Rose & Westra
A Division of GZA

GEOTECHNICAL
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MEMORANDUM

To: Abby Hendershott, EGLE

From: Leslie Nelson, Rose & Westra, a Division of GZA GeoEnvironmental, Inc.

Date: November 4, 2019

File No.: 16.0062677.81 Task 001

Re: Wolverine World Wide, Inc. (Wolverine) – Wolven/Jewell RI – Monthly Progress Report

This Monthly Progress Report (MPR) is being provided at the request of EGLE to provide an update regarding the implementation of the December 13, 2017 Source Area Investigation Work Plan (WP) related to per- and polyfluorinated alkyl substances (PFAS) detected in residential wells in the Wolven/Jewell study area.

ACTIONS PERFORMED

During this period, September 24, 2019 through October 24, 2019, GZA has done the following:

1. Continued work to obtain access to additional drilling location WV-PMW-17, located north and west of the WV-MW-16 series of wells.

ANALYTICAL DATA RECIEVED

The 3rd quarter groundwater sampling event data was received during this reporting period and is summarized in Tables 1A through 1E.

ANTICIPATED ACTIONS AND SCHEDULE FOR NEXT REPORTING PERIOD

During the next reporting period, October 25, 2019 to November 22, 2019, R&W/GZA anticipates the following activities:

1) Continue to work for access to location WV-PMW-17 for possible additional monitoring wells.

2) Prepare for and begin 4th quarter groundwater sampling event.

An Equal Opportunity Employer M/F/V/H

TABLE 1A
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - VOCS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-1	WV-MW-2D	WV-MW-2S	WV-MW-3D	WV-MW-3S	WV-MW-4	WV-MW-5D	WV-MW-5S	WV-MW-6D	WV-MW-6S	WV-MW-7D	WV-MW-7M	WV-MW-7S
Sample Name						WV-GW-MW1	WV-GW-MW2D	WV-GW-MW2S	WV-GW-MW3D	WV-GW-MW3S	WV-GW-MW4	WV-GW-MW5D	WV-GW-MW5S	WV-GW-MW6D	WV-GW-MW6S	WV-GW-MW 7D	WV-GW-MW 7M	WV-GW-MW 7S
Depth Interval (feet below ground surface)						135-140	25-35	20-25	56-61	5-10	130-135	67-72	60-65	98-103	13-18	15.7-20.5	50-55	90.2-95
Laboratory Sample ID(s)						UI05007-008	UI05007-005	UI05007-004	UI05007-010	UI05007-011	UI05007-002	UI05007-001	UI05007-003	UH29005-021	UH29005-020	UH29005-001	UH29005-003	UH29005-002
Sample Date						09/04/2019	09/03/2019	09/03/2019	09/04/2019	09/04/2019	09/03/2019	09/03/2019	09/03/2019	08/28/2019	08/28/2019	08/26/2019	08/26/2019	08/26/2019
Parameter (µg/L)																		
Acetone	730	1,700	1,000,000,000 (D,S)	12,000,000	42,000	<20	26	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	5.0 (A)	200	5,600	14	46	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	80 (A,W)	ID	4,800	NCL	13	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	80 (A,W)	ID	470,000	NCL	330	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl ethyl ketone (2-Butanone)	13,000	2,200	240,000,000 (S)	NCL	17,000	<10	7.9 [J]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane (Methyl bromide)	10	5.0 (M)	4,000	NCL	23	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Carbon disulfide	800	ID	250,000	NCL	2,400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	5.0 (A)	38	370	NCL	46	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	100 (A)	25	210,000	540	230	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	430	1,100	5,700,000 (S)	6,700	63,000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chloroform	80 (A,W)	350	28,000	7.6	22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane (Methyl chloride)	260	ID	8,600	160	560	<1	<1	<1	<1	<1	0.55 [J]	<1	<1	<1	<1	<1	<1	0.59 [J]
Cyclohexane	NCL	NCL	NCL	NCL	38,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane (DBCP)	0.20 (A)	ID	220	NCL	0.033	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	80 (A,W)	ID	14,000	NCL	87	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromoethane (Ethylene dibromide)	0.05 (A)	5.7	2,400	NCL	0.75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	600 (A)	13	160,000 (S)	NCL	910	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	6.6	28	18,000	52	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75 (A)	17	16,000	120	48	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	1,700	ID	220,000	NCL	590	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	880	740	1,000,000	67	280	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	5.0 (A)	360	9,600	NCL	17	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethylene	7.0 (A)	130	200	170	850	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	70 (A)	620	93,000	48	110	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethylene	100 (A)	1,500	85,000	650	1,100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	5.0 (A)	230	16,000	NCL	25	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorpropene (Calculated: cis + trans)	8.5	9.0	3,900	NCL	47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	74 (E)	18	110,000	45	150	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	1,000	ID	4,200,000	NCL	110	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Isopropyl benzene	800	28	56,000 (S)	NCL	1,400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl acetate	NCL	NCL	NCL	NCL	60,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tertiary butyl ether (MTBE)	40 (E)	7,100	47,000,000 (S)	4,000	1,400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl isobutyl ketone	1,800	ID	20,000,000 (S)	NCL	19,000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylcyclohexane	NCL	NCL	NCL	NCL	NCL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	5.0 (A)	1,500	220,000	3,900	320	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	100 (A)	80	170,000	NCL	3,600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	8.5	78	12,000	NCL	7.6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethylene	5.0 (A)	60	25,000	96	120	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	790 (E)	270	530,000 (S)	23,000	3,300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloro-1,2,2-trifluoroethane	170,000 (S)	32	170,000 (S)	NCL	31,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	70 (A)	99	300,000 (S)	95	12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	200 (A)	89	660,000	8,600	24,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	5.0 (A)	330	17,000	NCL	1.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethylene	5.0 (A)	200	2,200	6.1	8.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	2,600	NA	1,100,000 (S)	NCL	15,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	2.0 (A)	13	1,100	0.96 (M)	1.9	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes (Total)	280 (E)	49	190,000 (S)	1,200	580	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
m+p - Xylenes	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene	NCL	NCL	NCL	NCL	580	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trihalomethanes (Calculation: Bromodichloromethane + Bromoform + Chloroform + Dibromochloromethane)	80 (W)	NCL	NCL	NCL	NCL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 1A
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - VOCS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-8D	WV-MW-8M	WV-MW-8S	WV-MW-9	WV-MW-10D	WV-MW-10M	WV-MW-10S	WV-MW-11D	WV-MW-11S	WV-MW-12D	WV-MW-12M	WV-MW-12S	WV-MW-13D
Sample Name						WV-GW-MW 8D	WV-GW-MW 8M	WV-GW-MW 8S	WV-GW-MW9	WV-GW-MW10D	WV-GW-MW10M	WV-GW-MW10S	WV-GW-MW11D	WV-GW-MW11S	WV-GW-MW12D	WV-GW-MW12M	WV-GW-MW12S	WV-GW-MW13D
Depth Interval (feet below ground surface)						115-120	60-65	30-35	92.3-97.3	165-170	70-75	10-15	158.9-163.9	28.8-33.8	176.5-181.5	144.5-149.4	74.6-79.5	58-63
Laboratory Sample ID(s)						UH29005-004	UH29005-005	UH29005-006	UI05007-009	UH29005-011	UH29005-009	UH29005-010	UH29005-012	UH29005-013	UH31001-004	UH31001-007	UH31001-003	UH29005-017
Sample Date						08/26/2019	08/26/2019	08/26/2019	09/04/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/29/2019	08/30/2019	08/29/2019	08/28/2019
Parameter (µg/L)																		
Acetone	730	1,700	1,000,000,000 (D,S)	12,000,000	42,000	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzene	5.0 (A)	200	5,600	14	46	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	80 (A,W)	ID	4,800	NCL	13	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromoform	80 (A,W)	ID	470,000	NCL	330	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl ethyl ketone (2-Butanone)	13,000	2,200	240,000,000 (S)	NCL	17,000	<10	<10	<10	3 [J]	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromomethane (Methyl bromide)	10	5.0 (M)	4,000	NCL	23	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Carbon disulfide	800	ID	250,000	NCL	2,400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	5.0 (A)	38	370	NCL	46	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	100 (A)	25	210,000	540	230	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloroethane	430	1,100	5,700,000 (S)	6,700	63,000	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Chloroform	80 (A,W)	350	28,000	7.6	22	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloromethane (Methyl chloride)	260	ID	8,600	160	560	<1	<1	<1	0.77 [J]	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	NCL	NCL	NCL	NCL	38,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane (DBCP)	0.20 (A)	ID	220	NCL	0.033	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	80 (A,W)	ID	14,000	NCL	87	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromoethane (Ethylene dibromide)	0.05 (A)	5.7	2,400	NCL	0.75	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	600 (A)	13	160,000 (S)	NCL	910	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	6.6	28	18,000	52	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75 (A)	17	16,000	120	48	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	1,700	ID	220,000	NCL	590	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	880	740	1,000,000	67	280	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	5.0 (A)	360	9,600	NCL	17	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethylene	7.0 (A)	130	200	170	850	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	70 (A)	620	93,000	48	110	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethylene	100 (A)	1,500	85,000	650	1,100	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	5.0 (A)	230	16,000	NCL	25	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorpropene (Calculated: cis + trans)	8.5	9.0	3,900	NCL	47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	74 (E)	18	110,000	45	150	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	1,000	ID	4,200,000	NCL	110	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Isopropyl benzene	800	28	56,000 (S)	NCL	1,400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl acetate	NCL	NCL	NCL	NCL	60,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl tertiary butyl ether (MTBE)	40 (E)	7,100	47,000,000 (S)	4,000	1,400	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methyl isobutyl ketone	1,800	ID	20,000,000 (S)	NCL	19,000	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Methylcyclohexane	NCL	NCL	NCL	NCL	NCL	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	5.0 (A)	1,500	220,000	3,900	320	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	100 (A)	80	170,000	NCL	3,600	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	8.5	78	12,000	NCL	7.6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethylene	5.0 (A)	60	25,000	96	120	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	790 (E)	270	530,000 (S)	23,000	3,300	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloro-1,2,2-trifluoroethane	170,000 (S)	32	170,000 (S)	NCL	31,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	70 (A)	99	300,000 (S)	95	12	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	200 (A)	89	660,000	8,600	24,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	5.0 (A)	330	17,000	NCL	1.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethylene	5.0 (A)	200	2,200	6.1	8.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	2,600	NA	1,100,000 (S)	NCL	15,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	2.0 (A)	13	1,100	0.96 (M)	1.9	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylenes (Total)	280 (E)	49	190,000 (S)	1,200	580	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
m+p - Xylenes	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
o-Xylene	NCL	NCL	NCL	NCL	580	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trihalomethanes (Calculation: Bromodichloromethane + Bromoform + Chloroform + Dibromochloromethane)	80 (W)	NCL	NCL	NCL	NCL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 1A
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - VOCS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-13M	WV-MW-13S	WV-MW-14D	WV-MW-14S	WV-MW-16D	WV-MW-16S	WV-MW-16S
Sample Name						WV-GW-MW13M	WV-GW-MW13S	WV-GW-MW14D	WV-GW-MW14S	WV-GW-MW16D	WV-GW-MW16S	WV-GW-MW16S DUP
Depth Interval (feet below ground surface)						18-23	1.5-6.5	140-145	9-14	91-96	17-22	17-22
Laboratory Sample ID(s)						UH29005-019	UH29005-016	UH29005-018	UH29005-015	UH31001-005	UH31001-001	UH31001-002
Sample Date						08/28/2019	08/28/2019	08/28/2019	08/28/2019	08/29/2019	08/29/2019	08/29/2019
Parameter (µg/L)												
Acetone	730	1,700	1,000,000,000 (D,S)	12,000,000	42,000	<20	<20	<20	<20	5 [J]	<20	<20
Benzene	5.0 (A)	200	5,600	14	46	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	80 (A,W)	ID	4,800	NCL	13	<1	<1	<1	<1	<1	<1	<1
Bromoform	80 (A,W)	ID	470,000	NCL	330	<1	<1	<1	<1	<1	<1	<1
Methyl ethyl ketone (2-Butanone)	13,000	2,200	240,000,000 (S)	NCL	17,000	<10	<10	<10	<10	<10	<10	<10
Bromomethane (Methyl bromide)	10	5.0 (M)	4,000	NCL	23	<2	<2	<2	<2	<2	<2	<2
Carbon disulfide	800	ID	250,000	NCL	2,400	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	5.0 (A)	38	370	NCL	46	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	100 (A)	25	210,000	540	230	<1	<1	<1	<1	<1	<1	<1
Chloroethane	430	1,100	5,700,000 (S)	6,700	63,000	<2	<2	<2	<2	<2	<2	<2
Chloroform	80 (A,W)	350	28,000	7.6	22	<1	<1	<1	<1	<1	<1	<1
Chloromethane (Methyl chloride)	260	ID	8,600	160	560	<1	<1	<1	<1	<1	<1	<1
Cyclohexane	NCL	NCL	NCL	NCL	38,000	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane (DBCP)	0.20 (A)	ID	220	NCL	0.033	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	80 (A,W)	ID	14,000	NCL	87	<1	<1	<1	<1	<1	<1	<1
1,2-Dibromoethane (Ethylene dibromide)	0.05 (A)	5.7	2,400	NCL	0.75	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	600 (A)	13	160,000 (S)	NCL	910	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	6.6	28	18,000	52	NCL	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	75 (A)	17	16,000	120	48	<1	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	1,700	ID	220,000	NCL	590	<2	<2	<2	<2	<2	<2	<2
1,1-Dichloroethane	880	740	1,000,000	67	280	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	5.0 (A)	360	9,600	NCL	17	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethylene	7.0 (A)	130	200	170	850	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethylene	70 (A)	620	93,000	48	110	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethylene	100 (A)	1,500	85,000	650	1,100	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	5.0 (A)	230	16,000	NCL	25	<1	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1
1,3-Dichlorpropene (Calculated: cis + trans)	8.5	9.0	3,900	NCL	47	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	74 (E)	18	110,000	45	150	<1	<1	<1	<1	<1	<1	<1
2-Hexanone	1,000	ID	4,200,000	NCL	110	<10	<10	<10	<10	<10	<10	<10
Isopropyl benzene	800	28	56,000 (S)	NCL	1,400	<1	<1	<1	<1	<1	<1	<1
Methyl acetate	NCL	NCL	NCL	NCL	60,000	<1	<1	<1	<1	<1	<1	<1
Methyl tertiary butyl ether (MTBE)	40 (E)	7,100	47,000,000 (S)	4,000	1,400	<1	<1	<1	<1	<1	<1	<1
Methyl isobutyl ketone	1,800	ID	20,000,000 (S)	NCL	19,000	<10	<10	<10	<10	<10	<10	<10
Methylcyclohexane	NCL	NCL	NCL	NCL	NCL	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride	5.0 (A)	1,500	220,000	3,900	320	<1	<1	<1	<1	1.1	<1	<1
Styrene	100 (A)	80	170,000	NCL	3,600	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	8.5	78	12,000	NCL	7.6	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethylene	5.0 (A)	60	25,000	96	120	<1	<1	<1	<1	<1	<1	<1
Toluene	790 (E)	270	530,000 (S)	23,000	3,300	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloro-1,2,2-trifluoroethane	170,000 (S)	32	170,000 (S)	NCL	31,000	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	70 (A)	99	300,000 (S)	95	12	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	200 (A)	89	660,000	8,600	24,000	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	5.0 (A)	330	17,000	NCL	1.2	<1	<1	<1	<1	<1	<1	<1
Trichloroethylene	5.0 (A)	200	2,200	6.1	8.5	<1	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	2,600	NA	1,100,000 (S)	NCL	15,000	<1	<1	<1	<1	<1	<1	<1
Vinyl Chloride	2.0 (A)	13	1,100	0.96 (M)	1.9	<1	<1	<1	<1	<1	<1	<1
Xylenes (Total)	280 (E)	49	190,000 (S)	1,200	580	<1	<1	<1	<1	<1	<1	<1
m+p - Xylenes	NCL	NCL	NCL	NCL	NCL	<1	<1	<1	<1	<1	<1	<1
o-Xylene	NCL	NCL	NCL	NCL	580	<1	<1	<1	<1	<1	<1	<1
Trihalomethanes (Calculation: Bromodichloromethane + Bromoform + Chloroform + Dibromochloromethane)	80 (W)	NCL	NCL	NCL	NCL	ND	ND	ND	ND	ND	ND	ND

TABLE 1B
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - SVOCS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-1	WV-MW-2D	WV-MW-2S	WV-MW-3D	WV-MW-3S	WV-MW-4	WV-MW-5D	WV-MW-5S	WV-MW-6D	WV-MW-6S	WV-MW-7D	WV-MW-7M	WV-MW-7S
Sample Name						WV-GW-MW1	WV-GW-MW2D	WV-GW-MW2S	WV-GW-MW3D	WV-GW-MW3S	WV-GW-MW4	WV-GW-MW5D	WV-GW-MW5S	WV-GW-MW6D	WV-GW-MW6S	WV-GW-MW 7D	WV-GW-MW 7M	WV-GW-MW 7S
Depth Interval (feet below ground surface)						135-140	25-35	20-25	56-61	5-10	130-135	67-72	60-65	98-103	13-18	15.7-20.5	50-55	90.2-95
Laboratory Sample ID(s)						UI05007-008	UI05007-005	UI05007-004	UI05007-010	UI05007-011	UI05007-002	UI05007-001	UI05007-003	UH29005-021	UH29005-020	UH29005-001	UH29005-003	UH29005-002
Sample Date						09/04/2019	09/03/2019	09/03/2019	09/04/2019	09/04/2019	09/03/2019	09/03/2019	09/03/2019	08/28/2019	08/28/2019	08/26/2019	08/26/2019	08/26/2019
Parameter (µg/L)																		
Acenaphthene	1,300	38	4,200 (S)	NCL	1,600	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	52	ID	3,900 (S)	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acetophenone	1,500	ID	6,100,000 (S)	NCL	5,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Anthracene	43 (S)	ID	43 (S)	NCL	5,300	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Atrazine	3.0 (A)	7.3	NLV	NCL	30	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Benzidine	0.30 (M)	0.30 (M)	NLV	NCL	0.011	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzo[a]anthracene	2.1	ID	NLV	NCL	3.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[a]pyrene	5.0 (A)	ID	NLV	NCL	2.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[b]fluoranthene (3,4-Benzofluoranthene)	1.5 (S,AA)	ID	ID	NCL	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[g,h,i]perylene	1.0 (M)	ID	NLV	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[k]fluoranthene	1.0 (M)	NA	NLV	NCL	250	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Butyl benzyl phthalate	1,200	67	NLV	NCL	1,600	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Caprolactam	5,800	NA	NLV	NCL	30,000	1.4 [BJ]	4.9 [B]	5.6 [B]	5 [B]	5.5 [B]	1.1 [BJ]	5.7 [B]	4.2 [B]	<1.6	<1.6	2.9 [B]	2.1 [B]	1.4 [BJ]
Carbazole	85	10 (M)	NLV	NCL	NCL	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
p-Chloro-m-cresol	150	7.4	NLV	NCL	4,300	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
bis(2-chloroethyl)ether	2.0	1.0 (M)	38,000	NCL	1.4	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Chloronaphthalene	1,800	NA	ID	NCL	2,200	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Chlorophenol	45	18	490,000	NCL	270	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chrysene	1.6 (S)	ID	ID	NCL	2,500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzo[a,h]anthracene	2.0 (M)	ID	NLV	NCL	2.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzofuran	ID	4.0	10,000 (S)	NCL	24	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
3,3'-Dichlorobenzidine	1.1	0.30 (M)	NLV	NCL	13	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
2,4-Dichlorophenol	73	11	NLV	NCL	140	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Diethyl phthalate	5,500	110	NLV	NCL	45,000	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Dimethyl phthalate	73,000	NA	NLV	NCL	NCL	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2,4-Dimethylphenol	370	380	NLV	NCL	1,100	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Di-n-butyl phthalate	880	9.7	NLV	NCL	2,700	<0.8	0.72 [J]	0.68 [J]	<0.8	0.55 [J]	<0.8	<0.8	0.56 [J]	<0.8	<0.8	<0.8	<0.8	<0.8
4,6-Dinitro-o-cresol	20 (M)	NA	NLV	NCL	4.5	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
2,4-Dinitrotoluene	7.7	NA	NLV	NCL	24	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Di-n-octyl phthalate	130	ID	NLV	NCL	600	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Azobenzene	23	ID	6,400 (S)	NCL	12	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
bis(2-Ethylhexyl)phthalate	6.0 (A)	14	NLV	NCL	560	0.98 [BJ]	1.1 [BJ]	0.7 [BJ]	0.99 [BJ]	1.3 [BJ]	0.66 [BJ]	0.96 [BJ]	0.74 [BJ]	0.92 [BJ]	1 [BJ]	1.5 [BJ]	1.1 [BJ]	1.6 [BJ]
Fluoranthene	210 (S)	1.6	210 (S)	NCL	2,400	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	880	12	2,000 (S)	NCL	880	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hexachlorobenzene	1.0 (A)	0.2 (M)	440	NCL	0.98	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Hexachlorobutadiene	15	0.053	1,600	NCL	14	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Hexachlorocyclopentadiene	50 (A)	ID	130	NCL	1.2	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Hexachloroethane	7.3	6.7	27,000	NCL	19	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Indeno[1,2,3-cd]pyrene	2.0 (M)	ID	NLV	NCL	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Isophorone	770	1,300	NLV	NCL	7,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Methylnaphthalene	260	19	25,000 (S)	NCL	110	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Methylphenol	NCL	NCL	NCL	NCL	2,800	<0.8	0.37 [J]	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
4-Methylphenol	NCL	NCL	NCL	NCL	5,600	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Naphthalene	520	11	31,000 (S)	NCL	17	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrobenzene	3.4	180	280,000	NCL	14	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Nitrophenol	20	ID	NLV	NCL	NCL	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
n-Nitroso-di-n-propylamine	5.0 (M)	NA	NLV	NCL	1.1	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
n-Nitrosodiphenylamine	270	NA	NLV	NCL	1,200	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Pentachlorophenol	1.0 (A)	1.8 (G)	NLV	NCL	4.1	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Phenanthrene	52	2.0 (M)	1,000 (S)	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Phenol	4,400	450	NLV	NCL	17,000	<0.8	1.7	0.64 [J]	0.75 [J]	0.64 [J]	<0.8	0.65 [J]	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Pyrene	140 (S)	ID	140 (S)	NCL	360	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2,4,5-Trichlorophenol	730	NA	NLV	NCL	3,500	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2,4,6-Trichlorophenol	120	5.0	NLV	NCL	36	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8

TABLE 1B
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - SVOCS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-8D	WV-MW-8M	WV-MW-8S	WV-MW-9	WV-MW-10D	WV-MW-10M	WV-MW-10S	WV-MW-11D	WV-MW-11S	WV-MW-12D	WV-MW-12M	WV-MW-12S	WV-MW-13D
Sample Name						WV-GW-MW 8D	WV-GW-MW 8M	WV-GW-MW 8S	WV-GW-MW9	WV-GW-MW10D	WV-GW-MW10M	WV-GW-MW10S	WV-GW-MW11D	WV-GW-MW11S	WV-GW-MW12D	WV-GW-MW12M	WV-GW-MW12S	WV-GW-MW13D
Depth Interval (feet below ground surface)						115-120	60-65	30-35	92.3-97.3	165-170	70-75	10-15	158.9-163.9	28.8-33.8	176.5-181.5	144.5-149.4	74.6-79.5	58-63
Laboratory Sample ID(s)						UH29005-004	UH29005-005	UH29005-006	UI05007-009	UH29005-011	UH29005-009	UH29005-010	UH29005-012	UH29005-013	UH31001-004	UH31001-007	UH31001-003	UH29005-017
Sample Date						08/26/2019	08/26/2019	08/26/2019	09/04/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/29/2019	08/30/2019	08/29/2019	08/28/2019
Parameter (µg/L)																		
Acenaphthene	1,300	38	4,200 (S)	NCL	1,600	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	52	ID	3,900 (S)	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acetophenone	1,500	ID	6,100,000 (S)	NCL	5,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Anthracene	43 (S)	ID	43 (S)	NCL	5,300	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Atrazine	3.0 (A)	7.3	NLV	NCL	30	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Benzidine	0.30 (M)	0.30 (M)	NLV	NCL	0.011	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
Benzo[a]anthracene	2.1	ID	NLV	NCL	3.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[a]pyrene	5.0 (A)	ID	NLV	NCL	2.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[b]fluoranthene (3,4-Benzofluoranthene)	1.5 (S,AA)	ID	ID	NCL	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[g,h,i]perylene	1.0 (M)	ID	NLV	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[k]fluoranthene	1.0 (M)	NA	NLV	NCL	250	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Butyl benzyl phthalate	1,200	67	NLV	NCL	1,600	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Caprolactam	5,800	NA	NLV	NCL	30,000	1.3 [BJ]	1.2 [BJ]	2 [B]	4.7 [B]	2.3 [B]	<1.6	2 [B]	2 [B]	1.2 [BJ]	1.8	1.8	1.1 [J]	<1.6
Carbazole	85	10 (M)	NLV	NCL	NCL	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
p-Chloro-m-cresol	150	7.4	NLV	NCL	4,300	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
bis(2-chloroethyl)ether	2.0	1.0 (M)	38,000	NCL	1.4	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Chloronaphthalene	1,800	NA	ID	NCL	2,200	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Chlorophenol	45	18	490,000	NCL	270	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chrysene	1.6 (S)	ID	ID	NCL	2,500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzo[a,h]anthracene	2.0 (M)	ID	NLV	NCL	2.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzofuran	ID	4.0	10,000 (S)	NCL	24	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
3,3'-Dichlorobenzidine	1.1	0.30 (M)	NLV	NCL	13	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
2,4-Dichlorophenol	73	11	NLV	NCL	140	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Diethyl phthalate	5,500	110	NLV	NCL	45,000	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Dimethyl phthalate	73,000	NA	NLV	NCL	NCL	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2,4-Dimethylphenol	370	380	NLV	NCL	1,100	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Di-n-butyl phthalate	880	9.7	NLV	NCL	2,700	<0.8	<0.8	<0.8	0.52 [J]	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
4,6-Dinitro-o-cresol	20 (M)	NA	NLV	NCL	4.5	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
2,4-Dinitrotoluene	7.7	NA	NLV	NCL	24	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Di-n-octyl phthalate	130	ID	NLV	NCL	600	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Azobenzene	23	ID	6,400 (S)	NCL	12	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
bis(2-Ethylhexyl)phthalate	6.0 (A)	14	NLV	NCL	560	0.93 [BJ]	1.2 [BJ]	0.94 [BJ]	0.8 [BJ]	0.97 [BJ]	0.9 [BJ]	1.1 [BJ]	0.83 [BJ]	0.89 [BJ]	1.1 [BJ]	1.2 [BJ]	1.1 [BJ]	1.2 [BJ]
Fluoranthene	210 (S)	1.6	210 (S)	NCL	2,400	0.13 [J]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	880	12	2,000 (S)	NCL	880	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hexachlorobenzene	1.0 (A)	0.2 (M)	440	NCL	0.98	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Hexachlorobutadiene	15	0.053	1,600	NCL	14	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Hexachlorocyclopentadiene	50 (A)	ID	130	NCL	1.2	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Hexachloroethane	7.3	6.7	27,000	NCL	19	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Indeno[1,2,3-cd]pyrene	2.0 (M)	ID	NLV	NCL	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Isophorone	770	1,300	NLV	NCL	7,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Methylnaphthalene	260	19	25,000 (S)	NCL	110	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Methylphenol	NCL	NCL	NCL	NCL	2,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
4-Methylphenol	NCL	NCL	NCL	NCL	5,600	<1.6	<1.6	<1.6	7.5	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Naphthalene	520	11	31,000 (S)	NCL	17	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrobenzene	3.4	180	280,000	NCL	14	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Nitrophenol	20	ID	NLV	NCL	NCL	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
n-Nitroso-di-n-propylamine	5.0 (M)	NA	NLV	NCL	1.1	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
n-Nitrosodiphenylamine	270	NA	NLV	NCL	1,200	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Pentachlorophenol	1.0 (A)	1.8 (G)	NLV	NCL	4.1	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
Phenanthrene	52	2.0 (M)	1,000 (S)	NCL	NCL	0.064 [J]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Phenol	4,400	450	NLV	NCL	17,000	<0.8	<0.8	<0.8	6.2	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Pyrene	140 (S)	ID	140 (S)	NCL	360	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2,4,5-Trichlorophenol	730	NA	NLV	NCL	3,500	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2,4,6-Trichlorophenol	120	5.0	NLV	NCL	36	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8

TABLE 1B
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - SVOCS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-13M	WV-MW-13S	WV-MW-14D	WV-MW-14S	WV-MW-16D	WV-MW-16S	WV-MW-16S
Sample Name						WV-GW-MW13M	WV-GW-MW13S	WV-GW-MW14D	WV-GW-MW14S	WV-GW-MW16D	WV-GW-MW16S	WV-GW-MW16S DUP
Depth Interval (feet below ground surface)						18-23	1.5-6.5	140-145	9-14	91-96	17-22	17-22
Laboratory Sample ID(s)						UH29005-019	UH29005-016	UH29005-018	UH29005-015	UH31001-005	UH31001-001	UH31001-002
Sample Date						08/28/2019	08/28/2019	08/28/2019	08/28/2019	08/29/2019	08/29/2019	08/29/2019
Parameter (µg/L)												
Acenaphthene	1,300	38	4,200 (S)	NCL	1,600	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	52	ID	3,900 (S)	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acetophenone	1,500	ID	6,100,000 (S)	NCL	5,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Anthracene	43 (S)	ID	43 (S)	NCL	5,300	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Atrazine	3.0 (A)	7.3	NLV	NCL	30	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Benzidine	0.30 (M)	0.30 (M)	NLV	NCL	0.011	<20	<20	<20	<20	<20	<20	<20
Benzo[a]anthracene	2.1	ID	NLV	NCL	3.0	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[a]pyrene	5.0 (A)	ID	NLV	NCL	2.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[b]fluoranthene (3,4-Benzofluoranthene)	1.5 (S,AA)	ID	ID	NCL	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[g,h,i]perylene	1.0 (M)	ID	NLV	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo[k]fluoranthene	1.0 (M)	NA	NLV	NCL	250	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Butyl benzyl phthalate	1,200	67	NLV	NCL	1,600	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Caprolactam	5,800	NA	NLV	NCL	30,000	2.3	<1.6	1.1 [J]	2.2	2.8	1.2 [J]	1.9
Carbazole	85	10 (M)	NLV	NCL	NCL	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
p-Chloro-m-cresol	150	7.4	NLV	NCL	4,300	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
bis(2-chloroethyl)ether	2.0	1.0 (M)	38,000	NCL	1.4	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Chloronaphthalene	1,800	NA	ID	NCL	2,200	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Chlorophenol	45	18	490,000	NCL	270	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Chrysene	1.6 (S)	ID	ID	NCL	2,500	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzo[a,h]anthracene	2.0 (M)	ID	NLV	NCL	2.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenzofuran	ID	4.0	10,000 (S)	NCL	24	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
3,3'-Dichlorobenzidine	1.1	0.30 (M)	NLV	NCL	13	<4	<4	<4	<4	<4	<4	<4
2,4-Dichlorophenol	73	11	NLV	NCL	140	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Diethyl phthalate	5,500	110	NLV	NCL	45,000	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Dimethyl phthalate	73,000	NA	NLV	NCL	NCL	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2,4-Dimethylphenol	370	380	NLV	NCL	1,100	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Di-n-butyl phthalate	880	9.7	NLV	NCL	2,700	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
4,6-Dinitro-o-cresol	20 (M)	NA	NLV	NCL	4.5	<4	<4	<4	<4	<4	<4	<4
2,4-Dinitrotoluene	7.7	NA	NLV	NCL	24	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Di-n-octyl phthalate	130	ID	NLV	NCL	600	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Azobenzene	23	ID	6,400 (S)	NCL	12	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
bis(2-Ethylhexyl)phthalate	6.0 (A)	14	NLV	NCL	560	1.4 [BJ]	1.3 [BJ]	3 [BJ]	1.6 [BJ]	1 [BJ]	0.94 [BJ]	1.3 [BJ]
Fluoranthene	210 (S)	1.6	210 (S)	NCL	2,400	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Fluorene	880	12	2,000 (S)	NCL	880	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Hexachlorobenzene	1.0 (A)	0.2 (M)	440	NCL	0.98	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Hexachlorobutadiene	15	0.053	1,600	NCL	14	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Hexachlorocyclopentadiene	50 (A)	ID	130	NCL	1.2	<4	<4	<4	<4	<4	<4	<4
Hexachloroethane	7.3	6.7	27,000	NCL	19	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Indeno[1,2,3-cd]pyrene	2.0 (M)	ID	NLV	NCL	25	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Isophorone	770	1,300	NLV	NCL	7,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Methylnaphthalene	260	19	25,000 (S)	NCL	110	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Methylphenol	NCL	NCL	NCL	NCL	2,800	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
4-Methylphenol	NCL	NCL	NCL	NCL	5,600	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
Naphthalene	520	11	31,000 (S)	NCL	17	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrobenzene	3.4	180	280,000	NCL	14	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2-Nitrophenol	20	ID	NLV	NCL	NCL	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6	<1.6
n-Nitroso-di-n-propylamine	5.0 (M)	NA	NLV	NCL	1.1	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
n-Nitrosodiphenylamine	270	NA	NLV	NCL	1,200	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Pentachlorophenol	1.0 (A)	1.8 (G)	NLV	NCL	4.1	<4	<4	<4	<4	<4	<4	<4
Phenanthrene	52	2.0 (M)	1,000 (S)	NCL	NCL	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Phenol	4,400	450	NLV	NCL	17,000	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Pyrene	140 (S)	ID	140 (S)	NCL	360	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2,4,5-Trichlorophenol	730	NA	NLV	NCL	3,500	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
2,4,6-Trichlorophenol	120	5.0	NLV	NCL	36	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8

TABLE 1C
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - METALS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-1	WV-MW-2D	WV-MW-2S	WV-MW-3D	WV-MW-3S	WV-MW-4	WV-MW-5D	WV-MW-5S	WV-MW-6D	WV-MW-6S	WV-MW-7D	WV-MW-7M	WV-MW-7S
Sample Name						WV-GW-MW1	WV-GW-MW2D	WV-GW-MW2S	WV-GW-MW3D	WV-GW-MW3S	WV-GW-MW4	WV-GW-MW5D	WV-GW-MW5S	WV-GW-MW6D	WV-GW-MW6S	WV-GW-MW 7D	WV-GW-MW 7M	WV-GW-MW 7S
Depth Interval (feet below ground surface)						135-140	25-35	20-25	56-61	5-10	130-135	67-72	60-65	98-103	13-18	15.7-20.5	50-55	90.2-95
Laboratory Sample ID(s)						UI05007-008 & 19090192-01B	UI05007-005 & 19090078-05B	UI05007-004 & 19090078-04B	UI05007-010 & 19090192-03B	UI05007-011 & 19090192-04B	UI05007-002 & 19090078-02B	UI05007-001 & 19090078-01B	UI05007-003 & 19090078-03B	UH29005-021 & 19081811-18B	UH29005-020 & 19081811-17B	UH29005-001 & 19081811-01B	UH29005-003 & 19081811-03B	UH29005-002 & 19081811-02B
Sample Date						09/04/2019	09/03/2019	09/03/2019	09/04/2019	09/04/2019	09/03/2019	09/03/2019	09/03/2019	08/28/2019	08/28/2019	08/26/2019	08/26/2019	08/26/2019
Parameter (µg/L)																		
Aluminum	50 (V)	NA	NLV	NCL	60,000	***140***	50	<40	<40	***510***	***850***	<40	<40	36 [J]	38 [J]	***51***	11 [J]	16 [J]
Antimony	6.0 (A)	130	NLV	NCL	23	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic	10 (A)	10	NLV	NCL	5.2	<2	<2	<2	<2	<2	1.3 [J]	<2	<2	1.4 [J]	<2	<2	<2	<2
Barium	2,000 (A)	1,000 (G)	NLV	NCL	11,000	160	360	43	28	94	86	20	23	84	28	34	43	6.3
Beryllium	4.0 (A)	25 (G)	NLV	NCL	74	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Boron (Boron and Borates only)	500 (F)	7,200	NLV	NCL	12,000	27 [J]	6.6 [J]	33 [J]	20 [J]	17 [J]	45 [J]	34 [J]	31 [J]	14 [J]	18 [J]	42 [J]	57	130
Cadmium	5.0 (A)	2.5 (G)	NLV	NCL	NCL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (Total)	NCL	NCL	NCL	NCL	NCL	1.9 [J]	<5	1.8 [J]	<5	1.8 [J]	2 [J]	<5	<5	1.7 [J]	2.5 [J]	1.6 [J]	1.8 [J]	1.7 [J]
Trivalent Chromium (Calculated: Total - Hexavalent)	100 (A)	120 (G)	NLV	NCL	67,000	1.9	ND	1.8	ND	1.8	2	ND	ND	1.7	2.5	1.6	1.8	NC
Hexavalent Chromium	100 (A)	11	NLV	NCL	3.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5.5
Cobalt	40	100	NLV	NCL	18	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Copper	1,000 (E)	18 (G)	NLV	NCL	2,400	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	1.3 [J]
Iron	300 (E)	NA	NLV	NCL	42,000	***480***	***480***	290	270	***5,200***	***1,500***	300	***330***	***880***	***410***	***710***	***420***	190
Lead	4.0 (L)	14 (G)	NLV	NCL	15	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1
Magnesium	400,000	NA	NLV	NCL	NCL	29,000	12,000	24,000	22,000	6,900	14,000	22,000	26,000	26,000	18,000	23,000	26,000	12,000
Mercury	2.0 (A)	0.0013	56 (S)	1.4	1.9	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum	73	3,200	NLV	NCL	300	<10	7.3 [J]	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Nickel	100 (A)	100 (G)	NLV	NCL	1,200	2 [J]	20	<5	<5	1.8 [J]	1.5 [J]	<5	<5	<5	<5	2 [J]	1.7 [J]	<5
Selenium	50 (A)	5.0	NLV	NCL	300	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	34	0.2 (M)	NLV	NCL	280	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium	NCL	NCL	NCL	NCL	NCL	16,000	29,000	29,000	31,000	11,000	11,000	33,000	44,000	230,000	230,000	45,000	39,000	13,000
Thallium	2.0 (A)	3.7	NLV	NCL	0.60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Titanium	NCL	NCL	NCL	NCL	NCL	4.6 [J]	<5	<5	<5	8.6	17	<5	<5	1.8 [J]	1.5 [J]	5.7	<5	<5
Vanadium	4.5	27	NLV	NCL	260	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Zinc	2,400	230 (G)	NLV	NCL	18,000	4.6 [BJ]	4.1 [BJ]	3.6 [BJ]	5 [BJ]	3.9 [BJ]	6 [BJ]	3.3 [BJ]	4 [BJ]	3.6 [BJ]	4 [BJ]	3.9 [BJ]	5.9 [BJ]	3.4 [BJ]

TABLE 1C
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - METALS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-8D	WV-MW-8M	WV-MW-8S	WV-MW-9	WV-MW-10D	WV-MW-10M	WV-MW-10S	WV-MW-11D	WV-MW-11S	WV-MW-12D	WV-MW-12M	WV-MW-12S	WV-MW-13D
Sample Name						WV-GW-MW 8D	WV-GW-MW 8M	WV-GW-MW 8S	WV-GW-MW9	WV-GW-MW10D	WV-GW-MW10M	WV-GW-MW10S	WV-GW-MW11D	WV-GW-MW11S	WV-GW-MW12D	WV-GW-MW12M	WV-GW-MW12S	WV-GW-MW13D
Depth Interval (feet below ground surface)						115-120	60-65	30-35	92.3-97.3	165-170	70-75	10-15	158.9-163.9	28.8-33.8	176.5-181.5	144.5-149.4	74.6-79.5	58-63
Laboratory Sample ID(s)						UH29005-004 & 19081811-04B	UH29005-005 & 19081811-05B	UH29005-006 & 19081811-06B	UI05007-009 & 19090192-02B	UH29005-011 & 19081811-09B	UH29005-009 & 19081811-07B	UH29005-010 & 19081811-08B	UH29005-012 & 19081811-10B	UH29005-013 & 19081811-11B	UH31001-004 & 19081811-22B	UH31001-007 & 19081811-24B	UH31001-003 & 19081811-21B	UH29005-017 & 19081811-14B
Sample Date						08/26/2019	08/26/2019	08/26/2019	09/04/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/29/2019	08/30/2019	08/29/2019	08/28/2019
Parameter (µg/L)																		
Aluminum	50 (V)	NA	NLV	NCL	60,000	***76***	20 [J]	12 [J]	***770***	<40	28 [J]	48	***460***	<40	***5,900***	***60***	27 [J]	<40
Antimony	6.0 (A)	130	NLV	NCL	23	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Arsenic	10 (A)	10	NLV	NCL	5.2	5	<2	<2	2.2	<2	<2	<2	<2	<2	<10	7	<2	<2
Barium	2,000 (A)	1,000 (G)	NLV	NCL	11,000	60	94	20	73	210	150	30	56	40	83	110	88	54
Beryllium	4.0 (A)	25 (G)	NLV	NCL	74	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<2	<0.4	<0.4	<0.4
Boron (Boron and Borates only)	500 (F)	7,200	NLV	NCL	12,000	42 [J]	38 [J]	23 [J]	29 [J]	8.5 [J]	21 [J]	43 [J]	29 [J]	23 [J]	410	180	31 [J]	18 [J]
Cadmium	5.0 (A)	2.5 (G)	NLV	NCL	NCL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (Total)	NCL	NCL	NCL	NCL	NCL	2.1 [J]	3.6 [J]	2.5 [J]	4.1 [J]	1.8 [J]	1.9 [J]	1.6 [J]	2.3 [J]	1.8 [J]	20 [J]	<5	<5	1.9 [J]
Trivalent Chromium (Calculated: Total - Hexavalent)	100 (A)	120 (G)	NLV	NCL	67,000	2.1	3.6	2.5	4.1	1.8	1.9	1.6	2.3	1.8	20	NC	ND	1.9
Hexavalent Chromium	100 (A)	11	NLV	NCL	3.5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	6.8	<5	<5
Cobalt	40	100	NLV	NCL	18	<5	<5	<5	<5	<5	<5	<5	<5	<5	<25	<5	<5	<5
Copper	1,000 (E)	18 (G)	NLV	NCL	2,400	<5	<5	<5	<5	<5	<5	<5	<5	<5	13 [J]	<5	<5	<5
Iron	300 (E)	NA	NLV	NCL	42,000	***770***	***750***	***480***	***1,900***	***1,100***	***620***	***450***	***1,700***	***380***	***19,000***	***840***	***1,200***	***570***
Lead	4.0 (L)	14 (G)	NLV	NCL	15	<1	<1	<1	0.4 [J]	<1	<1	<1	<1	<1	***4.1***	<1	<1	<1
Magnesium	400,000	NA	NLV	NCL	NCL	19,000	49,000	30,000	32,000	24,000	15,000	25,000	17,000	25,000	45,000	14,000	24,000	32,000
Mercury	2.0 (A)	0.0013	56 (S)	1.4	1.9	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum	73	3,200	NLV	NCL	300	4.2 [J]	<10	<10	9.1 [J]	<10	<10	<10	<10	<10	<10	2.7 [J]	<10	<10
Nickel	100 (A)	100 (G)	NLV	NCL	1,200	1.6 [J]	2.5 [J]	1.6 [J]	1.8 [J]	1.3 [J]	<5	1.8 [J]	1.7 [J]	1.4 [J]	16 [J]	1.9 [J]	<5	1.6 [J]
Selenium	50 (A)	5.0	NLV	NCL	300	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Silver	34	0.2 (M)	NLV	NCL	280	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sodium	NCL	NCL	NCL	NCL	NCL	15,000	300,000	110,000	9,800	12,000	6,300	69,000	6,000	22,000	21,000	9,400	5,300	120,000
Thallium	2.0 (A)	3.7	NLV	NCL	0.60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Titanium	NCL	NCL	NCL	NCL	NCL	3.1 [J]	1.5 [J]	<5	24	<5	3.1 [J]	2 [J]	13	<5	200	3.6 [J]	1.8 [J]	<5
Vanadium	4.5	27	NLV	NCL	260	<5	<5	<5	<5	<5	<5	<5	<5	<5	***15 [J]***	<5	<5	<5
Zinc	2,400	230 (G)	NLV	NCL	18,000	4.1 [BJ]	3.9 [BJ]	4.7 [BJ]	5.3 [BJ]	7.4 [BJ]	3.1 [BJ]	3.4 [BJ]	4.3 [BJ]	4.3 [BJ]	32 [B]	3.3 [BJ]	3.2 [BJ]	4.1 [BJ]

TABLE 1C
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - METALS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-13M	WV-MW-13S	WV-MW-14D	WV-MW-14S	WV-MW-16D	WV-MW-16S	WV-MW-16S
Sample Name						WV-GW-MW13M	WV-GW-MW13S	WV-GW-MW14D	WV-GW-MW14S	WV-GW-MW16D	WV-GW-MW16S	WV-GW-MW16S DUP
Depth Interval (feet below ground surface)						18-23	1.5-6.5	140-145	9-14	91-96	17-22	17-22
Laboratory Sample ID(s)						UH29005-019 & 19081811-16B	UH29005-016 & 19081811-13B	UH29005-018 & 19081811-15B	UH29005-015 & 19081811-12B	UH31001-005 & 19081811-23B	UH31001-001 & 19081811-19B	UH31001-002 & 19081811-20B
Sample Date						08/28/2019	08/28/2019	08/28/2019	08/28/2019	08/29/2019	08/29/2019	08/29/2019
Parameter (µg/L)												
Aluminum	50 (V)	NA	NLV	NCL	60,000	27 [J]	34 [J]	42	<40	***310***	<40	<40
Antimony	6.0 (A)	130	NLV	NCL	23	<2	<2	<2	<2	<2	<2	<2
Arsenic	10 (A)	10	NLV	NCL	5.2	9.7	<2	<2	<2	3.5	<2	<2
Barium	2,000 (A)	1,000 (G)	NLV	NCL	11,000	56	42	100	42	87	46	47
Beryllium	4.0 (A)	25 (G)	NLV	NCL	74	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Boron (Boron and Borates only)	500 (F)	7,200	NLV	NCL	12,000	28 [J]	76	29 [J]	14 [J]	180	130	130
Cadmium	5.0 (A)	2.5 (G)	NLV	NCL	NCL	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (Total)	NCL	NCL	NCL	NCL	NCL	1.8 [J]	2.3 [J]	1.8 [J]	2.3 [J]	<5	<5	<5
Trivalent Chromium (Calculated: Total - Hexavalent)	100 (A)	120 (G)	NLV	NCL	67,000	1.8	2.3	1.8	2.3	ND	ND	ND
Hexavalent Chromium	100 (A)	11	NLV	NCL	3.5	<5	<5	<5	<5	<5	<5	<5
Cobalt	40	100	NLV	NCL	18	1.4 [J]	<5	<5	<5	<5	<5	<5
Copper	1,000 (E)	18 (G)	NLV	NCL	2,400	<5	<5	<5	<5	<5	<5	<5
Iron	300 (E)	NA	NLV	NCL	42,000	***13,000***	***15,000***	***630***	***500***	***3,100***	***350***	***320***
Lead	4.0 (L)	14 (G)	NLV	NCL	15	<1	<1	<1	<1	<1	<1	<1
Magnesium	400,000	NA	NLV	NCL	NCL	20,000	19,000	22,000	35,000	27,000	32,000	32,000
Mercury	2.0 (A)	0.0013	56 (S)	1.4	1.9	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum	73	3,200	NLV	NCL	300	<10	<10	5.4 [J]	<10	6.3 [J]	<10	<10
Nickel	100 (A)	100 (G)	NLV	NCL	1,200	2.6 [J]	1.4 [J]	1.6 [J]	1.5 [J]	<5	6.4	6.4
Selenium	50 (A)	5.0	NLV	NCL	300	<5	<5	<5	<5	<5	<5	<5
Silver	34	0.2 (M)	NLV	NCL	280	<1	<1	<1	<1	<1	<1	<1
Sodium	NCL	NCL	NCL	NCL	NCL	67,000	17,000	9,300	12,000	18,000	30,000	30,000
Thallium	2.0 (A)	3.7	NLV	NCL	0.60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Titanium	NCL	NCL	NCL	NCL	NCL	3.4 [J]	3.1 [J]	2.8 [J]	<5	9.8	<5	<5
Vanadium	4.5	27	NLV	NCL	260	<5	***7.6***	<5	<5	<5	<5	<5
Zinc	2,400	230 (G)	NLV	NCL	18,000	33 [B]	3.3 [BJ]	3.8 [BJ]	3.4 [BJ]	3 [BJ]	3.4 [BJ]	3 [BJ]

TABLE 1D
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - INORGANICS/GENERAL CHEMISTRY
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-1	WV-MW-2D	WV-MW-2S	WV-MW-3D	WV-MW-3S	WV-MW-4	WV-MW-5D	WV-MW-5S	WV-MW-6D	WV-MW-6S	WV-MW-7D	WV-MW-7M	WV-MW-7S
Sample Name						WV-GW-MW1	WV-GW-MW2D	WV-GW-MW2S	WV-GW-MW3D	WV-GW-MW3S	WV-GW-MW4	WV-GW-MW5D	WV-GW-MW5S	WV-GW-MW6D	WV-GW-MW6S	WV-GW-MW 7D	WV-GW-MW 7M	WV-GW-MW 7S
Depth Interval (feet below ground surface)						135-140	25-35	20-25	56-61	5-10	130-135	67-72	60-65	98-103	13-18	15.7-20.5	50-55	90.2-95
Laboratory Sample ID(s)						UI05007-008 & 19090192-01A/C	UI05007-005 & 19090078-05A/C	UI05007-004 & 19090078-04A/C	UI05007-010 & 19090192-03A/C	UI05007-011 & 19090192-04A/C	UI05007-002 & 19090078-02A/C	UI05007-001 & 19090078-01A/C	UI05007-003 & 19090078-03A/C	UH29005-021 & 19081811-18A/C	UH29005-020 & 19081811-17A/C	UH29005-001 & 19081811-01A/C	UH29005-003 & 19081811-03A/C	UH29005-002 & 19081811-02A/C
Sample Date						09/04/2019	09/03/2019	09/03/2019	09/04/2019	09/04/2019	09/03/2019	09/03/2019	09/03/2019	08/28/2019	08/28/2019	08/26/2019	08/26/2019	08/26/2019
Parameter (µg/L)																		
Acetic Acid	4,200	8,800 (G)	NLV	NCL	NCL	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000
Formic acid	10,000	ID	7,700,000	NCL	1.9	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000
Cyanide - Total	200	5.2	NLV	NCL	4.4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cyanide, Available	200 (A)	5.2	NLV	NCL	NCL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Hardness (total)	NCL	NCL	NCL	NCL	NCL	370,000	370,000	330,000	300,000	86,000	200,000	320,000	360,000	310,000	260,000	290,000	300,000	140,000
Ammonia - N (gas diffusion)	NCL	NCL	NCL	NCL	NCL	<100	1,300	<100	760	2,200	550	<100	<100	<100	<100	<100	<100	<100
Nitrate-Nitrite - N	NCL	NCL	NCL	NCL	NCL	4,200	120	4,600	2,200	<20	<20	5,700	5,600	<20	2,500	540	1,400	17,000
Nitrate-Nitrite - N + Ammonia - N (Calculated)	10,000 (N)	NCL	NCL	NCL	NCL	4,200	1,400	4,600	3,000	2,200	550	5,700	5,600	ND	2,500	540	1,400	***17,000***
Unionized Ammonia (Calculated based on pH 8.0, 20°C)	NCL	29 (CC)	NCL	250,000	NCL	ND	***50***	ND	29	***84***	21	ND	ND	ND	ND	ND	ND	ND
Chloride	250,000 (E)	NCL (FF)	NLV	NCL	NCL	34,000	78,000	61,000	69,000	43,000	3,600	60,000	63,000	***320,000***	***350,000***	91,000	87,000	7,500
Phosphorus (Total)	63,000	1,000 (EE)	NLV	NCL	NCL	<50	<50	<50	<50	110	120	28 [J]	47 [J]	20 [J]	<50	<50	<50	23 [J]
Sulfate	250,000 (E)	NA	NLV	NCL	NCL	34,000	32,000	12,000	26,000	<1,000	11,000	12,000	14,000	17,000	18,000	18,000	13,000	11,000
Sulfide	NCL	NCL	NCL	NCL	NCL	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000

TABLE 1D
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - INORGANICS/GENERAL CHEMISTRY
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-8D	WV-MW-8M	WV-MW-8S	WV-MW-9	WV-MW-10D	WV-MW-10M	WV-MW-10S	WV-MW-11D	WV-MW-11S	WV-MW-12D	WV-MW-12M	WV-MW-12S	WV-MW-13D
Sample Name						WV-GW-MW 8D	WV-GW-MW 8M	WV-GW-MW 8S	WV-GW-MW9	WV-GW-MW10D	WV-GW-MW10M	WV-GW-MW10S	WV-GW-MW11D	WV-GW-MW11S	WV-GW-MW12D	WV-GW-MW12M	WV-GW-MW12S	WV-GW-MW13D
Depth Interval (feet below ground surface)						115-120	60-65	30-35	92.3-97.3	165-170	70-75	10-15	158.9-163.9	28.8-33.8	176.5-181.5	144.5-149.4	74.6-79.5	58-63
Laboratory Sample ID(s)						UH29005-004 & 19081811-04A/C	UH29005-005 & 19081811-05A/C	UH29005-006 & 19081811-06A/C	UI05007-009 & 19090192-02A/C	UH29005-011 & 19081811-09A/C	UH29005-009 & 19081811-07A/C	UH29005-010 & 19081811-08A/C	UH29005-012 & 19081811-10A/C	UH29005-013 & 19081811-11A/C	UH31001-004 & 19081811-22A/C	UH31001-007 & 19081811-24A/C	UH31001-003 & 19081811-21A/C	UH29005-017 & 19081811-14A/C
Sample Date						08/26/2019	08/26/2019	08/26/2019	09/04/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/29/2019	08/30/2019	08/29/2019	08/28/2019
Parameter (µg/L)																		
Acetic Acid	4,200	8,800 (G)	NLV	NCL	NCL	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000
Formic acid	10,000	ID	7,700,000	NCL	1.9	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000
Cyanide - Total	200	5.2	NLV	NCL	4.4	<10	<10	<10	<10	<10	<10	<10	<10	<10	<20	<10	<10	<10
Cyanide, Available	200 (A)	5.2	NLV	NCL	NCL	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Hardness (total)	NCL	NCL	NCL	NCL	NCL	270,000	200,000	390,000	320,000	290,000	190,000	300,000	330,000	300,000	1,900,000	510,000	400,000	420,000
Ammonia - N (gas diffusion)	NCL	NCL	NCL	NCL	NCL	780	<100	<100	220	<100	130	<100	66 [J]	<100	680 [B]	650 [B]	150 [B]	<100
Nitrate-Nitrite - N	NCL	NCL	NCL	NCL	NCL	390	9,400	6,600	51	26	<20	490	<20	770	17 [J]	<20	<20	1,700
Nitrate-Nitrite - N + Ammonia - N (Calculated)	10,000 (N)	NCL	NCL	NCL	NCL	1,200	9,400	6,600	270	26	130	490	66	770	700	650	150	1,700
Unionized Ammonia (Calculated based on pH 8.0, 20°C)	NCL	29 (CC)	NCL	250,000	NCL	***30***	ND	ND	8.4	ND	5.0	ND	2.5	ND	26	25	5.7	ND
Chloride	250,000 (E)	NCL (FF)	NLV	NCL	NCL	44,000	***560,000***	230,000	7,800	42,000	1,500	120,000	31,000	39,000	31,000	7,000	6,800	250,000
Phosphorus (Total)	63,000	1,000 (EE)	NLV	NCL	NCL	55	<50	<50	48 [J]	<50	24 [J]	<50	23 [J]	<50	250	28 [J]	<50	<50
Sulfate	250,000 (E)	NA	NLV	NCL	NCL	27,000	110,000	11,000	29,000	36,000	12,000	10,000	92,000	13,000	***1,400,000***	***350,000***	25,000	23,000
Sulfide	NCL	NCL	NCL	NCL	NCL	<1,000	<1,000	<1,000	<1,000	1,900	1,200	<1,000	2,100	<1,000	<1,000	<1,000	<1,000	<1,000

TABLE 1D
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - INORGANICS/GENERAL CHEMISTRY
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Level - Groundwater[3]	U.S. EPA Residential Tap Water Regional Removal Management Levels[4]	WV-MW-13M	WV-MW-13S	WV-MW-14D	WV-MW-14S	WV-MW-16D	WV-MW-16S	WV-MW-16S
Sample Name						WV-GW-MW13M	WV-GW-MW13S	WV-GW-MW14D	WV-GW-MW14S	WV-GW-MW16D	WV-GW-MW16S	WV-GW-MW16S DUP
Depth Interval (feet below ground surface)						18-23	1.5-6.5	140-145	9-14	91-96	17-22	17-22
Laboratory Sample ID(s)						UH29005-019 & 19081811-16A/C	UH29005-016 & 19081811-13A/C	UH29005-018 & 19081811-15A/C	UH29005-015 & 19081811-12A/C	UH31001-005 & 19081811-23A/C	UH31001-001 & 19081811-19A/C	UH31001-002 & 19081811-20A/C
Sample Date						08/28/2019	08/28/2019	08/28/2019	08/28/2019	08/29/2019	08/29/2019	08/29/2019
Parameter (µg/L)												
Acetic Acid	4,200	8,800 (G)	NLV	NCL	NCL	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000
Formic acid	10,000	ID	7,700,000	NCL	1.9	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000	<25,000
Cyanide - Total	200	5.2	NLV	NCL	4.4	<10	<10	<10	<10	<10	<10	<10
Cyanide, Available	200 (A)	5.2	NLV	NCL	NCL	<2	<2	<2	<2	<2	<2	<2
Hardness (total)	NCL	NCL	NCL	NCL	NCL	350,000	360,000	260,000	440,000	310,000	420,000	400,000
Ammonia - N (gas diffusion)	NCL	NCL	NCL	NCL	NCL	410	1,300	<100	<100	620 [B]	71 [J]	85 [J]
Nitrate-Nitrite - N	NCL	NCL	NCL	NCL	NCL	44	29	<20	420	<20	240	390
Nitrate-Nitrite - N + Ammonia - N (Calculated)	10,000 (N)	NCL	NCL	NCL	NCL	450	1,300	ND	420	620	310	480
Unionized Ammonia (Calculated based on pH 8.0, 20°C)	NCL	29 (CC)	NCL	250,000	NCL	16	***50***	ND	ND	24	2.7	3.2
Chloride	250,000 (E)	NCL (FF)	NLV	NCL	NCL	120,000	63,000	13,000	20,000	2,600	62,000	61,000
Phosphorus (Total)	63,000	1,000 (EE)	NLV	NCL	NCL	<50	57	<50	<50	34 [J]	<50	<50
Sulfate	250,000 (E)	NA	NLV	NCL	NCL	4,400	12,000	21,000	24,000	<5,000	15,000	14,000
Sulfide	NCL	NCL	NCL	NCL	NCL	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	

TABLE 1E
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - PFAS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	U.S. EPA Residential Tap Water Regional Removal Management Levels[3]	WV-MW-1	WV-MW-2D	WV-MW-2S	WV-MW-3D	WV-MW-3S	WV-MW-4	WV-MW-5D	WV-MW-5S	WV-MW-6D	WV-MW-6S	WV-MW-7D	WV-MW-7M	WV-MW-7S
Sample Name					WV-GW-MW1	WV-GW-MW2D	WV-GW-MW2S	WV-GW-MW3D	WV-GW-MW3S	WV-GW-MW4	WV-GW-MW5D	WV-GW-MW5S	WV-GW-MW6D	WV-GW-MW6S	WV-GW-MW 7D	WV-GW-MW 7M	WV-GW-MW 7S
Depth Interval (feet below ground surface)					135-140	25-35	20-25	56-61	5-10	130-135	67-72	60-65	98-103	13-18	15.7-20.5	50-55	90.2-95
Laboratory Sample ID(s)					UI05007-008	UI05007-005	UI05007-004	UI05007-010	UI05007-011	UI05007-002	UI05007-001	UI05007-003	UH29005-021	UH29005-020	UH29005-001	UH29005-003	UH29005-002
Sample Date					09/04/2019	09/03/2019	09/03/2019	09/04/2019	09/04/2019	09/03/2019	09/03/2019	09/03/2019	08/28/2019	08/28/2019	08/26/2019	08/26/2019	08/26/2019
Parameter (µg/L)																	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	<0.0067	<0.0072	<0.0071	<0.0073	<0.0071	<0.0069	<0.0069	<0.007	<0.0067	<0.0069	<0.0071	<0.007	<0.0068
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	1,200	0.048	0.045	0.016	0.006	0.0082	<0.0035	0.0086	0.0087	0.017	0.0086	0.011	0.01	<0.0034
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	0.25	0.022	0.054	<0.0037	0.0041	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	0.013	0.011	<0.0034
Perfluoro-1-nonanesulfonate (PFNS)	NCL	NCL	NCL	NCL	<0.0067	<0.0072	<0.0071	<0.0073	<0.0071	<0.0069	<0.0069	<0.007	<0.0067	<0.0069	<0.0071	<0.007	<0.0068
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Perfluoro-1-pentanesulfonate (PFPeS)	NCL	NCL	NCL	NCL	0.14	0.13	0.02	<0.0037	0.0074	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	0.0069	0.0053	<0.0034
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	1.1	0.26	0.065	0.004	0.024	<0.0035	0.0037	0.004	<0.0033	<0.0034	0.034	0.022	0.0065
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	0.037	0.017	0.0096	<0.0037	0.0097	<0.0035	0.0041	<0.0035	0.0055	0.0036	0.0055	0.0043	0.028
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	0.26	0.12	0.032	<0.0037	0.014	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	0.011	0.0078	0.016
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	0.11	0.055	0.017	<0.0037	0.0083	<0.0035	0.0051	<0.0035	<0.0033	<0.0034	0.0095	0.0061	0.028
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	0.017	<0.0036	0.0071	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	***4.3***	***0.89***	***0.32***	0.0019	***0.099***	<0.0017	0.0082	0.0061	0.0034	0.0066	***0.12***	***0.077***	0.026
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	***10***	***0.15***	***3.8***	<0.0037	***0.15***	<0.0035	<0.0034	<0.0035	<0.0033	0.0066	***0.2***	***0.28***	<0.0034
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	***14***	***1.0***	***4.1***	0.0019	***0.25***	ND	0.0082	0.0061	0.0034	0.013	***0.32***	***0.36***	0.026
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	0.037	0.025	0.0089	<0.0037	0.0049	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	0.005	0.0039	0.031
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0035	<0.0034	<0.0035	<0.0033	<0.0034	<0.0036	<0.0035	<0.0034
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	16	1.7	4.3	0.012	0.33	ND	0.03	0.019	0.026	0.025	0.42	0.43	0.14

TABLE 1E
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - PFAS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	U.S. EPA Residential Tap Water Regional Removal Management Levels[3]	WV-MW-8D	WV-MW-8M	WV-MW-8S	WV-MW-9	WV-MW-10D	WV-MW-10M	WV-MW-10S	WV-MW-11D	WV-MW-11S	WV-MW-12D	WV-MW-12M	WV-MW-12S	WV-MW-13D
Sample Name					WV-GW-MW 8D	WV-GW-MW 8M	WV-GW-MW 8S	WV-GW-MW9	WV-GW-MW10D	WV-GW-MW10M	WV-GW-MW10S	WV-GW-MW11D	WV-GW-MW11S	WV-GW-MW12D	WV-GW-MW12M	WV-GW-MW12S	WV-GW-MW13D
Depth Interval (feet below ground surface)					115-120	60-65	30-35	92.3-97.3	165-170	70-75	10-15	158.9-163.9	28.8-33.8	176.5-181.5	144.5-149.4	74.6-79.5	58-63
Laboratory Sample ID(s)					UH29005-004	UH29005-005	UH29005-006	UI05007-009	UH29005-011	UH29005-009	UH29005-010	UH29005-012	UH29005-013	UH31001-004	UH31001-007	UH31001-003	UH29005-017
Sample Date					08/26/2019	08/26/2019	08/26/2019	09/04/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/27/2019	08/29/2019	08/30/2019	08/29/2019	08/28/2019
Parameter (µg/L)																	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	<0.0069	<0.0071	<0.0068	<0.0075	<0.0071	<0.0072	<0.0071	<0.0081	<0.0071	<0.007	<0.0068	<0.0072	<0.0073
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	1,200	0.0034	0.092	0.015	0.014	0.0042	<0.0036	0.013	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	0.01
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	0.047	<0.0036	<0.0036	0.014	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluoro-1-nonanesulfonate (PFNS)	NCL	NCL	NCL	NCL	<0.0069	<0.0071	<0.0068	<0.0075	<0.0071	<0.0072	<0.0071	<0.0081	<0.0071	<0.007	<0.0068	<0.0072	<0.0073
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	0.025	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluoro-1-pentanesulfonate (PFPeS)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	0.0037	0.039	<0.0036	<0.0036	0.006	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	<0.0034	0.011	0.017	0.18	<0.0036	<0.0036	0.029	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	<0.0034	0.011	0.0061	0.0099	<0.0036	<0.0036	0.01	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	<0.0034	0.0055	0.0054	0.062	<0.0036	<0.0036	0.012	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	<0.0034	0.012	0.004	0.03	<0.0036	<0.0036	0.013	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	0.0052	0.033	0.066	***0.73***	0.0029	<0.0018	***0.11***	<0.002	<0.0018	<0.0017	<0.0017	<0.0018	0.0031
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	<0.0034	0.0052	***0.042***	***0.47***	<0.0036	<0.0036	***1***	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	0.0052	0.038	***0.11***	***1.2***	0.0029	ND	***1.1***	ND	ND	ND	ND	ND	0.0031
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	<0.0034	0.0096	<0.0034	0.01	<0.0036	<0.0036	0.0092	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0036	<0.0036	<0.0035	<0.004	<0.0036	<0.0035	<0.0034	<0.0036	<0.0036
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	0.0086	0.18	0.16	1.6	0.0071	ND	1.2	ND	ND	ND	ND	ND	0.013

TABLE 1E
SUMMARY OF Q3 2019 GROUNDWATER SAMPLE ANALYSIS - PFAS
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

Sample Location	Part 201 Generic Residential Groundwater Cleanup Criteria – Drinking Water[2]	Part 201 Generic Groundwater Cleanup Criteria – Groundwater Surface Water Interface[2]	Part 201 Generic Residential Groundwater Cleanup Criteria – Groundwater Volatilization to Indoor Air Inhalation[2]	U.S. EPA Residential Tap Water Regional Removal Management Levels[3]	WV-MW-13M	WV-MW-13S	WV-MW-14D	WV-MW-14S	WV-MW-16D	WV-MW-16S	WV-MW-16S
Sample Name					WV-GW-MW13M	WV-GW-MW13S	WV-GW-MW14D	WV-GW-MW14S	WV-GW-MW16D	WV-GW-MW16S	WV-GW-MW16S DUP
Depth Interval (feet below ground surface)					18-23	1.5-6.5	140-145	9-14	91-96	17-22	17-22
Laboratory Sample ID(s)					UH29005-019	UH29005-016	UH29005-018	UH29005-015	UH31001-005	UH31001-001	UH31001-002
Sample Date					08/28/2019	08/28/2019	08/28/2019	08/28/2019	08/29/2019	08/29/2019	08/29/2019
Parameter (µg/L)											
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	<0.0072	<0.0072	<0.0068	<0.0068	<0.0072	<0.007	<0.0074
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	1,200	0.0047	<0.0036	0.029	0.015	<0.0036	0.016	0.018
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	0.0035	<0.0034	<0.0036	<0.0035	<0.0037
Perfluoro-1-nonanesulfonate (PFNS)	NCL	NCL	NCL	NCL	<0.0072	<0.0072	<0.0068	<0.0068	<0.0072	<0.007	<0.0074
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Perfluoro-1-pentanesulfonate (PFPeS)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	0.064	<0.0034	<0.0036	<0.0035	0.004
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	0.0048	<0.0036	0.17	0.0085	<0.0036	0.0068	0.007
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	0.0066	0.0076	0.011	<0.0034	<0.0036	0.028	0.029
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	0.083	<0.0034	<0.0036	0.0076	0.0085
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	0.033	<0.0034	<0.0036	0.023	0.023
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	0.016	0.014	***0.54***	0.0065	<0.0018	0.026	0.029
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	***0.017***	***0.041***	0.007	<0.0034	<0.0036	***0.023***	***0.025***
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	0.033	0.055	***0.55***	0.0065	ND	0.049	0.054
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	0.012	<0.0034	<0.0036	0.0097	0.011
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	<0.0036	<0.0036	<0.0034	<0.0034	<0.0036	<0.0035	<0.0037
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	0.049	0.063	0.95	0.03	ND	0.14	0.15

TABLES 1A TO 1E NOTES
Wolven-Jewell Area
Algoma Twp, Kent Co, MI

NOTES:

1. Concentration and criteria units are micrograms per Liter (µg/L) or parts per billion (ppb). Calculated criteria and concentrations are rounded to two significant digits. "ND" indicates the parameters used in the calculation were not detected. "NC" indicates not calculated. Blank indicates the parameter was not analyzed.
2. Michigan Part 201 Groundwater Cleanup Criteria are based on "Table 1, Groundwater: Residential and Nonresidential Part 201 Generic Cleanup Criteria and Screening Levels/Part 213 Tier I Risk Based Screening Levels," Michigan Administrative Code, Cleanup Criteria Requirements for Response Activity, Rules 299.44 and 299.49, effective December 30, 2013; updated June 25, 2018.
   Abbreviations Include:
   "ID" indicates insufficient data to develop criterion.
   "NA" indicates a criterion or value is not available or, in the case of background, not applicable.
   "NCL" indicates no criterion listed in EGLE Table 1.
   "NLV" indicates the substance is not likely to volatilize under most conditions.
   Footnotes Include:
   (A) - The criterion is the State of Michigan drinking water standard.
   (D) - The calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 ppb.
   (E) - Criterion is the aesthetic drinking water value.
   (F) - Criterion is based on adverse impacts to plant life and phytotoxicity.
   (G) - Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water.
   EGLE's Footnote (G) GSI/GSIPC Calculation spreadsheet was utilized to calculate GSI criterion presented. The Rogue River is the receiving surface water for the Site. Hardness (220 mg $CaCO_3$/L) and pH (7.5 standard units) used in the calculations were the lowest (most-conservative) of the calculated mean and median of the Rogue River surface water samples collected in Rockford, MI at the former tannery (TA-SW-01, TA-SW-02, TA-SW-03, TA-SW-05, and TA-SW-07) rounded to two significant digits and water hardness or pH for the Rogue River near Rockford published in United States Geological Survey Circular 323, "Water Resources of the Grand Rapids Area, Michigan," Table 1, 1954.
   (L) - Criteria for lead are derived using a biologically based model. The generic residential drinking water criterion of 4 µg/L is linked to the generic residential soil direct contact criterion of 400 mg/kg.
   (M) - Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.
   (N) - The concentrations of all potential sources of nitrate-nitrogen (e.g., ammonia-N, nitrite-N, nitrate-N) in groundwater that is used as a source of drinking water shall not, when added together, exceed the nitrate drinking water criterion of 10,000 ug/L.
   (P) - Amenable cyanide methods or method OIA-1677 shall be used to quantify cyanide concentrations for compliance with all groundwater criteria.
   (S) - Criterion defaults to the hazardous substance-specific water solubility limit.
   (V) - Criterion is the aesthetic drinking water value.
   (W) - Concentrations of trihalomethanes in groundwater shall be added together to determine compliance with the Michigan drinking water standard of 80 µg/L.
   (AA) - Use 10,000 µg/L where groundwater enters a structure through the use of a water well, sump or other device. Use 28,000 µg/L for all other uses.
   (CC) - The generic GSI criteria are based on the toxicity of unionized ammonia (NH_3); the criteria are 29 µg/L and 53 µg/L for cold water and warm water surface water, respectively. As a result, the GSI criterion shall be compared to the percent of the total ammonia concentration in the groundwater that will become NH_3 in the surface water. This percent NH_3 is a function of the pH and temperature of the receiving surface water and was estimated using the table of this footnote titled "Percent NH_3 in Aqueous Ammonia Solutions for 0-30°C and pH 6-10." This approach uses a default temperature of 68°F and 85°F for cold water and warm water surface water, respectively. The percent conversion factor in the table for cold water (20°C or 68°F) and pH (8.0 standard units) is 3.82%.
   (EE) - The applicable GSI criteria for phosphorus is 1,000 µg/L.
   (FF) - The chloride GSI criteria shall not apply for surface waters of the state that are not designated as a public water supply source.
   (JJ) - Compliance with the drinking water criteria shall require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of 0.07 µg/L.
3. EGLE Residential Recommended Volatilization to Indoor Air Interim Action Screening Levels (RIASLs) for shallow groundwater were based on EGLE's Toxics Steering Group's "Media-Specific Interim Action Screening Levels," published in August 2017. The EGLE published the RIASLs in August 2017, and recently removed the RIASLs from the EGLEwebsite. The EGLE is reportedly evaluating the RIASLs for appropriate use and applicability. These are included for reference.
   Abbreviations Include:
   "NCL" indicates no value listed in the Media-Specific Interim Action Screening Levels table.
   Footnotes Include:
   (M) - Site-specific criterion may be below target detection limits (TDL).
4. U.S. EPA Residential Tap Water Regional Removal Management Levels (RMLs) were based on "Generic RML Tables," updated November 2018.
5. Bold, italic number with thick line border or italic parameter name indicates that parameter was detected above the Michigan Part 201 Groundwater Cleanup Criteria or Media-Specific Interim Action Screening Levels. U.S. EPA RMLs are provided for reference only and results detected above the EPA RMLs are not bolded or italicized.
6. Abbreviations include:
   "< RL" indicates the parameter was analyzed for but not detected above the method detection limit; RL = Reporting Limit.
   "DUP" indicates a duplicate sample.
   "B" indicates the parameter was also detected in the method blank.
   "J" indicates the parameter was detected at a concentration greater than the limit of quantitation (LOQ) but less than the detection limit (DL) and the result is estimated.
7. Sample names presented are from Shealy Environmental Services, Inc. laboratory reports unless the only laboratory analyzing samples was ALS Environmental. Sample names presented in ALS Environmental lab reports may have minor differences based on laboratory interpretation of the chains of custody.