Rose & Westra
A Division of GZA

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Water
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MEMORANDUM

To: Abby Hendershott, EGLE

From: Lori Powers, Rose & Westra, a Division of GZA GeoEnvironmental, Inc.

Date: January 6, 2020

File No.: 16.0062335.52 / 16.0062335.53

Re: Wolverine World Wide, Inc. (Wolverine) – House Street Disposal Area Monthly Progress Report

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This EGLE Monthly Progress Report (MPR) is being submitted on behalf of Wolverine. This EGLE MPR is completed as agreed upon in Mr. John Byl's July 9, 2018 letter entitled *Response to May 29 Correspondence regarding Tannery Meeting Summary and Action Items.*

This progress report also includes information to supplement the December 11, 2019 U.S. EPA MPR (attached).

SITE INVESTIGATION ACTIONS

Continued effort for access to off-site drilling locations.

Location PMW-13 was drilled to depth (bedrock). One deep well was set. Additional wells are to be installed in January 2020.

On-Site capping tasks began. These are further detailed in the U.S. EPA MPRs.

SITE ANALYTICAL DATA RECIEVED

PFAS data received since the last update is summarized on the attached table. This is limited to vertical aquifer profiling from location PMW-13 and portions of the Quarter 4 groundwater monitoring.

SITE MAPPING

A revised RI map is attached.

SITE ANTICIPATED ACTIONS AND SCHEDULE FOR NEXT REPORTING PERIOD

R&W/GZA will continue to make efforts to gain access to locations PMW-22 and PMW-16 for possible additional well installation.

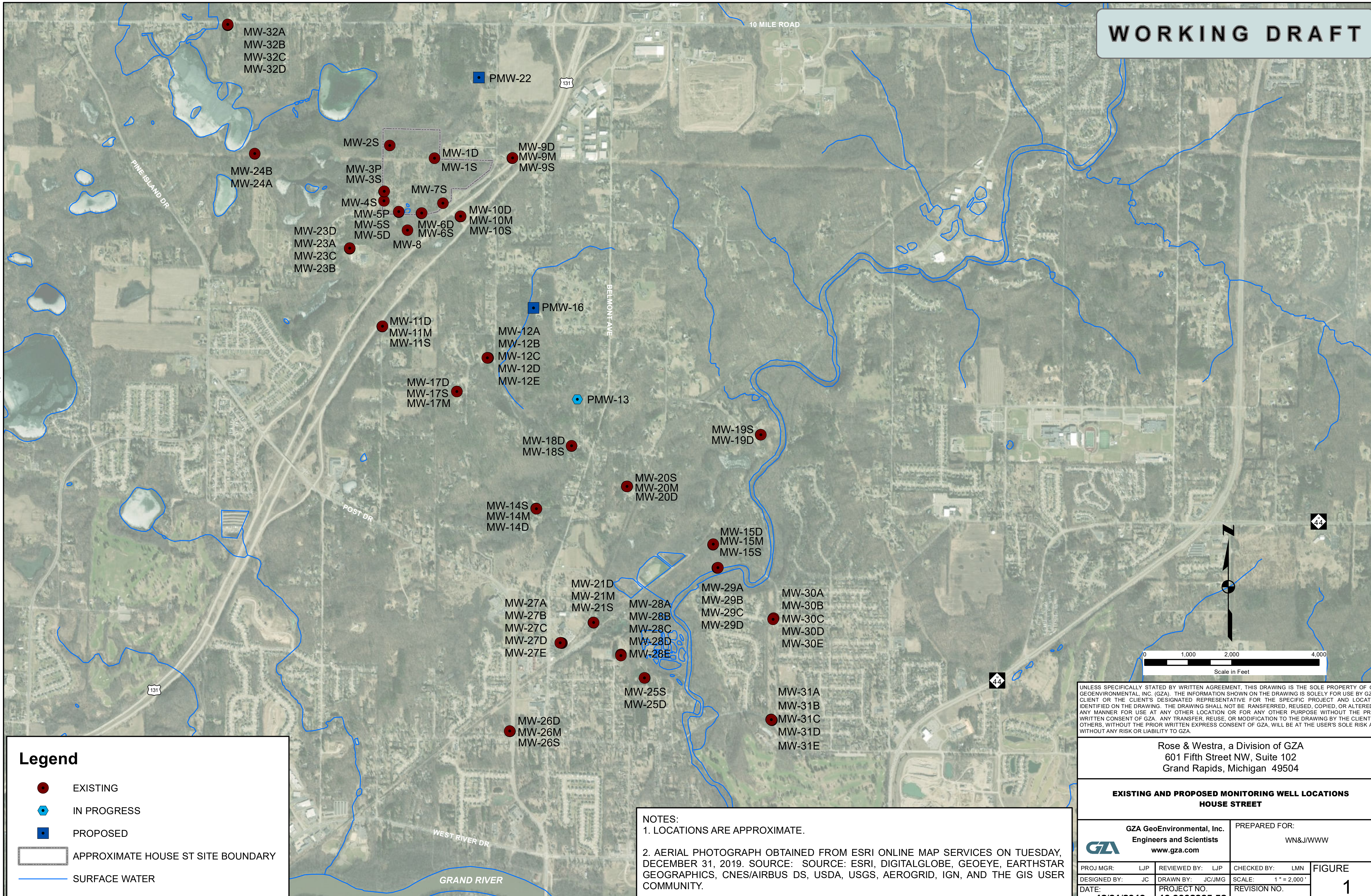
Continue to implement TCRA actions, including completion of the five caps.

OFF-SITE SUMMARY

On November 22, draft scopes of work for parcels on the south side of House Street were submitted to EGLE, EPA, MDOT, and the property owners and their counsel for review and approval prior to implementing any removal actions. Some responses to the scopes of work have been received, but not all parties have responded. Questions and requests are being evaluated. R&W/GZA is also working on approval for waste disposal. Revised waste profiles and approval are underway.

Erosion control was completed at the Imperial Pine parcel (7900 Imperial Pine Drive NE) during this reporting period.

J:\62000\623xx\62335.52 - House St Pre-Inv\MDEQ Updates\December 2019 Update\WWW-House Street-MDEQMonthlyUpdate-01062020-F.docx



Legend

- EXISTING
- IN PROGRESS
- PROPOSED
- APPROXIMATE HOUSE ST SITE BOUNDARY
- SURFACE WATER

NOTES:
1. LOCATIONS ARE APPROXIMATE.

2. AERIAL PHOTOGRAPH OBTAINED FROM ESRI ONLINE MAP SERVICES ON TUESDAY, DECEMBER 31, 2019. SOURCE: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

Rose & Westra, a Division of GZA
601 Fifth Street NW, Suite 102
Grand Rapids, Michigan 49504

EXISTING AND PROPOSED MONITORING WELL LOCATIONS
HOUSE STREET

GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR: WN&J/WWW

PROJ MGR: LJP	REVIEWED BY: LJP	CHECKED BY: LMN	FIGURE
DESIGNED BY: JC	DRAWN BY: JC/JMG	SCALE: 1 " = 2,000 '	
DATE: 12/31/2019	PROJECT NO. 16.0062335.52	REVISION NO.	1

TABLE 1A
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
1855 House St NE
Plainfield 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]	HS-MW-1D	HS-MW-1S	HS-MW-2S	HS-MW-3S	HS-MW-4S	HS-MW-5D	HS-MW-5D	HS-MW-5S	HS-MW-6D	HS-MW-6S	HS-MW-7S	HS-MW-8	HS-MW-10D
Sample Name						HS-GW-MW-1D	HS-GW-MW-1S	HS-GW-MW-2S	HS-GW-MW-3S	HS-GW-MW-4S	HS-GW-MW-5D	HS-GW-MW-5D DUP	HS-GW-MW-5S	HS-GW-MW-6D	HS-GW-MW-6S	HS-GW-MW-7S	HS-GW-MW-8	HS-GW-MW-10D
Well Screen Interval (Feet below ground surface)						172.3-176.9	67.4-72.1	77.9-82.5	70.1-75	70.2-74.8	190.5-200.5	190.5-200.5	60.3-65	157.5-162.5	58.2-62.9	69.9-74.5	30-35	188.2-193.2
Laboratory Sample ID(s)						UL05055-005	UL05055-003	UL05055-009	UL05055-011	UL05055-020	UL05055-018	UL05055-019	UL05055-021	UL05055-028	UL05055-027	UL05055-022	UL05055-031	UL05055-006
Sample Date						12/02/2019	12/02/2019	12/03/2019	12/03/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/05/2019	12/05/2019	12/04/2019	12/06/2019	12/02/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0069	<0.0071	<0.0075	<0.0071	<0.0074	<0.007	<0.0072	<0.14	<0.0071	<0.0072	<0.007	<0.0075	<0.007
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NCL	1,200	0.0054	0.0054	0.04	0.57	0.1	0.005	0.0068	1.4	<0.0036	0.0046	0.0055	0.086	<0.0035
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	0.05	0.74	<0.0035	<0.0036	3.4	<0.0036	<0.0036	<0.0035	0.12	<0.0035
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NCL	NCL	<0.0069	<0.0071	<0.0075	<0.0071	<0.0074	<0.007	<0.0072	<0.14	<0.0071	<0.0072	<0.007	<0.0075	<0.007
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	0.028	0.75	0.38	0.0053	0.0077	3.5	<0.0036	<0.0036	<0.0035	0.11	<0.0035
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	NCL	0.0035	0.022	0.022	1.6	4.6	0.013	0.02	15	<0.0036	0.013	0.01	0.32	<0.0035
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	0.0063	0.14	0.23	<0.0035	<0.0036	0.43	<0.0036	<0.0036	<0.0035	0.017	<0.0035
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	0.0065	0.24	0.45	<0.0035	<0.0036	2.4	<0.0036	<0.0036	<0.0035	0.074	<0.0035
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	0.03	0.51	0.48	<0.0035	<0.0036	1.3	<0.0036	<0.0036	<0.0035	0.031	<0.0035
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	NCL	0.01	0.0072	0.0044	***0.73***	***2.1***	0.008	0.013	***11***	<0.0018	0.012	0.003	***0.7***	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	NCL	0.0038	0.006	<0.0037	***0.023***	***2.3***	0.01	***0.015***	***71***	<0.0036	0.0046	0.0091	***0.12***	<0.0035
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	NCL	0.014	0.013	0.0044	***0.75***	***4.4***	0.018	0.028	***82***	ND	0.017	0.012	***0.82***	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	0.0076	0.16	0.21	<0.0035	<0.0036	0.51	<0.0036	<0.0036	<0.0035	0.011	<0.0035
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0035	<0.0037	<0.0036	<0.0037	<0.0035	<0.0036	<0.071	<0.0036	<0.0036	<0.0035	<0.0038	<0.0035
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	NCL	0.023	0.041	0.14	4.8	12	0.041	0.063	110	ND	0.034	0.028	1.6	ND

TABLE 1A
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
1855 House St NE
Plainfield 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]	HS-MW-10M	HS-MW-10S	HS-MW-11D	HS-MW-11M	HS-MW-11S	HS-MW-12A	HS-MW-12B	HS-MW-12C	HS-MW-12D	HS-MW-12E	HS-MW-14D	HS-MW-14M	HS-MW-14S
Sample Name						HS-GW-MW-10M	HS-GW-MW-10S	HS-GW-MW-11D	HS-GW-MW-11M	HS-GW-MW-11S	HS-GW-MW-12A	HS-GW-MW-12B	HS-GW-MW-12C	HS-GW-MW-12D	HS-GW-MW-12E	HS-GW-MW-14D	HS-GW-MW-14M	HS-GW-MW-14S
Well Screen Interval (Feet below ground surface)						126.4-131.4	48.3-58.3	153.6-158.6	96.4-101.4	21.2-31.2	15.4-20.4	51.5-56.5	127.7-132.7	158.7-163.7	187.5-192.5	109-114	68.1-73.1	13-23
Laboratory Sample ID(s)						UL05055-010	UL05055-001	UL05055-013	UL05055-012	UL05055-014	UK29008-021	UK29008-012	UK29008-011	UK29008-010	UK29008-013	UK29008-016	UK29008-015	UK29008-014
Sample Date						12/03/2019	12/02/2019	12/03/2019	12/03/2019	12/03/2019	11/27/2019	11/25/2019	11/25/2019	11/25/2019	11/25/2019	11/25/2019	11/25/2019	11/25/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0071	<0.0071	<0.0075	<0.0073	<0.0071	<0.0072	<0.0073	<0.0076	<0.0068	<0.007	<0.007	<0.0069	<0.0069
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NCL	1,200	0.0089	0.0037	<0.0038	0.05	<0.0036	<0.0036	<0.0037	0.13	0.14	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	NCL	<0.0036	0.0037	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NCL	NCL	<0.0071	<0.0071	<0.0075	<0.0073	<0.0071	<0.0072	<0.0073	<0.0076	<0.0068	<0.007	<0.007	<0.0069	<0.0069
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	0.016	<0.0036	<0.0036	<0.0037	0.13	0.12	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	NCL	0.0039	0.013	<0.0038	0.0045	<0.0036	<0.0036	0.0054	0.12	0.091	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	0.036	0.037	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	0.07	0.072	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	0.076	0.09	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	NCL	0.01	0.021	<0.0019	<0.0018	0.0041	0.0089	0.0023	***0.19***	***0.17***	<0.0017	<0.0017	<0.0017	<0.0017
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	NCL	***0.013***	***0.024***	<0.0038	<0.0036	<0.0036	0.0063	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	NCL	0.023	0.045	ND	ND	0.0041	0.015	0.0023	***0.19***	***0.17***	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	0.0039	<0.0037	0.039	0.038	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0035	<0.0038	<0.0036	<0.0036	<0.0036	<0.0037	<0.0038	<0.0034	<0.0035	<0.0035	<0.0034	<0.0034
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	NCL	0.036	0.065	ND	0.071	0.0041	0.019	0.0077	0.79	0.76	ND	ND	ND	ND

TABLE 1A
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
1855 House St NE
Plainfield 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]	HS-MW-15D	HS-MW-15M	HS-MW-15S	HS-MW-18D	HS-MW-18S	HS-MW-20D	HS-MW-20M	HS-MW-20S	HS-MW-21M	HS-MW-21S	HS-MW-23A	HS-MW-23B	HS-MW-23C
Sample Name						HS-GW-MW-15D	HS-GW-MW-15M	HS-GW-MW-15S	HS-GW-MW-18D	HS-GW-MW-18S	HS-GW-MW-20D	HS-GW-MW-20M	HS-GW-MW-20S	HS-GW-MW-21M	HS-GW-MW-21S	HS-GW-MW-23A	HS-GW-MW-23B	HS-GW-MW-23C
Well Screen Interval (Feet below ground surface)						108.6-118.6	44.8-49.8	6.9-16.9	140.6-145.6	12.8-22.8	126.1-131.1	101.5-106.5	61.1-66.1	59-64	9.8-19.8	72.1-77.1	137.9-142.8	210.2-215
Laboratory Sample ID(s)						UK19008-012	UK21036-009	UK21036-010	UK19008-015	UK21036-020	UK29008-019	UK29008-002	UK29008-001	UK29008-020	UK29008-022	UL05055-032	UL05055-033	UL05055-034
Sample Date						11/20/2019	11/19/2019	11/19/2019	11/20/2019	11/21/2019	11/27/2019	11/26/2019	11/26/2019	11/27/2019	11/27/2019	12/06/2019	12/06/2019	12/06/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0069	<0.0073	<0.0069	<0.0075	<0.007	<0.0069	<0.0071	<0.007	<0.0074	<0.007	<0.0071	<0.007	<0.0071
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NCL	1,200	<0.0034	<0.0036	0.0073	0.029	<0.0035	0.15	0.06	0.018	<0.0037	0.0036	0.018	0.014	0.28
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	0.0077	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NCL	NCL	<0.0069	<0.0073	<0.0069	<0.0075	<0.007	<0.0069	<0.0071	<0.007	<0.0074	<0.007	<0.0071	<0.007	<0.0071
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	0.014	<0.0035	0.098	0.062	0.012	<0.0037	<0.0035	0.0094	0.0071	0.23
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	0.004	0.0072	0.0043	0.043	0.13	0.013	<0.0037	<0.0035	0.019	0.015	0.09
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	0.02	<0.0035	0.049	0.014	0.0067	<0.0037	<0.0035	<0.0035	<0.0035	0.067
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	0.011	<0.0035	0.076	0.038	0.0092	<0.0037	<0.0035	<0.0035	<0.0035	0.057
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	0.022	<0.0035	0.1	0.034	0.013	<0.0037	<0.0035	<0.0035	0.0044	0.26
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	NCL	<0.0017	<0.0018	0.0018	0.015	<0.0017	***0.11***	***0.15***	0.023	<0.0019	0.0031	0.012	0.0082	0.03
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	***0.029***	<0.0035	<0.0037	<0.0035	***0.015***	<0.0035	<0.0035
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	NCL	ND	ND	0.0018	0.015	ND	***0.11***	***0.18***	0.023	ND	0.0031	0.027	0.0082	0.03
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	0.016	<0.0035	0.049	0.014	0.0064	<0.0037	<0.0035	<0.0035	<0.0035	0.11
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0036	<0.0034	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035	<0.0037	<0.0035	<0.0035	<0.0035	<0.0035
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	NCL	ND	ND	0.013	0.13	0.0043	0.68	0.54	0.1	ND	0.0067	0.073	0.049	1.1

TABLE 1A
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
1855 House St NE
Plainfield 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]	HS-MW-25D	HS-MW-25S	HS-MW-26D	HS-MW-26M	HS-MW-26S	HS-MW-27A	HS-MW-27B	HS-MW-27C	HS-MW-27D	HS-MW-27E	HS-MW-28A	HS-MW-28B	HS-MW-28C
Sample Name						HS-GW-MW-25D	HS-GW-MW-25S	HS-GW-MW-26D	HS-GW-MW-26M	HS-GW-MW-26S	HS-GW-MW-27A	HS-GW-MW-27B	HS-GW-MW-27C	HS-GW-MW-27D	HS-GW-MW-27E	HS-GW-MW-28A	HS-GW-MW-28B	HS-GW-MW-28C
Well Screen Interval (Feet below ground surface)						65.7-70.7	51.1-56.1	79.6-84.6	61.7-66.7	25.8-30.8	21.6-26.2	35.4-38	41.3-45.9	52.4-56.4	58.5-62.5	39.1-43.7	43.3-47.9	49.2-53.8
Laboratory Sample ID(s)						UL05055-004	UL05055-002	UK21036-008	UK21036-005	UK21036-001	UK19008-001	UK19008-003	UK19008-002	UK21036-002	UK19008-004	UK21036-018	UK21036-019	UK21036-016
Sample Date						12/02/2019	12/02/2019	11/19/2019	11/19/2019	11/19/2019	11/18/2019	11/18/2019	11/18/2019	11/19/2019	11/18/2019	11/21/2019	11/21/2019	11/21/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0077	<0.0074	<0.007	<0.0073	<0.0073	<0.0077	<0.0075	<0.0075	<0.0076	<0.0074	<0.0072	<0.0075	<0.0071
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NCL	1,200	0.018	0.012	<0.0035	0.0053	<0.0037	0.004	<0.0037	<0.0038	<0.0038	<0.0037	0.0047	0.0092	<0.0035
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NCL	NCL	<0.0077	<0.0074	<0.007	<0.0073	<0.0073	<0.0077	<0.0075	<0.0075	<0.0076	<0.0074	<0.0072	<0.0075	<0.0071
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	NCL	0.0082	0.0057	<0.0035	<0.0037	<0.0037	0.0056	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	NCL	0.0054	0.0039	<0.0035	<0.0037	<0.0037	0.0067	<0.0037	<0.0038	<0.0038	0.0074	<0.0036	<0.0038	<0.0035
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	NCL	0.005	0.0049	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	NCL	0.012	0.0092	<0.0035	<0.0037	<0.0037	0.0069	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	NCL	0.015	0.014	<0.0017	0.0052	<0.0018	0.0051	<0.0019	<0.0019	<0.0019	0.0025	<0.0018	<0.0019	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	NCL	***0.042***	***0.061***	<0.0035	***0.017***	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	NCL	0.057	***0.075***	ND	0.022	ND	0.0051	ND	ND	ND	0.0025	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	NCL	0.0087	0.0067	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	NCL	<0.0038	<0.0037	<0.0035	<0.0037	<0.0037	<0.0038	<0.0037	<0.0038	<0.0038	<0.0037	<0.0036	<0.0038	<0.0035
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	NCL	0.11	0.12	ND	0.028	ND	0.028	ND	ND	ND	0.0099	0.0047	0.0092	ND

TABLE 1A
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
1855 House St NE
Plainfield 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]	HS-MW-28D	HS-MW-28D	HS-MW-28E	HS-MW-29A	HS-MW-29B	HS-MW-29C	HS-MW-29D	HS-MW-30A	HS-MW-30A	HS-MW-30B	HS-MW-30C	HS-MW-30D	HS-MW-30E
Sample Name						HS-GW-MW-28D	HS-GW-MW-28D DUP	HS-GW-MW-28E	HS-GW-MW-29A	HS-GW-MW-29B	HS-GW-MW-29C	HS-GW-MW-29D	HS-GW-MW-30A	HS-GW-MW-30A DUP	HS-GW-MW-30B	HS-GW-MW-30C	HS-GW-MW-30D	HS-GW-MW-30E
Well Screen Interval (Feet below ground surface)						62.2-66.8	62.2-66.8	82.7-87.3	3.5-13.5	16.8-21.8	27.2-32.2	37.1-42.1	46.9-51.5	46.9-51.5	51.5-56.1	77.4-82	112.7-117.3	123.2-127.7
Laboratory Sample ID(s)						UK21036-014	UK21036-015	UK21036-017	UK19008-006	UK21036-003	UK21036-004	UK19008-005	UK19008-010	UK19008-011	UK19008-014	UK21036-026	UK21036-024	UK21036-025
Sample Date						11/21/2019	11/21/2019	11/21/2019	11/18/2019	11/19/2019	11/19/2019	11/18/2019	11/20/2019	11/20/2019	11/20/2019	11/22/2019	11/22/2019	11/22/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0072	<0.0074	<0.0072	<0.007	<0.0069	<0.007	<0.007	<0.0071	<0.0084	<0.007	<0.0069	<0.0071	<0.0077
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NCL	1,200	<0.0036	<0.0037	<0.0036	0.018	0.024	0.011	0.0035	0.0072	0.0069	0.0073	0.0055	0.0056	0.0059
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	0.01	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NCL	NCL	<0.0072	<0.0074	<0.0072	<0.007	<0.0069	<0.007	<0.007	<0.0071	<0.0084	<0.007	<0.0069	<0.0071	<0.0077
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	0.0056	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	0.025	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	0.0038	<0.0034	<0.0036	<0.0038
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	0.01	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	0.0064	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	0.017	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	NCL	<0.0018	<0.0018	<0.0018	0.036	<0.0017	<0.0018	<0.0018	0.003	0.0027	0.0041	<0.0017	<0.0018	<0.0019
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	NCL	<0.0036	<0.0037	<0.0036	***0.32***	0.004	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	NCL	ND	ND	ND	***0.36***	0.004	ND	ND	0.003	0.0027	0.0041	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	0.01	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0035	<0.0034	<0.0035	<0.0035	<0.0035	<0.0042	<0.0035	<0.0034	<0.0036	<0.0038
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	NCL	ND	ND	ND	0.46	0.028	0.011	0.0035	0.01	0.0096	0.015	0.0055	0.0056	0.0059

TABLE 1A
SUMMARY OF GROUNDWATER SAMPLE ANALYSIS - PFAS
1855 House St NE
Plainfield 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]	HS-MW-31A	HS-MW-31B	HS-MW-31C	HS-MW-31D	HS-MW-31E	HS-MW-32A	HS-MW-32B	HS-MW-32C	HS-MW-32D
Sample Name						HS-GW-MW-31A	HS-GW-MW-31B	HS-GW-MW-31C	HS-GW-MW-31D	HS-GW-MW-31E	HS-GW-MW-32A	HS-GW-MW-32B	HS-GW-MW-32C	HS-GW-MW-32D
Well Screen Interval (Feet below ground surface)						17.1-21.6	26-30.5	41.3-45.8	48.8-53.4	64.1-68.7	60.9-65.5	79.1-83.7	108.8-113.4	142.3-146.9
Laboratory Sample ID(s)						UK21036-006	UK19008-013	UK21036-007	UK21036-027	UK19008-009	UK29008-003	UK29008-004	UK29008-005	UK29008-006
Sample Date						11/19/2019	11/20/2019	11/19/2019	11/22/2019	11/20/2019	11/26/2019	11/26/2019	11/26/2019	11/26/2019
Parameter (µg/L)														
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0073	<0.0073	<0.0073	<0.0075	<0.007	<0.0068	<0.0069	<0.0074	<0.0071
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NCL	1,200	0.0068	0.012	0.015	0.0076	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NCL	NCL	<0.0073	<0.0073	<0.0073	<0.0075	<0.007	<0.0068	<0.0069	<0.0074	<0.0071
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NCL	NCL	<0.0036	0.0043	0.0048	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	NCL	0.0053	0.013	0.01	0.0053	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	NCL	<0.0036	0.0072	0.0047	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	NCL	<0.0036	0.018	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	NCL	0.0043	0.017	0.0073	0.0041	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	NCL	0.0032	0.052	0.0079	0.0074	<0.0018	<0.0017	<0.0017	<0.0019	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	NCL	<0.0036	***0.014***	0.0052	0.007	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	NCL	0.0032	0.066	0.013	0.014	ND	ND	ND	ND	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	NCL	<0.0036	0.014	0.0057	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	NCL	<0.0036	<0.0037	<0.0036	<0.0037	<0.0035	<0.0034	<0.0035	<0.0037	<0.0035
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	NCL	0.02	0.15	0.061	0.031	ND	ND	ND	ND	ND

TABLE 1B
SUMMARY OF VERTICAL AQUIFER PROFILING GROUNDWATER SAMPLE ANALYSIS - PFAS
1855 House St NE
Plainfield 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]	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13	HS-PMW-13
Sample Name						HS-13 59-64	HS-13 69-74	HS-13 79-84	HS-13 89-94	HS-13 99-104	HS-13 109-114	HS-13 119-124	HS-13 129-134	HS-13-139-144	HS-13-149-154	HS-13-159-164	HS-13-169-174	HS-13-179-184
Well Screen Interval (Feet below ground surface)						59-64	69-74	79-84	89-94	99-104	109-114	119-124	129-134	139-144	149-154	159-164	169-174	179-184
Laboratory Sample ID(s)						UL12092-001	UL12092-002	UL12092-003	UL12092-004	UL12092-005	UL12092-006	UL12092-007	UL12092-008	UL17018-001	UL17018-002	UL17018-003	UL17018-004	UL17018-005
Sample Date						12/09/2019	12/10/2019	12/10/2019	12/10/2019	12/10/2019	12/11/2019	12/11/2019	12/11/2019	12/12/2019	12/12/2019	12/12/2019	12/13/2019	12/13/2019
Parameter (µg/L)																		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
N-Methyl perfluorooctane sulfonamide (MeFOSA)	NCL	NCL	NCL	NCL	NCL	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0072	<0.0072	<0.0074	<0.0071	<0.0069	<0.0074	<0.0074	<0.0073
Perfluorobutane sulfonic acid (PFBS)	NCL	NCL	NCL	NCL	1,200	0.0044	0.0044	0.0054	0.0051	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	0.0035	<0.0037	<0.0037	<0.0036
Perfluorodecane sulfonic acid (PFDS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluoroheptane sulfonic acid (PFHpS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorononane sulfonic acid (PFNS)	NCL	NCL	NCL	NCL	NCL	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0072	<0.0072	<0.0074	<0.0071	<0.0069	<0.0074	<0.0074	<0.0073
Perfluorooctane sulfonamide (FOSA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluoropentane sulfonic acid (PFPeS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorohexane sulfonic acid (PFHxS)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	0.011	0.0079	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorobutanoic acid (PFBA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorodecanoic acid (PFDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorododecanoic acid (PFDoDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluoroheptanoic acid (PFHpA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorohexanoic acid (PFHxA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorononanoic acid (PFNA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorooctanoic acid (PFOA)	0.07 (JJ)	12	ID	NCL	NCL	<0.0017	<0.0017	0.0018	0.0035	0.0038	0.0029	0.003	0.0033	0.0031	0.0034	0.0035	0.0023	<0.0018
Perfluorooctane sulfonic acid (PFOS)	0.07 (JJ)	0.012	NLV	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
PFOA + PFOS (Calculated)	0.07	NCL	NCL	NCL	NCL	ND	ND	0.0018	0.0035	0.0038	0.0029	0.003	0.0033	0.0031	0.0034	0.0035	0.0023	ND
Perfluoropentanoic acid (PFPeA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorotetradecanoic acid (PFTeDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluorotridecanoic acid (PFTrDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Perfluoroundecanoic acid (PFUnDA)	NCL	NCL	NCL	NCL	NCL	<0.0034	<0.0034	<0.0034	<0.0034	<0.0034	<0.0036	<0.0036	<0.0037	<0.0035	<0.0034	<0.0037	<0.0037	<0.0036
Total PFAS (Calculated)	NCL	NCL	NCL	NCL	NCL	0.0044	0.0044	0.018	0.017	0.0038	0.0029	0.003	0.007	0.0031	0.0069	0.0035	0.0023	ND

TABLE 1 NOTES

1855 House Street NE

Plainfield 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.
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.
   <u>Abbreviations Include:</u>
   "ID" indicates insufficient data to develop criterion.
   "NCL" indicates no criterion listed in EGLE Table 1.
   "NLV" indicates the substance is not likely to volatilize under most conditions.
   <u>Footnotes Include:</u>
   (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. U.S. EPA Residential Tap Water Regional Removal Management Levels (RMLs) were based on "Generic RML Tables," updated November 2018.
4. Bold, italic number with thick line border or italic parameter name indicates that parameter was detected above the Michigan Part 201 Groundwater Cleanup Criteria. U.S. EPA RMLs are provided for reference only and results detected above the EPA RMLs are not bolded or italicized. The perched groundwater is not likely representative of aquifer conditions at the Site and the RMLs are based on tap water.
5. Abbreviations include:
   "< RL" indicates the parameter was analyzed for but not detected above the method detection limit; RL = Reporting Limit.
6. Screen interval presented for monitoring wells and VAP temporary wells is the top of the screen interval to the bottom of the screen interval in feet below ground surface.