70-130	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

LABORATORY CONTROL SAMPLE: 1983605

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Bromoform	ug/L	50	43.6	87	68-129	
Bromomethane	ug/L	50	36.0	72	18-159	
Carbon tetrachloride	ug/L	50	51.7	103	70-130	
Chlorobenzene	ug/L	50	50.8	102	70-130	
Chloroethane	ug/L	50	50.5	101	53-147	
Chloroform	ug/L	50	52.4	105	74-136	
Chloromethane	ug/L	50	32.8	66	29-115	
cis-1,2-Dichloroethene	ug/L	50	50.7	101	70-130	
cis-1,3-Dichloropropene	ug/L	50	47.5	95	70-130	
Dibromochloromethane	ug/L	50	48.4	97	70-130	
Dichlorodifluoromethane	ug/L	50	43.2	86	10-130	
Ethylbenzene	ug/L	50	49.3	99	80-124	
Isopropylbenzene (Cumene)	ug/L	50	47.5	95	70-130	
m&p-Xylene	ug/L	100	99.8	100	70-130	
Methyl-tert-butyl ether	ug/L	50	41.7	83	54-137	
Methylene Chloride	ug/L	50	47.5	95	73-138	
o-Xylene	ug/L	50	48.5	97	70-130	
Styrene	ug/L	50	51.1	102	70-130	
Tetrachloroethene	ug/L	50	50.3	101	70-130	
Toluene	ug/L	50	51.0	102	80-126	
trans-1,2-Dichloroethene	ug/L	50	49.8	100	73-145	
trans-1,3-Dichloropropene	ug/L	50	43.7	87	70-130	
Trichloroethene	ug/L	50	54.6	109	70-130	
Trichlorofluoromethane	ug/L	50	54.1	108	76-147	
Vinyl chloride	ug/L	50	43.8	88	51-120	
4-Bromofluorobenzene (S)	%			98	70-130	
Dibromofluoromethane (S)	%			104	70-130	
Toluene-d8 (S)	%			98	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1983645 1983646

Parameter	Units	40199588001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,1,1-Trichloroethane	ug/L	1.4	250	250	268	276	107	110	70-130	3	20	
1,1,2,2-Tetrachloroethane	ug/L	<0.28	250	250	249	251	100	100	70-130	1	20	
1,1,2-Trichloroethane	ug/L	<0.55	250	250	251	255	100	102	70-137	2	20	
1,1-Dichloroethane	ug/L	53.9	250	250	306	310	101	103	73-153	2	20	
1,1-Dichloroethene	ug/L	<0.24	250	250	236	240	94	96	73-138	2	20	
1,2,4-Trichlorobenzene	ug/L	<0.95	250	250	227	226	91	90	70-130	0	20	
1,2-Dibromo-3-chloropropane	ug/L	<1.8	250	250	219	221	88	89	58-129	1	20	
1,2-Dibromoethane (EDB)	ug/L	<0.83	250	250	243	248	97	99	70-130	2	20	
1,2-Dichlorobenzene	ug/L	<0.71	250	250	246	251	99	101	70-130	2	20	
1,2-Dichloroethane	ug/L	<0.28	250	250	247	259	99	103	75-140	5	20	
1,2-Dichloropropane	ug/L	<0.28	250	250	252	259	101	104	71-138	3	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1983645 1983646

Parameter	Units	40199588001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
1,3-Dichlorobenzene	ug/L	<0.63	250	250	251	251	100	100	70-130	0	20	
1,4-Dichlorobenzene	ug/L	<0.94	250	250	254	256	101	102	70-130	1	20	
Benzene	ug/L	0.29J	250	250	258	265	103	106	70-130	3	20	
Bromodichloromethane	ug/L	<0.36	250	250	246	248	98	99	70-130	1	20	
Bromoform	ug/L	<4.0	250	250	218	223	87	89	68-129	2	20	
Bromomethane	ug/L	<0.97	250	250	210	214	84	86	15-170	2	20	
Carbon tetrachloride	ug/L	<0.17	250	250	259	266	103	107	70-130	3	20	
Chlorobenzene	ug/L	<0.71	250	250	256	261	103	104	70-130	2	20	
Chloroethane	ug/L	17.1	250	250	263	270	98	101	51-148	2	20	
Chloroform	ug/L	<1.3	250	250	257	262	103	105	74-136	2	20	
Chloromethane	ug/L	<2.2	250	250	170	171	68	68	23-115	1	20	
cis-1,2-Dichloroethene	ug/L	0.65J	250	250	250	255	100	102	70-131	2	20	
cis-1,3-Dichloropropene	ug/L	<3.6	250	250	229	235	92	94	70-130	2	20	
Dibromochloromethane	ug/L	<2.6	250	250	239	243	95	97	70-130	2	20	
Dichlorodifluoromethane	ug/L	<0.50	250	250	213	216	85	86	10-132	1	20	
Ethylbenzene	ug/L	<0.22	250	250	253	258	101	103	80-125	2	20	
Isopropylbenzene (Cumene)	ug/L	<0.39	250	250	241	247	97	99	70-130	2	20	
m&p-Xylene	ug/L	<0.47	500	500	509	517	102	103	70-130	2	20	
Methyl-tert-butyl ether	ug/L	<1.2	250	250	195	203	78	81	51-145	4	20	
Methylene Chloride	ug/L	<0.58	250	250	230	235	92	94	73-140	2	20	
o-Xylene	ug/L	<0.26	250	250	244	248	98	99	70-130	2	20	
Styrene	ug/L	<0.47	250	250	257	260	103	104	70-130	1	20	
Tetrachloroethene	ug/L	<0.33	250	250	263	264	105	106	70-130	0	20	
Toluene	ug/L	0.38J	250	250	264	268	105	107	80-131	2	20	
trans-1,2-Dichloroethene	ug/L	<1.1	250	250	249	256	100	102	73-148	3	20	
trans-1,3-Dichloropropene	ug/L	<4.4	250	250	218	224	87	90	70-130	3	20	
Trichloroethene	ug/L	<0.26	250	250	271	277	108	111	70-130	2	20	
Trichlorofluoromethane	ug/L	<0.21	250	250	273	275	109	110	74-147	1	20	
Vinyl chloride	ug/L	3.9	250	250	227	232	89	91	41-129	2	20	
4-Bromofluorobenzene (S)	%						97	96	70-130			
Dibromofluoromethane (S)	%						101	101	70-130			
Toluene-d8 (S)	%						100	100	70-130			

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALIFIERS

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor, percent moisture, initial weight and final volume.

LOQ - Limit of Quantitation adjusted for dilution factor, percent moisture, initial weight and final volume.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected at or above the adjusted LOD.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
Green Bay, WI 54302
(920)469-2436

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TD P3 4TH QTR GW
Pace Project No.: 40199588

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40199588001	MW-1	EPA 8260	341529		
40199588002	MW-2	EPA 8260	341529		
40199588003	MW-6	EPA 8260	341529		
40199588004	MW-7	EPA 8260	341529		
40199588005	MW-9	EPA 8260	341529		
40199588006	MW-10	EPA 8260	341529		
40199588007	MW-17	EPA 8260	341529		
40199588008	MW-22	EPA 8260	341529		
40199588009	MW-23	EPA 8260	341529		
40199588010	MW-25	EPA 8260	341529		
40199588011	TRIP BLANK	EPA 8260	341529		

Pace Analytical™ www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

40199588

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Environmental Audits Inc.	Report To:	jrruetz@yahoo.com;	Attention:	John Ruetz
Address:	11327 W Lincoln Avenue	Copy To:	eeriii@wi.rr.com; john@environmentalaudits.net	Company Name:	Environmental Audits Inc.
	West Allis Wi 53051		steph@environmentalaudits.net	Address:	11327 W Lincoln Avenue
Email To:	john@environmentalaudits.net	Purchase Order No.:	Verbal	Pace Quote Reference:	
Phone:	414-226-5563 Fax:	Project Name:	TD P3 4th Qtr GW	Pace Project Manager:	
Requested Due Date/TAT:		Project Number:		Pace Profile #:	

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER

UST RCRA OTHER

Site Location STATE: WI

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: VOC	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-1	GW	G			11/19/19	PM		3				X					N	X		001
2	MW-2					11/19/19	PM		3				X						X		002
3	MW-6					11/19/19	PM		3				X						X		003
4	MW-7					11/19/19	PM		3				X						X		004
5	MW-9					11/19/19	PM		3				X						X		005
6	MW-10					11/19/19	PM		3				X						X		006
7	MW-17					11/19/19	PM		3				X						X		007
8	MW-22					11/19/19	PM		3				X						X		008
9	MW-23					11/19/19	PM		3				X						X		009
10	MW-25					11/19/19	PM		3				X						X		010
11	Trip Blank ①																				011
12																					012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
① To ship most Lab added to COC 11/21/19 SW	Steve Tiber	11/20/19	2:35pm	Mary Fanning	11/20/19	2:35pm				
	Mary Fanning	11/20/19	3:00pm							
		11/21/19	0845	Susan Kilgore	11/21/19	0845	ROI	Y	Y	Y

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Steve Tiber		
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY):	11/20/19

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

Pace Analytical Services, LLC
1241 Bellevue Street, Suite 9
Green Bay, WI 54302

Sample Preservation Receipt Form

Client Name: Env. Audets Project # 40199588

All containers needing preservation have been checked and noted below: □Yes □No ☒N/A Initial when completed: Date/ Time:

Lab Lot# of pH paper: Lab Std #ID of preservation (if pH adjusted):

Pace Lab #	Glass: AG1U	AG1H	AG4S	AG4U	AG5U	AG2S	BG3U	Plastic: BP1U	BP2N	BP2Z	BP3U	BP3B	BP3N	BP3S	Vials: DG9A	DG9T	VG9U	VG9H	VG9M	VG9D	Jars: JGFU	WGFU	WPFU	General: SP5T	ZPLC	GN	VOA Vials (>6mm) *	H2SO4 pH ≤2	NaOH+Zn Act pH ≥9	NaOH pH ≥12	HNO3 pH ≤2	pH after adjusted	Volume (mL)
001																	3																2.5 / 5 / 10
002																	3																2.5 / 5 / 10
003																	3																2.5 / 5 / 10
004																	3																2.5 / 5 / 10
005																	3																2.5 / 5 / 10
006																	3																2.5 / 5 / 10
007																	3																2.5 / 5 / 10
008																	3																2.5 / 5 / 10
009																	3																2.5 / 5 / 10
010																	3																2.5 / 5 / 10
011																	1																2.5 / 5 / 10
012																																	2.5 / 5 / 10
013																																	2.5 / 5 / 10
014																																	2.5 / 5 / 10
015																																	2.5 / 5 / 10
016																																	2.5 / 5 / 10
017																																	2.5 / 5 / 10
018																																	2.5 / 5 / 10
019																										11/21/19		8U					2.5 / 5 / 10
020																																	2.5 / 5 / 10

Exceptions to preservation check: VOA, Coliform, TOC, TOX, TOH, O&G, WI DRO, Phenolics, Other: _____ Headspace in VOA Vials (>6mm) : □Yes □No □N/A ***If yes look in headspace column**

AG1U	1 liter amber glass	BP1U	1 liter plastic unpres	DG9A	40 mL amber ascorbic	JGFU	4 oz amber jar unpres
AG1H	1 liter amber glass HCL	BP2N	500 mL plastic HNO3	DG9T	40 mL amber Na Thio	WGFU	4 oz clear jar unpres
AG4S	125 mL amber glass H2SO4	BP2Z	500 mL plastic NaOH, Znact	VG9U	40 mL clear vial unpres	WPFU	4 oz plastic jar unpres
AG4U	120 mL amber glass unpres	BP3U	250 mL plastic unpres	VG9H	40 mL clear vial HCL		
AG5U	100 mL amber glass unpres	BP3B	250 mL plastic NaOH	VG9M	40 mL clear vial MeOH	SP5T	120 mL plastic Na Thiosulfate
AG2S	500 mL amber glass H2SO4	BP3N	250 mL plastic HNO3	VG9D	40 mL clear vial DI	ZPLC	ziploc bag
BG3U	250 mL clear glass unpres	BP3S	250 mL plastic H2SO4			GN:	

Pace Analytical 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 25Apr2018
	Document No.: F-GB-C-031-Rev.07	Issuing Authority: Pace Green Bay Quality Office

Sample Condition Upon Receipt Form (SCUR)

Project #: **WO# : 40199588**

40199588

Client Name: Env. Audits

Courier: ☒ CS Logistics ☐ Fed Ex ☐ Speedee ☐ UPS ☐ Waltco ☐ Client ☐ Pace Other: _____

Tracking #: _____

Custody Seal on Cooler/Box Present: ☒ yes ☐ no Seals intact: ☒ yes ☐ no

Custody Seal on Samples Present: ☐ yes ☒ no Seals intact: ☐ yes ☐ no

Packing Material: ☒ Bubble Wrap ☒ Bubble Bags ☐ None ☐ Other _____

Thermometer Used SR - N/A **Type of Ice:** (Wet) Blue Dry None ☒ Samples on ice, cooling process has begun

Cooler Temperature Uncorr: ROT /Corr: _____

Temp Blank Present: ☐ yes ☒ no **Biological Tissue is Frozen:** ☐ yes ☐ no

Temp should be above freezing to 6°C.
Biota Samples may be received at ≤ 0°C.

Person examining contents:
Date: 11-21-19
Initials: SW

Chain of Custody Present:	☒Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☒Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☒Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☒Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☒Yes ☐No	5.
- VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☒No	6.
Rush Turn Around Time Requested:	☐Yes ☒No	7.
Sufficient Volume:		8.
For Analysis: ☒Yes ☐No MS/MSD:	☐Yes ☒No ☐N/A	
Correct Containers Used:	☒Yes ☐No	9. Client has 1 label for 3 vials 11-21-19 SW
-Pace Containers Used:	☒Yes ☐No ☐N/A	
-Pace IR Containers Used:	☐Yes ☐No ☒N/A	
Containers Intact:	☒Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☒N/A	11.
Sample Labels match COC:	☐Yes ☒No ☐N/A	12. TD PLT 3 B/4 all sample IDs. 11-21-19 SW
-Includes date/time/ID/Analysis Matrix: W		
Trip Blank Present:	☒Yes ☐No ☐N/A	13. In Shipment Lab added to COC 11-21-19 SW
Trip Blank Custody Seals Present	☒Yes ☐No ☐N/A	
Pace Trip Blank Lot # (if purchased): 433		

Client Notification/ Resolution: If checked, see attached form for additional comments ☐

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: PMR for DH **Date:** 11/21/19

APPENDIX III: Mann-Kendall Statistical Tests

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-1

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	1,1-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	TCE Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
1	4-Nov-15	99.40	95.80				121.50
2	15-Jun-16		99.80	0.66	35.20		157.56
3	30-Nov-16		88.70		33.10		142.60
4	16-Jun-17		70.20		7.10		117.50
5	12-Dec-17		67.30		2.50		92.21
6	23-May-18		60.90	0.75	12.10		87.46
7	20-Nov-18		43.60				48.90
8	16-Apr-19		45.30				45.30
9	19-Nov-19		53.90				77.62
10	5-Mar-20		34.40		0.24		45.04
	Mann Kendall Statistic (S) =	0.0	-37.0	1.0	-11.0	0.0	-37.0
	Number of Rounds (n) =	1	10	2	6	0	10
	Average =	99.40	65.99	0.71	15.04	#DIV/0!	93.57
	Standard Deviation =	#DIV/0!	22.770	0.064	15.366	#DIV/0!	40.587
	Coefficient of Variation(CV)=	#DIV/0!	0.345	0.090	1.022	#DIV/0!	0.434
Error Check, Blank if No Errors Detected		n<4		n<4		n<4	
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	n<4	**DECREASING**	n<4	**DECREASING**
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	n<4	**DECREASING**	n<4	**DECREASING**
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	n<4 n<4	NA	n<4 n<4	NA

Data Entry By = EER | Date = 16-Mar-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-1

Event Number	Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	1,1-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	TCE Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
	Compound ->	DRO	1,1-DCA	1,1-DCE	1,1,1-TCA	TCE	Total VOC
1	27-Apr-15	365.00	76.10				90.60
2	4-Nov-15	99.40	95.80				121.50
3	15-Jun-16		99.80	0.66	35.20		157.56
4	30-Nov-16		88.70		33.10		142.60
5	16-Jun-17		70.20		7.10		117.50
6	12-Dec-17		67.30		2.50		92.21
7	23-May-18		60.90	0.75	12.10		87.46
8	20-Nov-18		43.60				48.90
9	16-Apr-19		45.30				45.30
10	19-Nov-19		53.90				77.62
	Mann Kendall Statistic (S) =	-1.0	-31.0	1.0	-6.0	0.0	-27.0
	Number of Rounds (n) =	2	10	2	5	0	10
	Average =	232.20	70.16	0.71	18.00	#DIV/0!	98.13
	Standard Deviation =	187.808	19.991	0.064	15.147	#DIV/0!	36.926
	Coefficient of Variation(CV)=	0.809	0.285	0.090	0.841	#DIV/0!	0.376
Error Check, Blank if No Errors Detected		n<4		n<4		n<4	
Trend ≥ 80% Confidence Level		n<4	DECREASING	n<4	DECREASING	n<4	DECREASING
Trend ≥ 90% Confidence Level		n<4	DECREASING	n<4	No Trend	n<4	DECREASING
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	n<4 n<4	NA	n<4 n<4	NA

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-2

Event Number	Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
	Compound ->						
1	4-Nov-15	646.00	21.60	32.20			
2	15-Jun-16		27.30	77.40			
3	30-Nov-16		29.90	53.60			
4	16-Jun-17		19.40	38.20			
5	12-Dec-17		22.90	34.14			
6	23-May-18		23.80	34.90			
7	20-Nov-18		16.80	16.80			
8	16-Apr-19		18.20	18.20			
9	19-Nov-19		15.40	22.40			
10	5-Mar-20		14.60	14.60			
	Mann Kendall Statistic (S) =	0.0	-27.0	-27.0	0.0	0.0	0.0
	Number of Rounds (n) =	1	10	10	0	0	0
	Average =	646.00	20.99	34.24	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	5.067	19.279	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	0.241	0.563	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	**DECREASING**	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	**DECREASING**	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 16-Mar-20 | Checked By = EER

State of Wisconsin
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Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-2	
	Compound ->	DRO	1,1-DCA	Total VOC			
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	1,070.00	18.30	28.26			
2	4-Nov-15	646.00	21.60	32.20			
3	15-Jun-16		27.30	77.40			
4	30-Nov-16		29.90	53.60			
5	16-Jun-17		19.40	38.20			
6	12-Dec-17		22.90	34.14			
7	23-May-18		23.80	34.90			
8	20-Nov-18		16.80	16.80			
9	16-Apr-19		18.20	18.20			
10	19-Nov-19		15.40	22.40			
	Mann Kendall Statistic (S) =	-1.0	-15.0	-15.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	10	10	0	0	0
	Average =	858.00	21.36	35.61	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	299.813	4.668	18.186	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.349	0.219	0.511	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	**DECREASING**	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	No Trend	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 24-Dec-19		Checked By = EER		

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-6

Event Number	Compound -> / Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	1,1-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	TCE Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
1	4-Nov-15	50.40	138.00	0.45		0.54	196.54
2	8-Jun-16		223.00				257.50
3	30-Nov-16		174.00		16.60		207.40
4	16-Jun-17		125.00				125.00
5	12-Dec-17		137.00		5.00		149.47
6	23-May-18		175.00	2.30	34.10		232.05
7	20-Nov-18		73.20		1.60		76.12
8	16-Apr-19		79.40				79.40
9	19-Nov-19		118.00				128.80
10	5-Mar-20		93.70				100.93
	Mann Kendall Statistic (S) =	0.0	-21.0	1.0	-2.0	0.0	-19.0
	Number of Rounds (n) =	1	10	2	4	1	10
	Average =	50.40	133.63	1.38	14.33	0.54	155.32
	Standard Deviation =	#DIV/0!	46.981	1.308	14.664	#DIV/0!	64.456
	Coefficient of Variation(CV)=	#DIV/0!	0.352	0.951	1.024	#DIV/0!	0.415
Error Check, Blank if No Errors Detected		n<4		n<4		n<4	
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	n<4	No Trend	n<4	**DECREASING**
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	n<4	No Trend	n<4	**DECREASING**
Stability Test, If No Trend Exists at		n<4		n<4	**CV > 1**	n<4	
80% Confidence Level		n<4	NA	n<4	**NON-STABLE**	n<4	NA

Data Entry By = EER | Date = 16-Mar-20 | Checked By = EER

State of Wisconsin
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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-6

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	1,1-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	TCE Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
1	23-Apr-15	406.00	63.80		2.20		149.50
2	4-Nov-15	50.40	138.00	0.45		0.54	196.54
3	8-Jun-16		223.00				257.50
4	30-Nov-16		174.00		16.60		207.40
5	16-Jun-17		125.00				125.00
6	12-Dec-17		137.00		5.00		149.47
7	23-May-18		175.00	2.30	34.10		232.05
8	20-Nov-18		73.20		1.60		76.12
9	16-Apr-19		79.40				79.40
10	19-Nov-19		118.00				128.80
	Mann Kendall Statistic (S) =	-1.0	-7.0	1.0	0.0	0.0	-15.0
	Number of Rounds (n) =	2	10	2	5	1	10
	Average =	228.20	130.64	1.38	11.90	0.54	160.18
	Standard Deviation =	251.447	50.615	1.308	13.809	#DIV/0!	61.672
	Coefficient of Variation(CV)=	1.102	0.387	0.951	1.160	#DIV/0!	0.385
Error Check, Blank if No Errors Detected		n<4		n<4		n<4	
Trend ≥ 80% Confidence Level		n<4	No Trend	n<4	No Trend	n<4	**DECREASING**
Trend ≥ 90% Confidence Level		n<4	No Trend	n<4	No Trend	n<4	No Trend
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	**CV <= 1** **STABLE**	n<4 n<4	**CV > 1** **NON-STABLE**	n<4 n<4	NA

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

State of Wisconsin
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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-7	
	Compound ->	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
Event Number	Sampling Date (most recent last)						
1	4-Nov-15	24.50	2.60	2.60			
2	6-Jun-16		2.70	2.70			
3	16-Nov-16		38.70	80.32			
4	16-Jun-17		5.50	5.50			
5	12-Dec-17		5.60	12.60			
6	23-May-18		52.70	85.90			
7	20-Nov-18		2.00	2.89			
8	16-Apr-19		1.90	1.90			
9	19-Nov-19		1.30	1.30			
10	5-Mar-20		1.30	2.60			
	Mann Kendall Statistic (S) =	0.0	-18.0	-10.0	0.0	0.0	0.0
	Number of Rounds (n) =	1	10	10	0	0	0
	Average =	24.50	11.43	19.83	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	18.425	33.534	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	1.612	1.691	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	No Trend	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	No Trend	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	**CV > 1** **NON-STABLE**	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 5-Mar-20		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

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Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-7	
	Compound ->	DRO	1,1-DCA	Total VOC			
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	109.00	3.60	7.14			
2	4-Nov-15	24.50	2.60	2.60			
3	6-Jun-16		2.70	2.70			
4	16-Nov-16		38.70	80.32			
5	16-Jun-17		5.50	5.50			
6	12-Dec-17		5.60	12.60			
7	23-May-18		52.70	85.90			
8	20-Nov-18		2.00	2.89			
9	16-Apr-19		1.90	1.90			
10	19-Nov-19		1.30	1.30			
	Mann Kendall Statistic (S) =	-1.0	-11.0	-9.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	10	10	0	0	0
	Average =	66.75	11.66	20.29	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	59.751	18.298	33.305	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.895	1.569	1.642	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	No Trend	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	No Trend	n<4	n<4	n<4
Stability Test, If No Trend Exists at		n<4		**CV > 1**	n<4	n<4	n<4
80% Confidence Level		n<4	NA	**NON-STABLE**	n<4	n<4	n<4
	Data Entry By = EER		Date = 24-Dec-19		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-9

	Compound ->	DRO	1,1-DCA	cis-1,2-DCE	Total VOC		
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	11-Nov-15	16.00	6.40	1.00	11.80		
2	8-Jun-16		1.30	1.30	2.60		
3	16-Nov-16		16.30	1.30	39.40		
4	16-Jun-17		1.90	1.00	2.90		
5	12-Dec-17		5.90	1.30	11.80		
6	23-May-18		33.80	0.89	57.69		
7	20-Nov-18		3.90	0.88	5.49		
8	16-Apr-19		1.50	0.85	2.35		
9	19-Nov-19		1.60	1.30	4.70		
10	5-Mar-20		1.60	0.84	2.44		
	Mann Kendall Statistic (S) =	0.0	-10.0	-20.0	-12.0	0.0	0.0
	Number of Rounds (n) =	1	10	10	10	0	0
	Average =	16.00	7.42	1.07	14.12	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	10.334	0.208	18.988	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	1.393	0.196	1.345	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4				n<4	n<4
Trend ≥ 80% Confidence Level		n<4	No Trend	**DECREASING**	**DECREASING**	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	**DECREASING**	No Trend	n<4	n<4
Stability Test, If No Trend Exists at		n<4	**CV > 1**			n<4	n<4
80% Confidence Level		n<4	**NON-STABLE**	NA	NA	n<4	n<4

Data Entry By = EER | Date = 16-Mar-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-9	
	Compound ->	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
Event Number	Sampling Date (most recent last)						
1	23-Apr-15	27.00	3.50	0.99	6.58		
2	11-Nov-15	16.00	6.40	1.00	11.80		
3	8-Jun-16		1.30	1.30	2.60		
4	16-Nov-16		16.30	1.30	39.40		
5	16-Jun-17		1.90	1.00	2.90		
6	12-Dec-17		5.90	1.30	11.80		
7	23-May-18		33.80	0.89	57.69		
8	20-Nov-18		3.90	0.88	5.49		
9	16-Apr-19		1.50	0.85	2.35		
10	19-Nov-19		1.60	1.30	4.70		
	Mann Kendall Statistic (S) =	-1.0	-5.0	-8.0	-6.0	0.0	0.0
	Number of Rounds (n) =	2	10	10	10	0	0
	Average =	21.50	7.61	1.08	14.53	#DIV/0!	#DIV/0!
	Standard Deviation =	7.778	10.233	0.195	18.749	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.362	1.345	0.181	1.290	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4				n<4	n<4
Trend ≥ 80% Confidence Level		n<4	No Trend	No Trend	No Trend	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	No Trend	No Trend	n<4	n<4
Stability Test, If No Trend Exists at		n<4	**CV > 1**	**CV <= 1**	**CV > 1**	n<4	n<4
80% Confidence Level		n<4	**NON-STABLE**	**STABLE**	**NON-STABLE**	n<4	n<4
	Data Entry By = EER		Date = 24-Dec-19		Checked By = EER		

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Department of Natural Resources
Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-10

Event Number	Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	trans-1,2-DCE Concentration (leave blank if no data)	Tetra-CE Concentration (leave blank if no data)	Vinyl Chloride Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
	Compound ->						
1	23-Apr-15	234.00	0.65	7.10		354.00	367.55
2	11-Nov-15	52.40	1.00	6.90		380.00	396.70
3	8-Jun-16		0.64	5.60		232.00	242.94
4	30-Nov-16		1.30	5.70		306.00	415.10
5	12-Dec-17			5.30		271.00	285.00
6	23-May-18		1.30	2.70		73.00	110.51
7	20-Nov-18		2.00	4.50		212.00	222.10
8	16-Apr-19		4.10	3.00	1.40	129.00	140.10
9	19-Nov-19		0.76	4.50		214.00	221.40
10	5-Mar-20			3.80		142.00	149.00
	Mann Kendall Statistic (S) =	-1.0	13.0	-30.0	0.0	-25.0	-23.0
	Number of Rounds (n) =	2	8	10	1	10	10
	Average =	143.20	1.47	4.91	1.40	231.30	255.04
	Standard Deviation =	128.411	1.155	1.495	#DIV/0!	99.160	109.011
	Coefficient of Variation(CV)=	0.897	0.787	0.304	#DIV/0!	0.429	0.427
Error Check, Blank if No Errors Detected		n<4			n<4		
Trend ≥ 80% Confidence Level		n<4	INCREASING	DECREASING	n<4	DECREASING	DECREASING
Trend ≥ 90% Confidence Level		n<4	INCREASING	DECREASING	n<4	DECREASING	DECREASING
Stability Test, If No Trend Exists at		n<4			n<4		
80% Confidence Level		n<4	NA	NA	n<4	NA	NA

Data Entry By = EER | Date = 16-Mar-20 | Checked By = EER

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Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-10	
	Compound ->	DRO	cis-1,2-DCE	trans-1,2-DCE	Tetra-CE	Vinyl Chloride	Total VOC
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	29-Oct-14	246.00	1.90	6.10	1.30	289.00	908.10
2	23-Apr-15	234.00	0.65	7.10		354.00	367.55
3	11-Nov-15	52.40	1.00	6.90		380.00	396.70
4	8-Jun-16		0.64	5.60		232.00	242.94
5	30-Nov-16		1.30	5.70		306.00	415.10
6	12-Dec-17			5.30		271.00	285.00
7	23-May-18		1.30	2.70		73.00	110.51
8	20-Nov-18		2.00	4.50		212.00	222.10
9	16-Apr-19		4.10	3.00	1.40	129.00	140.10
10	19-Nov-19		0.76	4.50		214.00	221.40
	Mann Kendall Statistic (S) =	-3.0	9.0	-30.0	1.0	-23.0	-27.0
	Number of Rounds (n) =	3	9	10	2	10	10
	Average =	177.47	1.52	5.14	1.35	246.00	330.95
	Standard Deviation =	108.477	1.090	1.482	0.071	95.270	227.198
	Coefficient of Variation(CV)=	0.611	0.719	0.288	0.052	0.387	0.687
Error Check, Blank if No Errors Detected		n<4			n<4		
Trend ≥ 80% Confidence Level		n<4	No Trend	**DECREASING**	n<4	**DECREASING**	**DECREASING**
Trend ≥ 90% Confidence Level		n<4	No Trend	**DECREASING**	n<4	**DECREASING**	**DECREASING**
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	**CV <= 1** **STABLE**	NA	n<4 n<4	NA	NA
	Data Entry By = EER		Date = 24-Dec-19		Checked By = EER		

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-7

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	4-Nov-15	24.50	2.60	2.60			
2	6-Jun-16		2.70	2.70			
3	16-Nov-16		38.70	80.32			
4	16-Jun-17		5.50	5.50			
5	12-Dec-17		5.60	12.60			
6	23-May-18		52.70	85.90			
7	20-Nov-18		2.00	2.89			
8	16-Apr-19		1.90	1.90			
9	19-Nov-19		1.30	1.30			
10	5-Mar-20		1.30	2.60			
	Mann Kendall Statistic (S) =	0.0	-18.0	-10.0	0.0	0.0	0.0
	Number of Rounds (n) =	1	10	10	0	0	0
	Average =	24.50	11.43	19.83	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	18.425	33.534	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	1.612	1.691	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	No Trend	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	No Trend	n<4	n<4	n<4
Stability Test, If No Trend Exists at		n<4		**CV > 1**	n<4	n<4	n<4
80% Confidence Level		n<4	NA	**NON-STABLE**	n<4	n<4	n<4

Data Entry By = EER | Date = 5-Mar-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-7	
	Compound ->	DRO	1,1-DCA	Total VOC			
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	109.00	3.60	7.14			
2	4-Nov-15	24.50	2.60	2.60			
3	6-Jun-16		2.70	2.70			
4	16-Nov-16		38.70	80.32			
5	16-Jun-17		5.50	5.50			
6	12-Dec-17		5.60	12.60			
7	23-May-18		52.70	85.90			
8	20-Nov-18		2.00	2.89			
9	16-Apr-19		1.90	1.90			
10	19-Nov-19		1.30	1.30			
	Mann Kendall Statistic (S) =	-1.0	-11.0	-9.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	10	10	0	0	0
	Average =	66.75	11.66	20.29	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	59.751	18.298	33.305	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.895	1.569	1.642	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	No Trend	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	No Trend	n<4	n<4	n<4
Stability Test, If No Trend Exists at		n<4		**CV > 1**	n<4	n<4	n<4
80% Confidence Level		n<4	NA	**NON-STABLE**	n<4	n<4	n<4
	Data Entry By = EER		Date = 24-Dec-19		Checked By = EER		

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Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-9	
	Compound ->	DRO	1,1-DCA	cis-1,2-DCE	Total VOC		
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	11-Nov-15	16.00	6.40	1.00	11.80		
2	8-Jun-16		1.30	1.30	2.60		
3	16-Nov-16		16.30	1.30	39.40		
4	16-Jun-17		1.90	1.00	2.90		
5	12-Dec-17		5.90	1.30	11.80		
6	23-May-18		33.80	0.89	57.69		
7	20-Nov-18		3.90	0.88	5.49		
8	16-Apr-19		1.50	0.85	2.35		
9	19-Nov-19		1.60	1.30	4.70		
10	5-Mar-20		1.60	0.84	2.44		
	Mann Kendall Statistic (S) =	0.0	-10.0	-20.0	-12.0	0.0	0.0
	Number of Rounds (n) =	1	10	10	10	0	0
	Average =	16.00	7.42	1.07	14.12	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	10.334	0.208	18.988	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	1.393	0.196	1.345	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4				n<4	n<4
Trend ≥ 80% Confidence Level		n<4	No Trend	**DECREASING**	**DECREASING**	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	**DECREASING**	No Trend	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	**CV > 1** **NON-STABLE**	NA	NA	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 16-Mar-20		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-9

Event Number	Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
	Compound ->	DRO	1,1-DCA	cis-1,2-DCE	Total VOC		
1	23-Apr-15	27.00	3.50	0.99	6.58		
2	11-Nov-15	16.00	6.40	1.00	11.80		
3	8-Jun-16		1.30	1.30	2.60		
4	16-Nov-16		16.30	1.30	39.40		
5	16-Jun-17		1.90	1.00	2.90		
6	12-Dec-17		5.90	1.30	11.80		
7	23-May-18		33.80	0.89	57.69		
8	20-Nov-18		3.90	0.88	5.49		
9	16-Apr-19		1.50	0.85	2.35		
10	19-Nov-19		1.60	1.30	4.70		
	Mann Kendall Statistic (S) =	-1.0	-5.0	-8.0	-6.0	0.0	0.0
	Number of Rounds (n) =	2	10	10	10	0	0
	Average =	21.50	7.61	1.08	14.53	#DIV/0!	#DIV/0!
	Standard Deviation =	7.778	10.233	0.195	18.749	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.362	1.345	0.181	1.290	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4				n<4	n<4
Trend ≥ 80% Confidence Level		n<4	No Trend	No Trend	No Trend	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	No Trend	No Trend	n<4	n<4
Stability Test, If No Trend Exists at		n<4	**CV > 1**	**CV <= 1**	**CV > 1**	n<4	n<4
80% Confidence Level		n<4	**NON-STABLE**	**STABLE**	**NON-STABLE**	n<4	n<4

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

State of Wisconsin
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Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072			Well Number = MW-10
	Compound ->	DRO Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	trans-1,2-DCE Concentration (leave blank if no data)	Tetra-CE Concentration (leave blank if no data)	Vinyl Chloride Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
Event Number	Sampling Date (most recent last)						
1	23-Apr-15	234.00	0.65	7.10		354.00	367.55
2	11-Nov-15	52.40	1.00	6.90		380.00	396.70
3	8-Jun-16		0.64	5.60		232.00	242.94
4	30-Nov-16		1.30	5.70		306.00	415.10
5	12-Dec-17			5.30		271.00	285.00
6	23-May-18		1.30	2.70		73.00	110.51
7	20-Nov-18		2.00	4.50		212.00	222.10
8	16-Apr-19		4.10	3.00	1.40	129.00	140.10
9	19-Nov-19		0.76	4.50		214.00	221.40
10	5-Mar-20			3.80		142.00	149.00
	Mann Kendall Statistic (S) =	-1.0	13.0	-30.0	0.0	-25.0	-23.0
	Number of Rounds (n) =	2	8	10	1	10	10
	Average =	143.20	1.47	4.91	1.40	231.30	255.04
	Standard Deviation =	128.411	1.155	1.495	#DIV/0!	99.160	109.011
	Coefficient of Variation(CV)=	0.897	0.787	0.304	#DIV/0!	0.429	0.427
Error Check, Blank if No Errors Detected		n<4			n<4		
Trend ≥ 80% Confidence Level		n<4	INCREASING	DECREASING	n<4	DECREASING	DECREASING
Trend ≥ 90% Confidence Level		n<4	INCREASING	DECREASING	n<4	DECREASING	DECREASING
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	n<4 n<4	NA	NA
	Data Entry By = EER		Date = 16-Mar-20		Checked By = EER		

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Department of Natural Resources
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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-10

Event Number	Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	trans-1,2-DCE Concentration (leave blank if no data)	Tetra-CE Concentration (leave blank if no data)	Vinyl Chloride Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
	Compound ->						
1	29-Oct-14	246.00	1.90	6.10	1.30	289.00	908.10
2	23-Apr-15	234.00	0.65	7.10		354.00	367.55
3	11-Nov-15	52.40	1.00	6.90		380.00	396.70
4	8-Jun-16		0.64	5.60		232.00	242.94
5	30-Nov-16		1.30	5.70		306.00	415.10
6	12-Dec-17			5.30		271.00	285.00
7	23-May-18		1.30	2.70		73.00	110.51
8	20-Nov-18		2.00	4.50		212.00	222.10
9	16-Apr-19		4.10	3.00	1.40	129.00	140.10
10	19-Nov-19		0.76	4.50		214.00	221.40
	Mann Kendall Statistic (S) =	-3.0	9.0	-30.0	1.0	-23.0	-27.0
	Number of Rounds (n) =	3	9	10	2	10	10
	Average =	177.47	1.52	5.14	1.35	246.00	330.95
	Standard Deviation =	108.477	1.090	1.482	0.071	95.270	227.198
	Coefficient of Variation(CV)=	0.611	0.719	0.288	0.052	0.387	0.687
Error Check, Blank if No Errors Detected		n<4			n<4		
Trend ≥ 80% Confidence Level		n<4	No Trend	**DECREASING**	n<4	**DECREASING**	**DECREASING**
Trend ≥ 90% Confidence Level		n<4	No Trend	**DECREASING**	n<4	**DECREASING**	**DECREASING**
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	**CV <= 1** **STABLE**	NA	n<4 n<4	NA	NA

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-11

	Compound ->	DRO	cis-1,2-DCE	trans-1,2-DCE	Tetra-CE	TCE	Total VOC
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	21-Jul-15	8.90	209.00	9.40	4.40	6.90	429.30
2	20-Jan-16	0.71	212.00	10.40	6.70	9.40	239.24
3	21-Sep-16		193.00	15.40	4.30	8.50	221.30
4	2-Mar-17		216.00	14.80	3.60	7.50	243.00
5	25-Jul-17		168.00	7.90	3.00	6.10	337.88
6	22-Feb-18		181.00	9.60	7.20	8.00	206.75
7	28-Aug-18		161.00	8.10			172.18
8	19-Feb-19		178.00	13.60	4.90	6.40	202.90
9	30-Jul-19		143.00	7.60	2.80	4.80	209.00
10	11-Jun-20		133.00	7.20	2.70	4.90	147.80
	Mann Kendall Statistic (S) =	-1.0	-31.0	-19.0	-16.0	-20.0	-27.0
	Number of Rounds (n) =	2	10	10	9	9	10
	Average =	4.81	179.40	10.40	4.40	6.94	240.94
	Standard Deviation =	5.791	28.702	3.089	1.637	1.568	83.206
	Coefficient of Variation(CV)=	1.205	0.160	0.297	0.372	0.226	0.345
Error Check, Blank if No Errors Detected		n<4					
Trend ≥ 80% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	DECREASING
Trend ≥ 90% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	DECREASING
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	NA	NA	NA

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-11	
	Compound ->	DRO Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	trans-1,2-DCE Concentration (leave blank if no data)	Tetra-CE Concentration (leave blank if no data)	TCE Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
Event Number	Sampling Date (most recent last)						
1	21-Jan-15	0.34	230.00	17.00	6.90	8.90	265.38
2	21-Jul-15	8.90	209.00	9.40	4.40	6.90	429.30
3	20-Jan-16	0.71	212.00	10.40	6.70	9.40	239.24
4	21-Sep-16		193.00	15.40	4.30	8.50	221.30
5	2-Mar-17		216.00	14.80	3.60	7.50	243.00
6	25-Jul-17		168.00	7.90	3.00	6.10	337.88
7	22-Feb-18		181.00	9.60	7.20	8.00	206.75
8	28-Aug-18		161.00	8.10			172.18
9	19-Feb-19		178.00	13.60	4.90	6.40	202.90
10	30-Jul-19		143.00	7.60	2.80	4.80	209.00
	Mann Kendall Statistic (S) =	1.0	-31.0	-19.0	-14.0	-20.0	-23.0
	Number of Rounds (n) =	3	10	10	9	9	10
	Average =	3.32	189.10	11.38	4.87	7.39	252.69
	Standard Deviation =	4.839	27.650	3.489	1.690	1.480	76.630
	Coefficient of Variation(CV)=	1.459	0.146	0.307	0.347	0.200	0.303
Error Check, Blank if No Errors Detected		n<4					
Trend ≥ 80% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	DECREASING
Trend ≥ 90% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	DECREASING
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	NA	NA	NA
	Data Entry By = EER		Date = 13-Aug-19		Checked By = EER		

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-12	
	Compound ->						
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	30-Jul-19						
2							
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	0.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	0	0	0	0	0	0
	Average =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 13-Aug-19		Checked By = EER		

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Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-12	
	Compound ->						
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	30-Jul-19						
2							
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	0.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	0	0	0	0	0	0
	Average =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 13-Aug-19		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name = Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-13	
	Compound ->	Total VOC Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Event Number	Sampling Date (most recent last)	(leave blank if no data)	(leave blank if no data)	(leave blank if no data)	(leave blank if no data)	(leave blank if no data)	(leave blank if no data)
1	30-Jul-19	3.29					
2	11-Jun-20						
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	0.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	1	0	0	0	0	0
	Average =	3.29	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 6-Jul-20		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-14

	Compound ->	DRO	1,1-DCA	1,1-DCE	1,1,1-TCA	Total VOC	VC
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	26-Sep-14	1.50	60.10	7.80	87.80	165.91	1.20
2	28-Jan-15	0.45	33.40	3.80	55.80	99.68	0.28
3	27-Jul-15	0.49	57.80	6.40	82.90	157.51	1.00
4	14-Mar-16		40.70	5.80	85.20	142.59	0.89
5	21-Sep-16		46.30	3.60	45.70	103.56	0.56
6	22-Mar-17		43.50	6.30	83.90	145.60	0.20
7	25-Jul-17		48.20	5.40	73.60	140.48	0.99
8	22-Feb-18		35.60	5.30	67.70	121.16	0.59
9	20-Nov-18		5.00		68.30	95.10	1.20
10	11-Jun-20		26.90	3.20	41.10	62.50	0.80
	Mann Kendall Statistic (S) =	-1.0	-21.0	-18.0	-19.0	-25.0	-2.0
	Number of Rounds (n) =	3	10	9	10	10	10
	Average =	0.81	39.75	5.29	69.20	123.41	0.77
	Standard Deviation =	0.595	15.984	1.511	16.831	32.650	0.354
	Coefficient of Variation(CV)=	0.732	0.402	0.286	0.243	0.265	0.459
Error Check, Blank if No Errors Detected		n<4					
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	**DECREASING**	**DECREASING**	**DECREASING**	No Trend
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	**DECREASING**	**DECREASING**	**DECREASING**	No Trend
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	NA	NA	**CV <= 1** **STABLE**

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-14

Event Number	Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	1,1-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	VC Concentration (leave blank if no data)
Compound ->							
1	26-Sep-14	1.50	60.10	7.80	87.80	165.91	1.20
2	28-Jan-15	0.45	33.40	3.80	55.80	99.68	0.28
3	27-Jul-15	0.49	57.80	6.40	82.90	157.51	1.00
4	14-Mar-16		40.70	5.80	85.20	142.59	0.89
5	21-Sep-16		46.30	3.60	45.70	103.56	0.56
6	22-Mar-17		43.50	6.30	83.90	145.60	0.20
7	25-Jul-17		48.20	5.40	73.60	140.48	0.99
8	22-Feb-18		35.60	5.30	67.70	121.16	0.59
9	20-Nov-18		5.00		68.30	95.10	1.20
10	19-Oct-19		7.10			7.10	
	Mann Kendall Statistic (S) =	-1.0	-21.0	-10.0	-10.0	-25.0	-1.0
	Number of Rounds (n) =	3	10	8	9	10	9
	Average =	0.81	37.77	5.55	72.32	117.87	0.77
	Standard Deviation =	0.595	18.741	1.382	14.458	46.074	0.375
	Coefficient of Variation(CV)=	0.732	0.496	0.249	0.200	0.391	0.489
Error Check, Blank if No Errors Detected		n<4					
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	**DECREASING**	**DECREASING**	**DECREASING**	No Trend
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	No Trend	No Trend	**DECREASING**	No Trend
Stability Test, If No Trend Exists at		n<4					**CV <= 1**
80% Confidence Level		n<4	NA	NA	NA	NA	**STABLE**

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-15

	Compound ->						
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	30-Jul-19						
2	11-Jun-20						
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	0.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	0	0	0	0	0	0
	Average =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

State of Wisconsin
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Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3			BRRTS No. = 02-52-000072		Well Number = MW-15	
	Compound ->					
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	30-Jul-19						
2							
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	0.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	0	0	0	0	0	0
	Average =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 13-Aug-19		Checked By = EER		

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-17

	Compound ->	DRO	1,1-DCA	Total VOC			
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	0.87	1.60	1.60			
2	11-Nov-15	4.50	2.80	6.97			
3	8-Jun-16		0.42	0.42			
4	16-Nov-16		9.70	25.50			
5	16-Jun-17		0.39	0.39			
6	12-Dec-17		0.28	0.29			
7	23-May-18						
8	20-Nov-18		0.39	1.28			
9	16-Apr-19		0.43	0.43			
10	11-Jun-20		0.29	0.29			
	Mann Kendall Statistic (S) =	1.0	-15.0	-15.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	9	9	0	0	0
	Average =	2.69	1.81	4.13	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	2.567	3.078	8.293	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.956	1.700	2.008	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	**DECREASING**	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	**DECREASING**	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-17
	Compound ->	DRO	1,1-DCA	Total VOC			
		Concentration	Concentration	Concentration	Concentration	Concentration	Concentration
Event	Sampling Date	(leave blank	(leave blank	(leave blank	(leave blank	(leave blank	(leave blank
Number	(most recent last)	if no data)	if no data)	if no data)	if no data)	if no data)	if no data)
1	23-Apr-15	0.87	1.60	1.60			
2	11-Nov-15	4.50	2.80	6.97			
3	8-Jun-16		0.42	0.42			
4	16-Nov-16		9.70	25.50			
5	16-Jun-17		0.39	0.39			
6	12-Dec-17		0.28	0.29			
7	23-May-18						
8	20-Nov-18		0.39	1.28			
9	16-Apr-19		0.43	0.43			
10	19-Nov-19						
	Mann Kendall Statistic (S) =	1.0	-9.0	-8.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	8	8	0	0	0
	Average =	2.69	2.00	4.61	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	2.567	3.234	8.731	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.956	1.616	1.894	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4			n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	**DECREASING**	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	No Trend	n<4	n<4	n<4
Stability Test, If No Trend Exists at		n<4			n<4	n<4	n<4
80% Confidence Level		n<4	NA	NA	n<4	n<4	n<4
	Data Entry By = EER		Date = 24-Dec-19		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-19

	Compound ->	1,1-DCA					
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	21-Jan-15	0.94					
2	21-Jul-15	4.90					
3	20-Jan-16	0.54					
4	21-Sep-16	0.54					
5	2-Mar-17	1.10					
6	25-Jul-17	0.55					
7	28-Aug-18						
8	16-Apr-19						
9	30-Jul-19	2.60					
10	11-Aug-20	0.42					
	Mann Kendall Statistic (S) =	-5.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	8	0	0	0	0	0
	Average =	1.45	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	1.565	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	1.080	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected			n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		No Trend	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		No Trend	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		**CV > 1 NON-STABLE**	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-19	
	Compound ->	1,1-DCA					
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	26-Aug-14	8.70					
2	21-Jan-15	0.94					
3	21-Jul-15	4.90					
4	20-Jan-16	0.54					
5	21-Sep-16	0.54					
6	2-Mar-17	1.10					
7	25-Jul-17	0.55					
8	28-Aug-18						
9	16-Apr-19						
10	30-Jul-19	2.60					
	Mann Kendall Statistic (S) =	-5.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	8	0	0	0	0	0
	Average =	2.48	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	2.930	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	1.180	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected			n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		No Trend	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		No Trend	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		**CV > 1 NON-STABLE**	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 13-Aug-19		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

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Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-21

	Compound ->	DRO					
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	15-Sep-10	840.00					
2	31-Jan-11	7.51					
3	31-Oct-11	18,000.00					
4	28-Apr-12	446,000.00					
5	18-May-13	69,500.00					
6	4-Jun-14	9,090.00					
7	27-Apr-15	582.00					
8	11-May-16						
9	16-Apr-19						
10	19-Nov-19						
	Mann Kendall Statistic (S) =	1.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	7	0	0	0	0	0
	Average =	77717.07	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	164253.015	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	2.113	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected			n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		No Trend	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		No Trend	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at		**CV > 1**	n<4	n<4	n<4	n<4	n<4
80% Confidence Level		**NON-STABLE**	n<4	n<4	n<4	n<4	n<4

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-22

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	305.00	11.40				
2	11-Nov-15	9.80	2.97				
3	15-Jun-16		0.95				
4	16-Nov-16		37.00				
5	16-Jun-17						
6	12-Dec-17		4.10				
7	23-May-18		29.16				
8	20-Nov-18		2.10				
9	16-Apr-19		0.69				
10	11-Jun-20		0.39				
	Mann Kendall Statistic (S) =	-1.0	-16.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	9	0	0	0	0
	Average =	157.40	9.86	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	208.738	13.718	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	1.326	1.391	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4		n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	**DECREASING**	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-22

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	305.00	11.40				
2	11-Nov-15	9.80	2.97				
3	15-Jun-16		0.95				
4	16-Nov-16		37.00				
5	16-Jun-17						
6	12-Dec-17		4.10				
7	23-May-18		29.16				
8	20-Nov-18		2.10				
9	16-Apr-19		0.69				
10	19-Nov-19						
	Mann Kendall Statistic (S) =	-1.0	-8.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	8	0	0	0	0
	Average =	157.40	11.05	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	208.738	14.165	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	1.326	1.282	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4		n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	**DECREASING**	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-23

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	0.35	0.76				
2	14-Oct-15	0.07	17.54				
3	15-Jun-16		0.50				
4	16-Nov-16		46.40				
5	16-Jun-17						
6	12-Dec-17		9.30				
7	23-May-18		56.30				
8	20-Nov-18		3.90				
9	16-Apr-19		3.44				
10	11-Jun-20		0.68				
	Mann Kendall Statistic (S) =	-1.0	-4.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	9	0	0	0	0
	Average =	0.21	15.42	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	0.199	21.225	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.948	1.376	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4		n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	No Trend	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	**CV > 1** **NON-STABLE**	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-23

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	23-Apr-15	0.35	0.76				
2	14-Oct-15	0.07	17.54				
3	15-Jun-16		0.50				
4	16-Nov-16		46.40				
5	16-Jun-17						
6	12-Dec-17		9.30				
7	23-May-18		56.30				
8	20-Nov-18		3.90				
9	16-Apr-19		3.44				
10	19-Nov-19						
	Mann Kendall Statistic (S) =	-1.0	2.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	8	0	0	0	0
	Average =	0.21	17.27	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	0.199	21.907	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.948	1.269	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4		n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	No Trend	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	No Trend	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	**CV > 1** **NON-STABLE**	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

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Site Name = Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-24	
	Compound ->	DRO Concentration (leave blank if no data)	Chloroethane Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)
Event Number	Sampling Date (most recent last)						
1	24-Oct-14	1.40	111.00	704.00	364.00	1,242.12	
2	27-Apr-15	0.45	46.40	268.00	40.60	368.60	
3	14-Oct-15	0.48	53.60	353.00	53.60	477.60	
4	15-Jun-16		47.60	1.80	36.80	387.90	
5	30-Nov-16		32.20	363.00	55.40	460.40	
6	16-Jun-17		38.40	292.00	41.30	385.00	
7	23-May-18		16.30	217.00	30.60	272.37	
8	20-Nov-18		9.70	309.00	43.50	363.77	
9	16-Apr-19		9.20	271.00	29.00	314.50	
10	11-Jun-20			251.00	32.90	292.40	
	Mann Kendall Statistic (S) =	-1.0	-30.0	-13.0	-21.0	-29.0	0.0
	Number of Rounds (n) =	3	9	10	10	10	0
	Average =	0.78	40.49	302.98	72.77	456.47	#DIV/0!
	Standard Deviation =	0.540	31.254	173.246	102.710	283.784	#DIV/0!
	Coefficient of Variation(CV)=	0.695	0.772	0.572	1.411	0.622	#DIV/0!
Error Check, Blank if No Errors Detected		n<4					n<4
Trend ≥ 80% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	n<4
Trend ≥ 90% Confidence Level		n<4	DECREASING	No Trend	DECREASING	DECREASING	n<4
Stability Test, If No Trend Exists at		n<4					n<4
80% Confidence Level		n<4	NA	NA	NA	NA	n<4
	Data Entry By = EER		Date = 6-Jul-20		Checked By = EER		

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-24

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	Chloroethane Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	24-Oct-14	1.40	111.00	704.00	364.00	1,242.12	
2	27-Apr-15	0.45	46.40	268.00	40.60	368.60	
3	14-Oct-15	0.48	53.60	353.00	53.60	477.60	
4	15-Jun-16		47.60	1.80	36.80	387.90	
5	30-Nov-16		32.20	363.00	55.40	460.40	
6	16-Jun-17		38.40	292.00	41.30	385.00	
7	23-May-18		16.30	217.00	30.60	272.37	
8	20-Nov-18		9.70	309.00	43.50	363.77	
9	16-Apr-19		9.20	271.00	29.00	314.50	
10	19-Nov-19			0.48		1.12	
	Mann Kendall Statistic (S) =	-1.0	-30.0	-17.0	-16.0	-31.0	0.0
	Number of Rounds (n) =	3	9	10	9	10	0
	Average =	0.78	40.49	277.93	77.20	427.34	#DIV/0!
	Standard Deviation =	0.540	31.254	197.950	107.922	315.654	#DIV/0!
	Coefficient of Variation(CV)=	0.695	0.772	0.712	1.398	0.739	#DIV/0!
Error Check, Blank if No Errors Detected		n<4					n<4
Trend ≥ 80% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	n<4
Trend ≥ 90% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	n<4
Stability Test, If No Trend Exists at		n<4					n<4
80% Confidence Level		n<4	NA	NA	NA	NA	n<4

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

Mann-Kendall Statistical Test
Form 4400-215 (2/2001)

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-25

Event Number	Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	trans-1,2-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
	Compound ->	DRO	1,1-DCA	cis-1,2-DCE	trans-1,2-DCE	1,1,1-TCA	Total VOC
1	14-Oct-15	0.21	111.00	5.70	0.82	6.10	127.30
2	15-Jun-16		122.00	5.90	0.75	7.00	139.31
3	16-Nov-16		129.00	4.10	0.79	60.80	205.09
4	16-Jun-17		122.00	4.80	0.63	6.30	136.62
5	12-Dec-17		98.90	3.80	0.62	14.00	119.40
6	23-May-18		151.00	4.20	0.66	49.70	220.21
7	20-Nov-18		73.80	2.50		4.60	81.53
8	16-Apr-19		126.00	4.40		5.20	137.25
9	19-Oct-19		104.00	3.60		3.50	112.39
10	5-Mar-20		68.90	1.80		1.30	72.44
	Mann Kendall Statistic (S) =	0.0	-12.0	-27.0	-9.0	-21.0	-17.0
	Number of Rounds (n) =	1	10	10	6	10	10
	Average =	0.21	110.66	4.08	0.71	15.85	135.15
	Standard Deviation =	#DIV/0!	25.258	1.273	0.086	21.183	46.888
	Coefficient of Variation(CV)=	#DIV/0!	0.228	0.312	0.121	1.336	0.347
Error Check, Blank if No Errors Detected		n<4					
Trend ≥ 80% Confidence Level		n<4	DECREASING	DECREASING	DECREASING	DECREASING	DECREASING
Trend ≥ 90% Confidence Level		n<4	No Trend	DECREASING	DECREASING	DECREASING	DECREASING
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	NA	NA	NA	NA	NA

Data Entry By = EER | Date = 16-Mar-20 | Checked By = EER

State of Wisconsin
Department of Natural Resources
Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-25

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	trans-1,2-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
1	23-Apr-15	0.52	140.00	5.90	0.85	6.90	156.60
2	14-Oct-15	0.21	111.00	5.70	0.82	6.10	127.30
3	15-Jun-16		122.00	5.90	0.75	7.00	139.31
4	16-Nov-16		129.00	4.10	0.79	60.80	205.09
5	16-Jun-17		122.00	4.80	0.63	6.30	136.62
6	12-Dec-17		98.90	3.80	0.62	14.00	119.40
7	23-May-18		151.00	4.20	0.66	49.70	220.21
8	20-Nov-18		73.80	2.50		4.60	81.53
9	16-Apr-19		126.00	4.40		5.20	137.25
10	19-Oct-19		104.00	3.60		3.50	112.39
	Mann Kendall Statistic (S) =	-1.0	-10.0	-26.0	-15.0	-13.0	-13.0
	Number of Rounds (n) =	2	10	10	7	10	10
	Average =	0.37	117.77	4.49	0.73	16.41	143.57
	Standard Deviation =	0.219	21.992	1.106	0.094	20.827	41.639
	Coefficient of Variation(CV)=	0.601	0.187	0.246	0.129	1.269	0.290
Error Check, Blank if No Errors Detected		n<4					
Trend ≥ 80% Confidence Level		n<4	No Trend	**DECREASING**	**DECREASING**	**DECREASING**	**DECREASING**
Trend ≥ 90% Confidence Level		n<4	No Trend	**DECREASING**	**DECREASING**	No Trend	No Trend
Stability Test, If No Trend Exists at		n<4	**CV <= 1**				
80% Confidence Level		n<4	**STABLE**	NA	NA	NA	NA

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

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Mann-Kendall Statistical Test
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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-25

Event Number	Compound -> Sampling Date (most recent last)	DRO Concentration (leave blank if no data)	1,1-DCA Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	trans-1,2-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)
1	23-Apr-15	0.52	140.00	5.90	0.85	6.90	156.60
2	14-Oct-15	0.21	111.00	5.70	0.82	6.10	127.30
3	15-Jun-16		122.00	5.90	0.75	7.00	139.31
4	16-Nov-16		129.00	4.10	0.79	60.80	205.09
5	16-Jun-17		122.00	4.80	0.63	6.30	136.62
6	12-Dec-17		98.90	3.80	0.62	14.00	119.40
7	23-May-18		151.00	4.20	0.66	49.70	220.21
8	20-Nov-18		73.80	2.50		4.60	81.53
9	16-Apr-19		126.00	4.40		5.20	137.25
10	19-Oct-19		104.00	3.60		3.50	112.39
	Mann Kendall Statistic (S) =	-1.0	-10.0	-26.0	-15.0	-13.0	-13.0
	Number of Rounds (n) =	2	10	10	7	10	10
	Average =	0.37	117.77	4.49	0.73	16.41	143.57
	Standard Deviation =	0.219	21.992	1.106	0.094	20.827	41.639
	Coefficient of Variation(CV)=	0.601	0.187	0.246	0.129	1.269	0.290
Error Check, Blank if No Errors Detected		n<4					
Trend ≥ 80% Confidence Level		n<4	No Trend	**DECREASING**	**DECREASING**	**DECREASING**	**DECREASING**
Trend ≥ 90% Confidence Level		n<4	No Trend	**DECREASING**	**DECREASING**	No Trend	No Trend
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	**CV <= 1** **STABLE**	NA	NA	NA	NA

Data Entry By = EER | Date = 24-Dec-19 | Checked By = EER

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-26

	Compound ->	1,1-DCA Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
Event Number	Sampling Date (most recent last)						
1	30-Jul-19	0.74	0.87	0.31	1.92		
2	11-Jun-20	2.40			6.00		
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	1.0	0.0	0.0	1.0	0.0	0.0
	Number of Rounds (n) =	2	1	1	2	0	0
	Average =	1.57	0.87	0.31	3.96	#DIV/0!	#DIV/0!
	Standard Deviation =	1.174	#DIV/0!	#DIV/0!	2.885	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.748	#DIV/0!	#DIV/0!	0.729	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at		n<4	n<4	n<4	n<4	n<4	n<4
80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

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Department of Natural Resources
Remediation and Redevelopment Program

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Site Name : Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-26

	Compound ->	1,1-DCA Concentration (leave blank if no data)	cis-1,2-DCE Concentration (leave blank if no data)	1,1,1-TCA Concentration (leave blank if no data)	Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
Event Number	Sampling Date (most recent last)						
1	30-Jul-19	0.74	0.87	0.31	1.92		
2							
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	0.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	1	1	1	1	0	0
	Average =	0.74	0.87	0.31	1.92	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4

Data Entry By = EER | Date = 13-Aug-19 | Checked By = EER

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Remediation and Redevelopment Program

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Site Name = Twin Disc Plant 3 | BRRTS No. = 02-52-000072 | Well Number = MW-402N

Event Number	Sampling Date (most recent last)	Compound -> Total VOC Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	30-Jul-19	0.31					
2	11-Jun-20	0.44					
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	1.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	2	0	0	0	0	0
	Average =	0.38	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	0.092	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	0.245	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at		n<4	n<4	n<4	n<4	n<4	n<4
80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4

Data Entry By = EER | Date = 6-Jul-20 | Checked By = EER

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Form 4400-215 (2/2001)

Notice: This form is the DNR supplied spreadsheet referenced in Appendices A of Comm 46 and NR 746, Wis. Adm. Code. It is provided to consultants as an optional tool for groundwater contaminant trend analysis to support site closure requests under s. Comm 46.07, Comm 46.08, NR 746.07, NR 746.08, Wis. Adm. Code. Use this form or a manual method when seeking case closure under those rules. Earlier versions of this form should not be used.

Instructions: Do not change formulas or other information in cells with a blue background, only cells with a yellow background are used for data entry. To use the spreadsheet, provide at least four rounds and not more than ten rounds of data that is not seasonally affected. Use consistent units. The spreadsheet contains several error checks, and a data entry error may cause "DATA ERR" or "DATE ERR" to be displayed. Dates that are not consecutive will show an error message and will not display the test results. The spreadsheet tests the data for both increasing and decreasing trends at both 80 percent and 90 percent confidence levels. If a declining trend is present at 80 percent but not at 90 percent, a site is still eligible for closure under Comm 46 and NR 746 provided that other conditions in those rules are met. If an increasing or decreasing trend is not present, an additional coefficient of variation test is used to test for stability, as proposed by Wiedemeier et al, 1999. For additional information, refer to the Interim Guidance on Natural Attenuation for Petroleum Releases, dated October 1999. Refer to the guidance for recommendations on data entry for non-detect values.

Site Name : Twin Disc Plant 3				BRRTS No. = 02-52-000072		Well Number = MW-402N	
	Compound ->						
Event Number	Sampling Date (most recent last)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)	Concentration (leave blank if no data)
1	30-Jul-19						
2							
3							
4							
5							
6							
7							
8							
9							
10							
	Mann Kendall Statistic (S) =	0.0	0.0	0.0	0.0	0.0	0.0
	Number of Rounds (n) =	0	0	0	0	0	0
	Average =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Standard Deviation =	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
	Coefficient of Variation(CV)=	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Error Check, Blank if No Errors Detected		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 80% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Trend ≥ 90% Confidence Level		n<4	n<4	n<4	n<4	n<4	n<4
Stability Test, If No Trend Exists at 80% Confidence Level		n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4	n<4 n<4
	Data Entry By = EER		Date = 13-Aug-19		Checked By = EER		

APPENDIX IV: Vapor Intrusion Results

MW-11

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
74-87-3	Choromethane	<MDL			
75-34-3	Dichloroethane, 1,1-	<MDL			
75-35-4	Dichloroethylene, 1,1-	<MDL			
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
127-18-4	Tetrachloroethylene	2.70E+00	1.95E+00	4.10E-08	1.10E-02
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	4.90E+00	1.97E+00	6.60E-07	2.30E-01
75-01-4	Vinyl Chloride	<MDL			

Highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

All GW concentration values are in units of ug/l

MW-13

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	<MDL			
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

Highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

All GW concentration values are in units of ug/l

MW-14

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	3.00E+01	6.80E+00	8.90E-07	No RfC
75-35-4	Dichloroethylene, 1,1-	3.20E+00	3.41E+00	No IUR	3.90E-03
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	4.10E+01	2.89E+01	No IUR	1.30E-03
79-01-6	Trichloroethylene	9.20E+00	3.70E+00	1.20E-06	4.20E-01
75-01-4	Vinyl Chloride	8.00E-01	9.09E-01	3.30E-07	2.10E-03

All GW concentration values are in units of ug/l

Highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

MW-15

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	<MDL			
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

MW-16

Removed from service - 2nd quarter 2019

MW-17

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	2.90E-01	6.66E-02	8.70E-09	No RfC
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

MW-19

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	4.20E-01	9.65E-02	1.30E-08	No RfC
107-06-2	Dichloroethane, 1,2-	<MDL			
75-35-4	Dichloroethylene, 1,1-	<MDL			
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
108-88-3	Toluene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

Highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

All GW concentration values are in units of ug/l

MW-22

		Site GW Concentration	Calculated Indoor Air Concentration	VI Carcinogenic Risk	VI Hazard

CAS	Chemical Name	(ug/l) 6/11/2020	(ug/m^3) 6/11/2020	CR 6/11/2020	HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	3.90E-01	8.98E-02	1.20E-08	no RfC
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

MW-23

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	6.80E-01	1.56E-01	2.00E-08	no RfC
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

MW-24

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	2.50E+02	5.77E+01	7.50E-06	No RfC
107-06-2	Dichloroethane, 1,2-	1.30E+00	6.27E-02	1.30E-07	2.00E-03
75-35-4	Dichloroethylene, 1,1-	1.70E+00	1.81E+00	No IUR	2.10E-03
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
108-88-3	Toluene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	3.30E+01	2.31E+01	No IUR	1.10E-03
79-01-6	Trichloroethylene	5.50E+00	2.21E+00	7.40E-07	2.50E-01
75-01-4	Vinyl Chloride	<MDL			

Highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

All GW concentration values are in units of ug/l

MW-26

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
95-50-1	Dichlorobenzene, 1,2-	<MDL			
75-34-3	Dichloroethane, 1,1-	2.40E+00	5.51E-01	7.20E-08	No RfC
107-06-2	Dichloroethane, 1,2-	<MDL			

75-35-4	Dichloroethylene, 1,1-	<MDL			
75-00-3	Ethyl Chloride (Chloroethane)	3.60E+00	1.63E+00	No IUR	3.70E-05
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
108-88-3	Toluene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

Highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

MW-402N

CAS	Chemical Name	Site GW Concentration (ug/l) 6/11/2020	Calculated Indoor Air Concentration (ug/m^3) 6/11/2020	VI Carcinogenic Risk CR 6/11/2020	VI Hazard HQ 6/11/2020
75-34-3	Dichloroethane, 1,1-	4.40E-01	1.01E-01	1.30E-08	No RfC
107-06-2	Dichloroethane, 1,2-	<MDL			
75-35-4	Dichloroethylene, 1,1-	<MDL			
75-00-3	Ethyl Chloride (Chloroethane)	<MDL			
75-09-2	Methylene Chloride	<MDL			
127-18-4	Tetrachloroethylene	<MDL			
108-88-3	Toluene	<MDL			
71-55-6	Trichloroethane, 1,1,1-	<MDL			
79-01-6	Trichloroethylene	<MDL			
75-01-4	Vinyl Chloride	<MDL			

Highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

All GW concentration values are in units of ug/l

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-11 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		–	–	–	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		–	–	–			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		–	–	–			2.00E-03	X	
	75-05-8	Acetonitrile		–	–	–			6.00E-02	I	
	107-02-8	Acrolein		–	–	–			2.00E-05	I	
	79-10-7	Acrylic Acid		–	–	–			1.00E-03	I	
	107-13-1	Acrylonitrile		–	–	–	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		–	–	–	4.90E-03	I			
	107-18-6	Allyl Alcohol		–	–	–			1.00E-04	X	
	107-05-1	Allyl Chloride		–	–	–	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		–	–	–			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		–	–	–			3.00E-03	X	
	12674-11-2	Aroclor 1016		–	–	–	2.00E-05	S			
	11104-28-2	Aroclor 1221		–	–	–	5.70E-04	S			
	11141-16-5	Aroclor 1232		–	–	–	5.70E-04	S			
	53469-21-9	Aroclor 1242		–	–	–	5.70E-04	S			
	12672-29-6	Aroclor 1248		–	–	–	5.70E-04	S			
	11097-69-1	Aroclor 1254		–	–	–	5.70E-04	S			
	11096-82-5	Aroclor 1260		–	–	–	5.70E-04	S			
x	103-33-3	Azobenzene		–	–	–	3.10E-05	I			
	56-55-3	Benz[a]anthracene		–	–	–	1.10E-04	CA			Mut
	71-43-2	Benzene		–	–	–	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		–	–	–	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		–	–	–			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		–	–	–	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		–	–	–	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		–	–	–	6.20E-02	I			
	10294-34-5	Boron Trichloride		–	–	–			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	–	–			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		–	–	–	6.00E-04	X			
	108-86-1	Bromobenzene		–	–	–			6.00E-02	I	
	74-97-5	Bromochloromethane		–	–	–			4.00E-02	X	
	75-27-4	Bromodichloromethane		–	–	–	3.70E-05	CA			
	75-25-2	Bromoform		–	–	–	1.10E-06	I			
	74-83-9	Bromomethane		–	–	–			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		–	–	–	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		–	–	–			3.00E+01	P	
	75-15-0	Carbon Disulfide		–	–	–			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		–	–	–	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		–	–	–	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		–	–	–			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		–	–	–			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		–	–	–			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		–	–	–	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		–	–	–			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		–	–	–			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		–	–	–			5.00E+01	I	
	67-66-3	Chloroform		–	–	–	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		–	–	–			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		–	–	–	6.90E-04	CA			
	76-06-2	Chloropicrin		–	–	–			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		–	–	–	6.20E-04	I			Mut
	98-82-8	Cumene		–	–	–			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		–	–	–			8.00E-04	S	
	110-82-7	Cyclohexane		–	–	–			6.00E+00	I	
	108-94-1	Cyclohexanone		–	–	–			7.00E-01	P	
	110-83-8	Cyclohexene		–	–	–			1.00E+00	X	
	72-55-9	DDE, p,p'-		–	–	–	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		–	–	–	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		–	–	–	2.70E-05	CA			

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-11 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-		--	--	--	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene	2.7E+00	1.95E+00	4.1E-08	1.1E-02	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene	4.9E+00	1.97E+00	6.6E-07	2.3E-01	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($(ug/m^3)^{-1}$)	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator
95-47-6	Xylene, o-		--	--	--			1.00E-01	S	
106-42-3	Xylene, P-		--	--	--			1.00E-01	S	
1330-20-7	Xylenes		--	--	--			1.00E-01	I	
140-88-5	Ethyl Acrylate		--	--	--			8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Trichloroethylene						
	mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
	IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($(ug/m^3)^{-1}$)	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-13 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-13 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-		--	--	--	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-13 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene		--	--	--	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
95-47-6	Xylene, o-		--	--	--			1.00E-01	S	
106-42-3	Xylene, P-		--	--	--			1.00E-01	S	
1330-20-7	Xylenes		--	--	--			1.00E-01	I	
140-88-5	Ethyl Acrylate		--	--	--			8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($ug/m^3)^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-	3.0E+01	6.80E+00	8.9E-07	No RfC	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-	3.2E+00	3.41E+00	No IUR	3.9E-03			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

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Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-	4.1E+01	2.89E+01	No IUR	1.3E-03			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene	9.2E+00	3.70E+00	**1.2E-06**	4.2E-01	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride	8.0E-01	9.09E-01	3.3E-07	2.1E-03	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

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Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator I
95-47-6	Xylene, o-		--	--	--			1.00E-01	S	
106-42-3	Xylene, P-		--	--	--			1.00E-01	S	
1330-20-7	Xylenes		--	--	--			1.00E-01	I	
140-88-5	Ethyl Acrylate		--	--	--			8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**

Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
	mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
	IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-14 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($ug/m^3)^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-15 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-15 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-		--	--	--	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-15 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene		--	--	--	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-15 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator
95-47-6	Xylene, o-		--	--	--			1.00E-01	S	
106-42-3	Xylene, P-		--	--	--			1.00E-01	S	
1330-20-7	Xylenes		--	--	--			1.00E-01	I	
140-88-5	Ethyl Acrylate		--	--	--			8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
	mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
	IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

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Parameter	Symbol	Value	Instructions
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Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-17 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
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	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-	2.9E-01	6.66E-02	8.7E-09	No RfC	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

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109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene		--	--	--	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
95-47-6	Xylene, o-		--	--	--
106-42-3	Xylene, P-		--	--	--
1330-20-7	Xylenes		--	--	--
140-88-5	Ethyl Acrylate		--	--	--

Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	
		8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($(ug/m^3)^{-1}$)	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-22 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

OSWER VAPOR INTRUSION ASSESSMENT
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-	3.9E-01	8.96E-02	1.2E-08	No RfC	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene		--	--	--	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
95-47-6	Xylene, o-		–	–	–
106-42-3	Xylene, P-		–	–	–
1330-20-7	Xylenes		–	–	–
140-88-5	Ethyl Acrylate		–	–	–

Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	
		8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
mIURTCE	R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
IURTCE	R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

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Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($ug/m^3)^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-	6.8E-01	1.56E-01	2.0E-08	No RfC	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene		--	--	--	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
95-47-6	Xylene, o-		--	--	--			1.00E-01	S	
106-42-3	Xylene, P-		--	--	--			1.00E-01	S	
1330-20-7	Xylenes		--	--	--			1.00E-01	I	
140-88-5	Ethyl Acrylate		--	--	--			8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**

Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($ug/m^3)^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

OSWER VAPOR INTRUSION ASSESSMENT
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-	2.5E+02	5.77E+01	7.5E-06	No RfC	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-	1.3E+00	6.27E-02	1.3E-07	2.0E-03	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-	1.7E+00	1.81E+00	No IUR	2.1E-03			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

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Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ
109-86-4	Methoxyethanol, 2-		--	--	--
96-33-3	Methyl Acrylate		--	--	--
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--
60-34-4	Methyl Hydrazine		--	--	--
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--
624-83-9	Methyl Isocyanate		--	--	--
80-62-6	Methyl Methacrylate		--	--	--
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--
75-09-2	Methylene Chloride		--	--	--
2385-85-5	Mirex		--	--	--
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--
91-20-3	Naphthalene		--	--	--
13463-39-3	Nickel Carbonyl		No HLC	--	--
98-95-3	Nitrobenzene		--	--	--
75-52-5	Nitromethane		--	--	--
79-46-9	Nitropropane, 2-		--	--	--
62-75-9	Nitrosodimethylamine, N-		--	--	--
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--
10595-95-6	Nitrosomethylethylamine, N-		--	--	--
111-84-2	Nonane, n-		--	--	--
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--
109-66-0	Pentane, n-		--	--	--
75-44-5	Phosgene		--	--	--
7803-51-2	Phosphine		--	--	--
123-38-6	Propionaldehyde		--	--	--
103-65-1	Propyl benzene		--	--	--
115-07-1	Propylene		--	--	--
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--
75-56-9	Propylene Oxide		--	--	--
100-42-5	Styrene		--	--	--
7446-11-9	Sulfur Trioxide		No HLC	--	--
1746-01-6	TCDD, 2,3,7,8-		--	--	--
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--
127-18-4	Tetrachloroethylene		--	--	--
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--
109-99-9	Tetrahydrofuran		--	--	--
7550-45-0	Titanium Tetrachloride		No HLC	--	--
108-88-3	Toluene		--	--	--
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--
71-55-6	Trichloroethane, 1,1,1-	3.3E+01	2.31E+01	No IUR	1.1E-03
79-00-5	Trichloroethane, 1,1,2-		--	--	--
79-01-6	Trichloroethylene	5.5E+00	2.21E+00	7.4E-07	2.5E-01
75-69-4	Trichlorofluoromethane		--	--	--
96-18-4	Trichloropropane, 1,2,3-		--	--	--
96-19-5	Trichloropropene, 1,2,3-		--	--	--
121-44-8	Triethylamine		--	--	--
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--
108-05-4	Vinyl Acetate		--	--	--
593-60-2	Vinyl Bromide		--	--	--
75-01-4	Vinyl Chloride		--	--	--
108-38-3	Xylene, m-		--	--	--

Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator I
		2.00E-02	I	
		2.00E-02	P	
		5.00E+00	I	
1.00E-03	X	2.00E-05	X	
		3.00E+00	I	
		1.00E-03	CA	
		7.00E-01	I	
		4.00E-02	H	
2.60E-07	CA	3.00E+00	I	
1.00E-08	I	6.00E-01	I	Mut
5.10E-03	CA			
		1.00E-01	P	
3.40E-05	CA	3.00E-03	I	
2.60E-04	CA	1.40E-05	CA	
4.00E-05	I	9.00E-03	I	
8.80E-06	P	5.00E-03	P	
2.70E-03	H	2.00E-02	I	
1.40E-02	I	4.00E-05	X	Mut
1.60E-03	I			
6.30E-03	CA			
		2.00E-02	P	
1.10E-03	E	1.30E-03	E	
1.10E-03	E	1.30E-03	E	
1.10E-03	E	1.30E-03	E	
1.10E-03	E	1.30E-03	E	
3.80E+00	E	4.00E-07	E	
		1.00E+00	P	
		3.00E-04	I	
		3.00E-04	I	
		8.00E-03	I	
		1.00E+00	X	
		3.00E+00	CA	
		2.00E+00	I	
3.70E-06	I	3.00E-02	I	
		1.00E+00	I	
		1.00E-03	CA	
3.80E+01	CA	4.00E-08	CA	
1.10E-02	E	1.30E-04	E	
7.40E-06	I			
5.80E-05	CA			
2.60E-07	I	4.00E-02	I	
		8.00E+01	I	
		2.00E+00	I	
		1.00E-04	A	
		5.00E+00	I	
		3.00E+01	H	
		2.00E-03	P	
		5.00E+00	I	
1.60E-05	I	2.00E-04	X	
4.10E-06	I	2.00E-03	I	Mut
		7.00E-01	H	
		3.00E-04	I	Mut
		3.00E-04	P	
		7.00E-03	I	
		5.00E-03	P	
		7.00E-03	P	TCE
		2.00E-01	I	
3.20E-05	H	3.00E-03	I	
4.40E-06	I	1.00E-01	I	Mut
		1.00E-01	S	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
95-47-6	Xylene, o-		–	–	–
106-42-3	Xylene, P-		–	–	–
1330-20-7	Xylenes		–	–	–
140-88-5	Ethyl Acrylate		–	–	–

Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	
		8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
	mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
	IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($(ug/m^3)^{-1}$)	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-	2.4E+00	5.51E-01	7.2E-08	No RfC	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)	3.6E+00	1.63E+00	No IUR	3.7E-05			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-26 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene		--	--	--	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-26 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ
95-47-6	Xylene, o-		--	--	--
106-42-3	Xylene, P-		--	--	--
1330-20-7	Xylenes		--	--	--
140-88-5	Ethyl Acrylate		--	--	--

Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator i
		1.00E-01	S	
		1.00E-01	S	
		1.00E-01	I	
		8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**

Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Trichloroethylene						
	mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
	IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

OSWER VAPOR INTRUSION ASSESSMENT

Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs

MW-26 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($ug/m^3)^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-402N 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m^3)$^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i
x	75-07-0	Acetaldehyde		--	--	--	2.20E-06	I	9.00E-03	I	
	67-64-1	Acetone		--	--	--			3.10E+01	A	
	75-86-5	Acetone Cyanohydrin		--	--	--			2.00E-03	X	
	75-05-8	Acetonitrile		--	--	--			6.00E-02	I	
	107-02-8	Acrolein		--	--	--			2.00E-05	I	
	79-10-7	Acrylic Acid		--	--	--			1.00E-03	I	
	107-13-1	Acrylonitrile		--	--	--	6.80E-05	I	2.00E-03	I	
	309-00-2	Aldrin		--	--	--	4.90E-03	I			
	107-18-6	Allyl Alcohol		--	--	--			1.00E-04	X	
	107-05-1	Allyl Chloride		--	--	--	6.00E-06	CA	1.00E-03	I	
	7664-41-7	Ammonia		--	--	--			1.00E-01	I	
	75-85-4	Amyl Alcohol, tert-		--	--	--			3.00E-03	X	
	12674-11-2	Aroclor 1016		--	--	--	2.00E-05	S			
	11104-28-2	Aroclor 1221		--	--	--	5.70E-04	S			
	11141-16-5	Aroclor 1232		--	--	--	5.70E-04	S			
	53469-21-9	Aroclor 1242		--	--	--	5.70E-04	S			
	12672-29-6	Aroclor 1248		--	--	--	5.70E-04	S			
	11097-69-1	Aroclor 1254		--	--	--	5.70E-04	S			
	11096-82-5	Aroclor 1260		--	--	--	5.70E-04	S			
x	103-33-3	Azobenzene		--	--	--	3.10E-05	I			
	56-55-3	Benz[a]anthracene		--	--	--	1.10E-04	CA			Mut
	71-43-2	Benzene		--	--	--	7.80E-06	I	3.00E-02	I	
	100-44-7	Benzyl Chloride		--	--	--	4.90E-05	CA	1.00E-03	P	
	92-52-4	Biphenyl, 1,1'-		--	--	--			4.00E-04	X	
	108-60-1	Bis(2-chloro-1-methylethyl) ether		--	--	--	1.00E-05	H			
	111-44-4	Bis(2-chloroethyl)ether		--	--	--	3.30E-04	I			
	542-88-1	Bis(chloromethyl)ether		--	--	--	6.20E-02	I			
	10294-34-5	Boron Trichloride		--	--	--			2.00E-02	P	
	7637-07-2	Boron Trifluoride		No HLC	--	--			1.30E-02	CA	
	107-04-0	Bromo-2-chloroethane, 1-		--	--	--	6.00E-04	X			
	108-86-1	Bromobenzene		--	--	--			6.00E-02	I	
	74-97-5	Bromochloromethane		--	--	--			4.00E-02	X	
	75-27-4	Bromodichloromethane		--	--	--	3.70E-05	CA			
	75-25-2	Bromoform		--	--	--	1.10E-06	I			
	74-83-9	Bromomethane		--	--	--			5.00E-03	I	
	106-99-0	Butadiene, 1,3-		--	--	--	3.00E-05	I	2.00E-03	I	
	78-92-2	Butyl alcohol, sec-		--	--	--			3.00E+01	P	
	75-15-0	Carbon Disulfide		--	--	--			7.00E-01	I	
	56-23-5	Carbon Tetrachloride		--	--	--	6.00E-06	I	1.00E-01	I	
	12789-03-6	Chlordane		--	--	--	1.00E-04	I	7.00E-04	I	
	7782-50-5	Chlorine		--	--	--			1.50E-04	A	
	10049-04-4	Chlorine Dioxide		--	--	--			2.00E-04	I	
	75-68-3	Chloro-1,1-difluoroethane, 1-		--	--	--			5.00E+01	I	
	126-99-8	Chloro-1,3-butadiene, 2-		--	--	--	3.00E-04	I	2.00E-02	I	
	108-90-7	Chlorobenzene		--	--	--			5.00E-02	P	
	98-56-6	Chlorobenzotrifluoride, 4-		--	--	--			3.00E-01	P	
	75-45-6	Chlorodifluoromethane		--	--	--			5.00E+01	I	
	67-66-3	Chloroform		--	--	--	2.30E-05	I	9.80E-02	A	
	74-87-3	Chloromethane		--	--	--			9.00E-02	I	
	107-30-2	Chloromethyl Methyl Ether		--	--	--	6.90E-04	CA			
	76-06-2	Chloropicrin		--	--	--			4.00E-04	CA	
	8007-45-2	Coke Oven Emissions		--	--	--	6.20E-04	I			Mut
	98-82-8	Cumene		--	--	--			4.00E-01	I	
x	57-12-5	Cyanide (CN-)		--	--	--			8.00E-04	S	
	110-82-7	Cyclohexane		--	--	--			6.00E+00	I	
	108-94-1	Cyclohexanone		--	--	--			7.00E-01	P	
	110-83-8	Cyclohexene		--	--	--			1.00E+00	X	
	72-55-9	DDE, p,p'-		--	--	--	9.70E-05	CA			
	96-12-8	Dibromo-3-chloropropane, 1,2-		--	--	--	6.00E-03	P	2.00E-04	I	Mut
	124-48-1	Dibromochloromethane		--	--	--	2.70E-05	CA			

OSWER VAPOR INTRUSION ASSESSMENT
Groundwater Concentration to Indoor Air Concentration (GWC-IAC) Calculator Version 3.4, June 2015 RSLs
MW-402N 2nd 2020

Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

	CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator
	106-93-4	Dibromoethane, 1,2-		--	--	--	6.00E-04	I	9.00E-03	I	
	74-95-3	Dibromomethane (Methylene Bromide)		--	--	--			4.00E-03	X	
	764-41-0	Dichloro-2-butene, 1,4-		--	--	--	4.20E-03	P			
	1476-11-5	Dichloro-2-butene, cis-1,4-		--	--	--	4.20E-03	P			
	110-57-6	Dichloro-2-butene, trans-1,4-		--	--	--	4.20E-03	P			
	95-50-1	Dichlorobenzene, 1,2-		--	--	--			2.00E-01	H	
	106-46-7	Dichlorobenzene, 1,4-		--	--	--	1.10E-05	CA	8.00E-01	I	
	75-71-8	Dichlorodifluoromethane		--	--	--			1.00E-01	X	
	75-34-3	Dichloroethane, 1,1-	4.4E-01	1.01E-01	1.3E-08	No RfC	1.60E-06	CA			
	107-06-2	Dichloroethane, 1,2-		--	--	--	2.60E-05	I	7.00E-03	P	
	75-35-4	Dichloroethylene, 1,1-		--	--	--			2.00E-01	I	
	78-87-5	Dichloropropane, 1,2-		--	--	--	1.00E-05	CA	4.00E-03	I	
	542-75-6	Dichloropropene, 1,3-		--	--	--	4.00E-06	I	2.00E-02	I	
	77-73-6	Dicyclopentadiene		--	--	--			3.00E-04	X	
	75-37-6	Difluoroethane, 1,1-		--	--	--			4.00E+01	I	
	94-58-6	Dihydrosafrole		--	--	--	1.30E-05	CA			
	108-20-3	Diisopropyl Ether		--	--	--			7.00E-01	P	
	68-12-2	Dimethylformamide		--	--	--			3.00E-02	I	
	57-14-7	Dimethylhydrazine, 1,1-		--	--	--			2.00E-06	X	
	540-73-8	Dimethylhydrazine, 1,2-		--	--	--	1.60E-01	CA			
	513-37-1	Dimethylvinylchloride		--	--	--	1.30E-05	CA			
	123-91-1	Dioxane, 1,4-		--	--	--	5.00E-06	I	3.00E-02	I	
	106-89-8	Epichlorohydrin		--	--	--	1.20E-06	I	1.00E-03	I	
	106-88-7	Epoxybutane, 1,2-		--	--	--			2.00E-02	I	
	111-15-9	Ethoxyethanol Acetate, 2-		--	--	--			6.00E-02	P	
	110-80-5	Ethoxyethanol, 2-		--	--	--			2.00E-01	I	
	141-78-6	Ethyl Acetate		--	--	--			7.00E-02	P	
	75-00-3	Ethyl Chloride (Chloroethane)		--	--	--			1.00E+01	I	
	97-63-2	Ethyl Methacrylate		--	--	--			3.00E-01	P	
	100-41-4	Ethylbenzene		--	--	--	2.50E-06	CA	1.00E+00	I	
	75-21-8	Ethylene Oxide		--	--	--	8.80E-05	CA	3.00E-02	CA	
	151-56-4	Ethyleneimine		--	--	--	1.90E-02	CA			
	50-00-0	Formaldehyde		--	--	--	1.30E-05	I	9.80E-03	A	
	64-18-6	Formic Acid		--	--	--			3.00E-04	X	
	98-01-1	Furfural		--	--	--			5.00E-02	H	
	765-34-4	Glycidyl		--	--	--			1.00E-03	H	
	76-44-8	Heptachlor		--	--	--	1.30E-03	I			
	1024-57-3	Heptachlor Epoxide		--	--	--	2.60E-03	I			
	39635-31-9	Heptachlorobiphenyl, 2,3,3',4,4',5,5'- (PCB 189)		--	--	--	1.10E-03	E	1.30E-03	E	
	118-74-1	Hexachlorobenzene		--	--	--	4.60E-04	I			
	38380-08-4	Hexachlorobiphenyl, 2,3,3',4,4',5- (PCB 156)		--	--	--	1.10E-03	E	1.30E-03	E	
	69782-90-7	Hexachlorobiphenyl, 2,3,3',4,4',5'- (PCB 157)		--	--	--	1.10E-03	E	1.30E-03	E	
	52663-72-6	Hexachlorobiphenyl, 2,3',4,4',5,5'- (PCB 167)		--	--	--	1.10E-03	E	1.30E-03	E	
	32774-16-6	Hexachlorobiphenyl, 3,3',4,4',5,5'- (PCB 169)		--	--	--	1.10E+00	E	1.30E-06	E	
	87-68-3	Hexachlorobutadiene		--	--	--	2.20E-05	I			
	77-47-4	Hexachlorocyclopentadiene		--	--	--			2.00E-04	I	
x	67-72-1	Hexachloroethane		--	--	--	1.10E-05	CA	3.00E-02	I	
	822-06-0	Hexamethylene Diisocyanate, 1,6-		--	--	--			1.00E-05	I	
	110-54-3	Hexane, N-		--	--	--			7.00E-01	I	
	591-78-6	Hexanone, 2-		--	--	--			3.00E-02	I	
	302-01-2	Hydrazine		--	--	--	4.90E-03	I	3.00E-05	P	
	7647-01-0	Hydrogen Chloride		--	--	--			2.00E-02	I	
	74-90-8	Hydrogen Cyanide		--	--	--			8.00E-04	I	
	7664-39-3	Hydrogen Fluoride		--	--	--			1.40E-02	CA	
	7783-06-4	Hydrogen Sulfide		--	--	--			2.00E-03	I	
	67-63-0	Isopropanol		--	--	--			2.00E-01	P	
	7439-97-6	Mercury (elemental)		--	--	--			3.00E-04	I	
	126-98-7	Methacrylonitrile		--	--	--			3.00E-02	P	
	67-56-1	Methanol		--	--	--			2.00E+01	I	
	110-49-6	Methoxyethanol Acetate, 2-		--	--	--			1.00E-03	P	

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CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator
109-86-4	Methoxyethanol, 2-		--	--	--			2.00E-02	I	
96-33-3	Methyl Acrylate		--	--	--			2.00E-02	P	
78-93-3	Methyl Ethyl Ketone (2-Butanone)		--	--	--			5.00E+00	I	
60-34-4	Methyl Hydrazine		--	--	--	1.00E-03	X	2.00E-05	X	
108-10-1	Methyl Isobutyl Ketone (4-methyl-2-pentanone)		--	--	--			3.00E+00	I	
624-83-9	Methyl Isocyanate		--	--	--			1.00E-03	CA	
80-62-6	Methyl Methacrylate		--	--	--			7.00E-01	I	
25013-15-4	Methyl Styrene (Mixed Isomers)		--	--	--			4.00E-02	H	
1634-04-4	Methyl tert-Butyl Ether (MTBE)		--	--	--	2.60E-07	CA	3.00E+00	I	
75-09-2	Methylene Chloride		--	--	--	1.00E-08	I	6.00E-01	I	Mut
2385-85-5	Mirex		--	--	--	5.10E-03	CA			
64742-95-6	Naphtha, High Flash Aromatic (HFAN)		No HLC	--	--			1.00E-01	P	
91-20-3	Naphthalene		--	--	--	3.40E-05	CA	3.00E-03	I	
13463-39-3	Nickel Carbonyl		No HLC	--	--	2.60E-04	CA	1.40E-05	CA	
98-95-3	Nitrobenzene		--	--	--	4.00E-05	I	9.00E-03	I	
75-52-5	Nitromethane		--	--	--	8.80E-06	P	5.00E-03	P	
79-46-9	Nitropropane, 2-		--	--	--	2.70E-03	H	2.00E-02	I	
62-75-9	Nitrosodimethylamine, N-		--	--	--	1.40E-02	I	4.00E-05	X	Mut
924-16-3	Nitroso-di-N-butylamine, N-		--	--	--	1.60E-03	I			
10595-95-6	Nitrosomethylethylamine, N-		--	--	--	6.30E-03	CA			
111-84-2	Nonane, n-		--	--	--			2.00E-02	P	
32598-14-4	Pentachlorobiphenyl, 2,3,3',4,4'- (PCB 105)		--	--	--	1.10E-03	E	1.30E-03	E	
74472-37-0	Pentachlorobiphenyl, 2,3,4,4',5- (PCB 114)		--	--	--	1.10E-03	E	1.30E-03	E	
31508-00-6	Pentachlorobiphenyl, 2,3',4,4',5- (PCB 118)		--	--	--	1.10E-03	E	1.30E-03	E	
65510-44-3	Pentachlorobiphenyl, 2',3,4,4',5- (PCB 123)		--	--	--	1.10E-03	E	1.30E-03	E	
57465-28-8	Pentachlorobiphenyl, 3,3',4,4',5- (PCB 126)		--	--	--	3.80E+00	E	4.00E-07	E	
109-66-0	Pentane, n-		--	--	--			1.00E+00	P	
75-44-5	Phosgene		--	--	--			3.00E-04	I	
7803-51-2	Phosphine		--	--	--			3.00E-04	I	
123-38-6	Propionaldehyde		--	--	--			8.00E-03	I	
103-65-1	Propyl benzene		--	--	--			1.00E+00	X	
115-07-1	Propylene		--	--	--			3.00E+00	CA	
107-98-2	Propylene Glycol Monomethyl Ether		--	--	--			2.00E+00	I	
75-56-9	Propylene Oxide		--	--	--	3.70E-06	I	3.00E-02	I	
100-42-5	Styrene		--	--	--			1.00E+00	I	
7446-11-9	Sulfur Trioxide		No HLC	--	--			1.00E-03	CA	
1746-01-6	TCDD, 2,3,7,8-		--	--	--	3.80E+01	CA	4.00E-08	CA	
70362-50-4	Tetrachlorobiphenyl, 3,4,4',5- (PCB 81)		--	--	--	1.10E-02	E	1.30E-04	E	
630-20-6	Tetrachloroethane, 1,1,1,2-		--	--	--	7.40E-06	I			
79-34-5	Tetrachloroethane, 1,1,2,2-		--	--	--	5.80E-05	CA			
127-18-4	Tetrachloroethylene		--	--	--	2.60E-07	I	4.00E-02	I	
811-97-2	Tetrafluoroethane, 1,1,1,2-		--	--	--			8.00E+01	I	
109-99-9	Tetrahydrofuran		--	--	--			2.00E+00	I	
7550-45-0	Titanium Tetrachloride		No HLC	--	--			1.00E-04	A	
108-88-3	Toluene		--	--	--			5.00E+00	I	
76-13-1	Trichloro-1,2,2-trifluoroethane, 1,1,2-		--	--	--			3.00E+01	H	
120-82-1	Trichlorobenzene, 1,2,4-		--	--	--			2.00E-03	P	
71-55-6	Trichloroethane, 1,1,1-		--	--	--			5.00E+00	I	
79-00-5	Trichloroethane, 1,1,2-		--	--	--	1.60E-05	I	2.00E-04	X	
79-01-6	Trichloroethylene		--	--	--	4.10E-06	I	2.00E-03	I	Mut
75-69-4	Trichlorofluoromethane		--	--	--			7.00E-01	H	
96-18-4	Trichloropropane, 1,2,3-		--	--	--			3.00E-04	I	Mut
96-19-5	Trichloropropene, 1,2,3-		--	--	--			3.00E-04	P	
121-44-8	Triethylamine		--	--	--			7.00E-03	I	
526-73-8	Trimethylbenzene, 1,2,3-		--	--	--			5.00E-03	P	
95-63-6	Trimethylbenzene, 1,2,4-		--	--	--			7.00E-03	P	TCE
108-05-4	Vinyl Acetate		--	--	--			2.00E-01	I	
593-60-2	Vinyl Bromide		--	--	--	3.20E-05	H	3.00E-03	I	
75-01-4	Vinyl Chloride		--	--	--	4.40E-06	I	1.00E-01	I	Mut
108-38-3	Xylene, m-		--	--	--			1.00E-01	S	

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Parameter	Symbol	Value	Instructions
Exposure Scenario	Scenario	Commercial	Select residential or commercial scenario from pull down list
Target Risk for Carcinogens	TCR	1.00E-06	Enter target risk for carcinogens (for comparison to the calculated VI carcinogenic risk in column F)
Target Hazard Quotient for Non-Carcinogens	THQ	1	Enter target hazard quotient for non-carcinogens (for comparison to the calculated VI hazard in column G)
Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m³)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR (ug/m³)⁻¹	IUR Source*	Reference Concentration RfC (mg/m³)	RFC Source*	Mutagenic Indicator
95-47-6	Xylene, o-		--	--	--			1.00E-01	S	
106-42-3	Xylene, P-		--	--	--			1.00E-01	S	
1330-20-7	Xylenes		--	--	--			1.00E-01	I	
140-88-5	Ethyl Acrylate		--	--	--			8.00E-03	P	

Notes:

(1) **Inhalation Pathway Exposure Parameters (RME):**

Exposure Scenario	Units	Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Averaging time for carcinogens	(yrs)	ATc_R_GW	70	ATc_C_GW	70	ATc_GW	70
Averaging time for non-carcinogens	(yrs)	ATnc_R_GW	26	ATnc_C_GW	25	Atnc_GW	25
Exposure duration	(yrs)	ED_R_GW	26	ED_C_GW	25	ED_GW	25
Exposure frequency	(days/yr)	EF_R_GW	350	EF_C_GW	250	EF_GW	250
Exposure time	(hr/day)	ET_R_GW	24	ET_C_GW	8	ET_GW	8

(2) **Generic Attenuation Factors:**

Source Medium of Vapors		Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
Groundwater	(-)	AFgw_R_GW	0.001	AFgw_C_GW	0.001	AFgw_GW	0.001
Sub-Slab and Exterior Soil Gas	(-)	AFss_R_GW	0.03	AFss_C_GW	0.03	AFss_GW	0.03

(3) **Formulas**
Cia, target = MIN(Cia,c; Cia,nc)
Cia,c (ug/m3) = TCR x ATc x (365 days/yr) x (24 hrs/day) / (ED x EF x ET x IUR)
Cia,nc (ug/m3) = THQ x ATnc x (365 days/yr) x (24 hrs/day) x RfC x (1000 ug/mg) / (ED x EF x ET)

(4) **Special Case Chemicals**

Trichloroethylene

Residential Symbol	Residential Value	Commercial Symbol	Commercial Value	Selected (based on scenario) Symbol	Selected (based on scenario) Value
mIURTCE_R_GW	1.00E-06	IURTCE_C_GW	0.00E+00	mIURTCE_GW	0.00E+00
IURTCE_R_GW	3.10E-06	IURTCE_C_GW	4.10E-06	IURTCE_GW	4.10E-06

Mutagenic Chemicals — The exposure durations and age-dependent adjustment factors for mutagenic-mode-of-action are listed in the table below:

Note: This section applies to trichloroethylene and other mutagenic chemicals, but not to vinyl chloride.

Age Cohort	Exposure Duration	Age-dependent adjustment factor
0 - 2 years	2	10
2 - 6 years	4	3
6 - 16 years	10	3
16 - 26 years	10	1

Mutagenic-mode-of-action (MMOA) adjustment factor 25 This factor is used in the equations for mutagenic chemicals.

Vinyl Chloride — See the Navigation Guide equation for Cia,c for vinyl chloride.

Notation:
I = IRIS: EPA Integrated Risk Information System (IRIS). Available online at: http://www.epa.gov/iris/subst/index.html
P = PPRTV. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs). Available online at: http://hhpprtv.ornl.gov/pprtv.shtml
A = Agency for Toxic Substances and Disease Registry (ATSDR) Minimum Risk Levels (MRLs). Available online at: http://www.atsdr.cdc.gov/mrls/index.html
CA = California Environmental Protection Agency/Office of Environmental Health Hazard Assessment assessments. Available online at: http://www.oehha.ca.gov/risk/ChemicalDB/index.asp
H = HEAST. EPA Superfund Health Effects Assessment Summary Tables (HEAST) database. Available online at: http://epa-heast.ornl.gov/heast.shtml
S = See RSL User Guide, Section 5
X = PPRTV Appendix
Mut = Chemical acts according to the mutagenic-mode-of-action, special exposure parameters apply (see footnote (4) above).
VC = Special exposure equation for vinyl chloride applies (see Navigation Guide for equation).
TCE = Special mutagenic and non-mutagenic IURs for trichloroethylene apply (see footnote (4) above).
Yellow highlighting indicates site-specific parameters that may be edited by the user.
Blue highlighting indicates exposure factors that are based on Risk Assessment Guidance for Superfund (RAGS) or EPA vapor intrusion guidance, which generally should not be changed.

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Average Groundwater Temperature (°C)	Tgw	25	Enter average of the stabilized groundwater temperature to correct Henry's Law Constant for groundwater target concentrations

CAS	Chemical Name	Site Groundwater Concentration Cgw (ug/L)	Calculated Indoor Air Concentration Cia (ug/m^3)	VI Carcinogenic Risk CR	VI Hazard HQ	Inhalation Unit Risk IUR ($ug/m^3)^{-1}$	IUR Source*	Reference Concentration RfC (mg/m^3)	RFC Source*	Mutagenic Indicator i

Pink highlighting indicates VI carcinogenic risk greater than the target risk for carcinogens (TCR) or VI Hazard greater than or equal to the target hazard quotient for non-carcinogens (THQ).