

MEMO

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Date:

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Arcadis Project No.:

B0064479.2018

Subject:

Monitoring Well PFAS Summary- Plants 2 and 6 RACER Trust Site,
Lansing, Michigan

The following provides a summary of the per- and polyfluoroalkyl substances (PFAS) monitoring well sampling completed at RACER Trust, Plants 2 and 6 located in Lansing Township and the City of Lansing, Michigan (Site).

The primary objectives of the PFAS sampling were as follows:

- Determine if PFAS impacts are present in groundwater near potential historical source areas including the Plant 2 LNAPL area, former Plant 2 wastewater treatment plant (WWTP [AOI 2-1]), former Plant 6 WWTP (AOI 6-83), and former Plant 6 paint shop area (AOI 6-81) and paint mixing room (AOI 6-60) areas. Areas of Interest (AOIs) are included on **Figure 1** and **Figure 2**.
- Assess the potential contribution of PFAS impacts to the Site from the former Adam's Plating Company (APC) facility, both in the perched zone, as well as in weathered bedrock.

PFAS was detected in monitoring wells on Plants 2 and 6, however, based on the data collected to date, PFAS distribution is primarily limited to shallow perched groundwater and will not affect proposed corrective measures for the lower 1,4-dioxane plume.

1. GROUNDWATER SAMPLING

Sampling of twenty-one (21) wells at Plant 2 (P2) and eleven (11) wells at Plant 6 (P6) was completed to assess the potential for PFAS in groundwater. Sample locations and relevant AOIs are shown on **Figures 1 and 2**. PFAS sampling was conducted at the Site during two events: second quarter groundwater monitoring event which took place from May 7, 2018 to May 10, 2018, followed by additional sampling utilizing the Cascade Mobile PFAS Laboratory between June 5, 2018 to June 7, 2018. Monitoring wells from both the perched zone and weathered bedrock zone were sampled during the events.

At each location, a sample was collected using low-flow groundwater sampling techniques. Samples collected during the second quarter groundwater sampling event were submitted to SGS Accutest Laboratory located in Orlando, Florida and analyzed for the 24 PFAS contained in the draft Michigan Department of Environmental Quality (MDEQ) PFAS Minimum Laboratory Analyte List (MDEQ, 2018) using modified USEPA Method 537 with isotope dilution (DoD QSM 5.1). Samples collected during the additional sampling in June were submitted to the mobile lab and analyzed for a site specific 10 compound PFAS list using the same method. To avoid cross contamination, all sampling was conducted in accordance with the Arcadis PFAS Sampling Technical Guidance Instruction. QA/QC samples were collected at a rate of one duplicate for every 10 groundwater samples, one matrix spike/matrix spike duplicate per 20 samples, one equipment blank per pump, and one equipment blank per water level meter. All analytical data is summarized on **Table 1** (Plant 2) and **Table 2** (Plant 6). Laboratory analytical reports are included as **Attachment 1**.

2. RESULTS AND DISCUSSION

The MDEQ Part 201 Groundwater Surface Water Interface (GSI) criterion for Perfluorooctanesulfonic acid (PFOS) is 12 nanograms per liter (ng/L), a value based on a non-drinking water surface water receptor. The MDEQ Part 201 Drinking Water (DW) criterion is 70 ng/L for combined concentrations of PFOS and Perfluorooctanoic acid (PFOA). Analytical results for combined PFOS and PFOA are shown on **Figure 1** with a comparison to DW criteria, and analytical results for PFOS compared to GSI criteria are shown on **Figure 2**.

- PFAS at Plant 2 exceeds both the GSI and DW in the central part of property, primarily in the vicinity of the Plant 2 LNAPL area. These impacts are limited to the perched zone and are delineated by the existing monitoring wells along the west side of the Plant 2. Several Plant 2 weathered bedrock monitoring wells show low estimated (j-flag) detections of PFOS and other PFAS compounds, but no exceedances were observed (**Table 1**).
- Sampling at Plant 6 show elevated concentrations of PFOA at well P6-SB-07 located near AOI 6-11, corresponding to a former rinse water cistern. The rinse water cistern is associated with a former phosphoric acid dip process that may have used vapor suppressants containing PFAS. In addition, concentrations of PFAS detected in perched monitoring wells near the property boundaries on Plant 6, exceed the DW and GSI criterion.
- Concentrations of PFAS within the perched zone along the western Plant 2 property boundary were generally low or not detected suggesting the perched contribution from the APC site is limited.
- The low detections (2-3 ng/L) of PFOS detected at weathered bedrock wells within the lower 1,4-dioxane plume will not affect the proposed 1,4-dioxane biosparge remedy design.

- Based on recent discussions with the MDEQ, Perfluorobutanoic acid (PFBA) is considered a particularly mobile PFAS constituent and an indicator of the leading edge of PFAS migration. PFBA has been detected in several wells at the Site at concentrations ranging from 3 ng/L to 624 ng/L (P6-SB-07, Plant 6). PFBA has been detected in both the perched zone and weathered bedrock and is typically co-located with PFOS or PFOA impacts with the exception of three locations at Plant 2; MW-13-43 located in the weathered bedrock along the core of the 1,4-dioxane plume, MW-16-80 located in the weathered bedrock along the western property boundary, and MW-12-08 located in the perched zone south of the Plant 2 LNAPL area. Two of these wells (MW-16-80 and MW-12-08) are at the perimeter of the PFAS impacted areas consistent with a leading edge of impacts. However, the overall distribution of PFBA does not suggest a clear trend in PFAS migration. The PFBA analytical data is included on **Table 1** and **Table 2**.

3. PROPOSED ACTIVITIES

Several weathered bedrock monitoring wells located along the core of the lower 1,4-dioxane plume and along the Plant 2 western property boundary will be resampled as part of the 3rd Quarter 2018 sampling event. Additional monitoring wells located on Plant 6, including monitoring wells located near the Plant 6 entrance, and existing bedrock wells, will be sampled for PFAS to help identify areas where PFAS potentially migrates off-site. A work plan for additional characterization and potential delineation of PFAS east of Plant 6 will be prepared and submitted to MDEQ during 3rd Quarter 2018.

Enclosures:

Table 1 – Plant 2 Monitoring Well Groundwater Results

Table 2 – Plant 6 Monitoring Well Groundwater Results

Figure 1 – PFOS & PFOA in Groundwater – Plants 2 & 6

Figure 2 – PFOS in Groundwater – Plants 2 & 6

Attachment 1 – Laboratory Analytical Reports

TABLES



Table 1
Plant 2 Monitoring Well Analytical Results
RACER Trust Plant 2 - Lansing, Michigan

DRAFT - PRELIMINARY DATA



Location ID: Plant: Sample Depth (ft bgs): Date Collected: Sample Name:		MI GW (DEQ2017) RES DW	MI SW (DEQ2016) Rule 57 HNV (NON-DW)	MW-12-07 Plant 2 - 6/5/2018 MW-12-07_060518	MW-12-08 Plant 2 - 5/9/2018 MW-12-08_050918	MW-12-09 Plant 2 - 6/5/2018 MW-12-09_060518	MW-12-18 Plant 2 - 6/5/2018 MW-12-18_060518	MW-13-43 Plant 2 - 5/8/2018 MW-13-43_050818	MW-14-54 Plant 2 - 5/9/2018 MW-14-54_050918	MW-14-56 Plant 2 - 6/6/2018 MW-14-56_060618	MW-14-57 Plant 2 - 6/7/2018 MW-14-57_060718
Units											
Poly- and Perfluorinated Alkyl Substances											
4:2 Flourotelemer Sulfonate (4:2 FTS)	ng/L	--	--	NA	<8	NA	NA	<8 [<8]	<8	NA	NA
6:2 Flourotelemer Sulfonate (6:2 FTS)	ng/L	--	--	NA	<8	NA	NA	<8 [<8]	19.6	NA	NA
8:2 Flourotelemer Sulfonate (8:2 FTS)	ng/L	--	--	NA	<8	NA	NA	<8 [<8]	<8	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ng/L	--	--	NA	<20	NA	NA	<20 [<20]	<20	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	--	--	NA	<20	NA	NA	<20 [<20]	<20	NA	NA
Perfluorobutanesulfonic acid (PFBS)	ng/L	--	--	<3.47	2.68 J	<3.71	<3.43	<4 [<4]	1.88 J	<3.69	1.38 J
Perfluorobutanoic acid (PFBA)	ng/L	--	--	<39.2	8.29	<41.9	<38.8	3.08 J [3.42 J]	19.9	<41.7 X	<40.5 I
Perfluorodecanesulfonic acid (PFDS)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	<4	NA	NA
Perfluorodecanoic acid (PFDA)	ng/L	--	--	<7.85	<4	<8.38	<7.75	<4 [<4]	<4	<8.33	<8.1
Perfluorododecanoic acid (PFDoA)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	<4	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	--	--	<18.6	<4	<19.9	<18.4	<4 [<4]	<4	<19.8	<19.2
Perfluoroheptanoic acid (PFHpA)	ng/L	--	--	<7.85	2.51 J	6.83 J	<7.75	<4 [<4]	24.6	<8.33	<8.1
Perfluorohexanesulfonic acid (PFHxS)	ng/L	--	--	<5.81	<4	3.12 J	<5.74	<4 [<4]	5.86	<6.17	1.62 J
Perfluorohexanoic acid (PFHxA)	ng/L	--	--	<3.92	7.97	<4.19	<3.88	1.05 J [2.25 J]	31.5	<4.17	<4.05
Perfluorononanesulfonic acid (PFNS)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	<4	NA	NA
Perfluorononanoic acid (PFNA)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	7.47	NA	NA
Perfluorooctane Sulfonamide (FOSA)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	<4	NA	NA
Perfluorooctanesulfonic acid (PFOS)	ng/L	--	12	1.26 J	<4	<6.12	<5.66	<4 [1.57 J]	75.1	<6.08	11.2 J
Perfluorooctanoic acid (PFOA)	ng/L	--	12,000	<3.92	<4	13.2	<3.88	<4 [<4]	63.5	<4.17	7.29
Combined PFOS and PFOA	ng/L	70	--	1.26 J	<8	13.2	<9.54	<8 [1.57 J]	139	<10.25	18.5 J
Perfluoropentanesulfonic acid (PFPeS)	ng/L	--	--	NA	<4	NA	NA	1.13 J [<4]	7.44	NA	NA
Perfluoropentanoic acid (PFPeA)	ng/L	--	--	<19.6	10.9	<21	<19.4	<4 [<4]	36.5	<20.8	8.13 J
Perfluorotetradecanoic acid (PFTeA)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	<4	NA	NA
Perfluorotridecanoic Acid (PFTriA)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	<4	NA	NA
Perfluoroundecanoic acid (PFUnA)	ng/L	--	--	NA	<4	NA	NA	<4 [<4]	<4	NA	NA

Table 1
Plant 2 Monitoring Well Analytical Results
RACER Trust Plant 2 - Lansing, Michigan

DRAFT - PRELIMINARY DATA



Location ID: Plant: Sample Depth (ft bgs): Date Collected: Sample Name:		MI GW (DEQ2017) RES DW	MI SW (DEQ2016) Rule 57 HNV (NON-DW)	MW-14-58 Plant 2 - 5/9/2018 MW-14-58_050918	MW-14-59 Plant 2 - 6/6/2018 MW-14-59_060618	MW-14-60 Plant 2 - 5/9/2018 MW-14-60_050918	MW-14-62 Plant 2 - 5/9/2018 MW-14-62_050918	MW-15-72 Plant 2 - 5/8/2018 MW-15-72_050818	MW-15-73 Plant 2 - 6/6/2018 MW-15-73_060618	MW-16-75 Plant 2 - 6/6/2018 MW-16-75_060618	MW-16-80 Plant 2 - 5/8/2018 MW-16-80_050818
Units											
Poly- and Perfluorinated Alkyl Substances											
4:2 Flourotelemer Sulfonate (4:2 FTS)	ng/L	--	--	<8	NA	<40	<8	<8	NA	NA	<8
6:2 Flourotelemer Sulfonate (6:2 FTS)	ng/L	--	--	<8	NA	<40	77.6	<8	NA	NA	<8
8:2 Flourotelemer Sulfonate (8:2 FTS)	ng/L	--	--	<8	NA	<40	2.49 J	<8	NA	NA	<8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ng/L	--	--	<20	NA	<100	<20	<20	NA	NA	<20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	--	--	<20	NA	<100	<20	<20	NA	NA	<20
Perfluorobutanesulfonic acid (PFBS)	ng/L	--	--	1.05 J	<3.72	16.8 J	1.7 J	<4	<3.83	<3.65	2.52 J
Perfluorobutanoic acid (PFBA)	ng/L	--	--	7.66 J	<42.1 I	10.1 J	30.2	3.71 J	<43.3 X	<41.2 X	3.32 J
Perfluorodecanesulfonic acid (PFDS)	ng/L	--	--	<4	NA	<20	<4	<4	NA	NA	<4
Perfluorodecanoic acid (PFDA)	ng/L	--	--	<4	<8.42	<20	2.83 J	<4	<8.65	<8.25	<4
Perfluorododecanoic acid (PFDoA)	ng/L	--	--	<4	NA	<20	<4	<4	NA	NA	<4
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	--	--	<4	<20	<20	2.91 J	<4	<20.5	<19.6	<4
Perfluoroheptanoic acid (PFHpA)	ng/L	--	--	4.37	3.59 J	9.79 J	26.1	<4	<8.65	<8.25	<4
Perfluorohexanesulfonic acid (PFHxS)	ng/L	--	--	1.48 J	<6.23	<20	11.7	<4	<6.4	<6.1	<4
Perfluorohexanoic acid (PFHxA)	ng/L	--	--	7.58	<4.21	42.2	22.4	3.32 J	<4.33	<4.12	1.29 J
Perfluorononanesulfonic acid (PFNS)	ng/L	--	--	<4	NA	<20	<4	<4	NA	NA	<4
Perfluorononanoic acid (PFNA)	ng/L	--	--	<4	NA	7 J	11.9	<4	NA	NA	<4
Perfluorooctane Sulfonamide (FOSA)	ng/L	--	--	1.15 J	NA	<20	10.6	<4	NA	NA	<4
Perfluorooctanesulfonic acid (PFOS)	ng/L	--	12	<4	<6.15	35.5	67	<4	<6.32	<6.02	<4
Perfluorooctanoic acid (PFOA)	ng/L	--	12,000	8.52	10.1	33.6	94.3	<4	<4.33	<4.12	<4
Combined PFOS and PFOA	ng/L	70	--	8.52	10.1	69.1	161	<8	<10.7	<10.1	<8
Perfluoropentanesulfonic acid (PFPeS)	ng/L	--	--	<4	NA	<20	1.68 J	<4	NA	NA	1.19 J
Perfluoropentanoic acid (PFPeA)	ng/L	--	--	10.1	57.7	<20	25.6	<4	15.2 J	<20.6	4.67
Perfluorotetradecanoic acid (PFTeA)	ng/L	--	--	<4	NA	<20	<4	<4	NA	NA	<4
Perfluorotridecanoic Acid (PFTriA)	ng/L	--	--	<4	NA	<20	<4	<4	NA	NA	<4
Perfluoroundecanoic acid (PFUnA)	ng/L	--	--	<4	NA	<20	<4	<4	NA	NA	<4

Table 1
Plant 2 Monitoring Well Analytical Results
RACER Trust Plant 2 - Lansing, Michigan

DRAFT - PRELIMINARY DATA



Location ID: Plant: Sample Depth (ft bgs): Date Collected: Sample Name:		MI GW (DEQ2017) RES DW	MI SW (DEQ2016) Rule 57 HNV (NON-DW)	MW-16-81 Plant 2 - 5/8/2018 MW-16-81_050818	P2-MW-02 Plant 2 - 5/9/2018 P2-MW-02_050918	P2-MW-03 Plant 2 - 5/10/2018 P2-MW-03_051018	P2-SB-06 Plant 2 - 6/7/2018 P2-SB-06_060718	TW-14-02 Plant 2 - 5/8/2018 TW-14-02_050818
	Units							
Poly- and Perfluorinated Alkyl Substances								
4:2 Flourotelemer Sulfonate (4:2 FTS)	ng/L	--	--	<12	<8	<8	NA	<11
6:2 Flourotelemer Sulfonate (6:2 FTS)	ng/L	--	--	<12	<8	<8	NA	<11
8:2 Flourotelemer Sulfonate (8:2 FTS)	ng/L	--	--	<12	<8	<8	NA	<11
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ng/L	--	--	<29	<20	<20	NA	<26
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	--	--	<29	<20	<20	NA	<26
Perfluorobutanesulfonic acid (PFBS)	ng/L	--	--	<5.9	<4	<4	<3.7	2.91 J
Perfluorobutanoic acid (PFBA)	ng/L	--	--	5.35 J	<8	<8	<41.8 l	4.36 J
Perfluorodecanesulfonic acid (PFDS)	ng/L	--	--	<5.9	<4	<4	NA	<5.3
Perfluorodecanoic acid (PFDA)	ng/L	--	--	<5.9	1.85 J	<4	4.91 J	<5.3
Perfluorododecanoic acid (PFDoA)	ng/L	--	--	<5.9	<4	<4	NA	<5.3
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	--	--	<5.9	<4	<4	<19.9	<5.3
Perfluoroheptanoic acid (PFHpA)	ng/L	--	--	<5.9	1.15 J	1.95 J	36.1	<5.3
Perfluorohexanesulfonic acid (PFHxS)	ng/L	--	--	<5.9	<4	<4	18.4	<5.3
Perfluorohexanoic acid (PFHxA)	ng/L	--	--	4 J	1.12 J	<4	<4.18	1.61 J
Perfluorononanesulfonic acid (PFNS)	ng/L	--	--	<5.9	<4	<4	NA	<5.3
Perfluorononanoic acid (PFNA)	ng/L	--	--	<5.9	1.01 J	<4	NA	<5.3
Perfluorooctane Sulfonamide (FOSA)	ng/L	--	--	<5.9	<4	<4	NA	<5.3
Perfluorooctanesulfonic acid (PFOS)	ng/L	--	12	2.96 J	4.14	<4	40.6	2.47 J
Perfluorooctanoic acid (PFOA)	ng/L	--	12,000	<5.9	1.86 J	<4	49.2	<5.3
Combined PFOS and PFOA	ng/L	70	--	2.96 J	6.0 J	<8	89.8	2.47 J
Perfluoropentanesulfonic acid (PFPeS)	ng/L	--	--	2.42 J	<4	<4	NA	<5.3
Perfluoropentanoic acid (PFPeA)	ng/L	--	--	<5.9	1.28 J	<4	758	7.03
Perfluorotetradecanoic acid (PFTeA)	ng/L	--	--	<5.9	<4	<4	NA	<5.3
Perfluorotridecanoic Acid (PFTriA)	ng/L	--	--	<5.9	<4	<4	NA	<5.3
Perfluoroundecanoic acid (PFUnA)	ng/L	--	--	<5.9	<4	<4	NA	<5.3

Table 1
Plant 2 Monitoring Well Analytical Results
RACER Trust Plant 2 - Lansing, Michigan



Notes:

Bold result denotes detection is above the laboratory reporting limit but below MDEQ Part 201 Generic Cleanup Criteria.

Gray shading denotes exceedances of one or more Proposed 2017 MDEQ Part 201 Generic Cleanup Criteria.

Data shown in brackets [] represent duplicate sample analytical results.

- - = Not listed in the MDEQ Criteria Tables.

All analysis completed using modified USEPA Method 537

Acronyms and Abbreviations:

DW - 2017 MDEQ Part 201 Drinking Water Criteria

ft bgs - feet below ground surface

HNV (Non-DW) - 2016 MDEQ Rule 57 Human Non-Cancer Value for Surface Water from a Non-Drinking Water Source

ng/L - nanograms per liter

NA - Not Analyzed

Analytical Laboratories:

SGS Accutest - SGS Accutest Laboratories, Orlando, FL

Qualifiers:

I = Internal standard recovery outside laboratory acceptance criteria

J = Compound positively detected above laboratory method detection limit below the quantitative reporting limit. The value reported is an estimated concentration.

X = Analyte peak affected by chromatographic interference; use data with caution.

Table 2
Plant 6 Monitoring Well Analytical Results
RACER Trust Plant 6 - Lansing, Michigan

DRAFT - PRELIMINARY DATA



Location ID: Plant: Sample Depth (ft bgs): Date Collected: Sample Name:		MI GW (DEQ2017) RES DW	MI SW (DEQ2016) Rule 57 HNV (NON-DW)	MW-03-05 Plant 6 - 6/7/2018 MW-03-05_060718	MW-03-06 Plant 6 - 6/7/2018 MW-03-06_060718	MW-12-12 Plant 6 - 6/5/2018 MW-12-12_060518	MW-12-13 Plant 6 - 6/5/2018 MW-12-13_060518	MW-13-36R Plant 6 - 6/5/2018 MW-13-36R_060518	MW-14-70 Plant 6 - 5/10/2018 MW-14-70_051018
Poly- and Perfluorinated Alkyl Substances									
4:2 Flourotelemer Sulfonate (4:2 FTS)	ng/L	--	--	NA	NA	NA	NA	NA	<8
6:2 Flourotelemer Sulfonate (6:2 FTS)	ng/L	--	--	NA	NA	NA	NA	NA	<8
8:2 Flourotelemer Sulfonate (8:2 FTS)	ng/L	--	--	NA	NA	NA	NA	NA	<8
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ng/L	--	--	NA	NA	NA	NA	NA	<20
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	--	--	NA	NA	NA	NA	NA	<20
Perfluorobutanesulfonic acid (PFBS)	ng/L	--	--	<3.76	<3.78	<3.7	<3.65	<3.33	5.41
Perfluorobutanoic acid (PFBA)	ng/L	--	--	<42.5	<42.8 X	<41.8	<41.3	<37.6	60.5
Perfluorodecanesulfonic acid (PFDS)	ng/L	--	--	NA	NA	NA	NA	NA	<4
Perfluorodecanoic acid (PFDA)	ng/L	--	--	<8.5	<8.55	11.7	<8.25	18.8	<4
Perfluorododecanoic acid (PFDoA)	ng/L	--	--	NA	NA	NA	NA	NA	<4
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	--	--	<20.2	<20.3	<19.9	<19.6	<17.9	<4
Perfluoroheptanoic acid (PFHpA)	ng/L	--	--	35.6	51.5	88.3	3.71 J	26.3	80
Perfluorohexanesulfonic acid (PFHxS)	ng/L	--	--	1.65 J	<6.33	2.18 J	<6.11	1.47 J	2.13 J
Perfluorohexanoic acid (PFHxA)	ng/L	--	--	45.1	117	309	51.9	26.3	131
Perfluorononanesulfonic acid (PFNS)	ng/L	--	--	NA	NA	NA	NA	NA	<4
Perfluorononanoic acid (PFNA)	ng/L	--	--	NA	NA	NA	NA	NA	<4
Perfluorooctane Sulfonamide (FOSA)	ng/L	--	--	NA	NA	NA	NA	NA	<4
Perfluorooctanesulfonic acid (PFOS)	ng/L	--	12	1.51 J	<6.24	43.5	<6.03	40.5	<4
Perfluorooctanoic acid (PFOA)	ng/L	--	12,000	49.1	6.53	130	<4.13	49.5	38.3
Combined PFOS and PFOA	ng/L	70	--	50.6 J	6.53	174	<10.2	90.0	38.3
Perfluoropentanesulfonic acid (PFPeS)	ng/L	--	--	NA	NA	NA	NA	NA	1.57 J
Perfluoropentanoic acid (PFPeA)	ng/L	--	--	116	280	319	54.1	82.9	179
Perfluorotetradecanoic acid (PFTeA)	ng/L	--	--	NA	NA	NA	NA	NA	<4
Perfluorotridecanoic Acid (PFTriA)	ng/L	--	--	NA	NA	NA	NA	NA	<4
Perfluoroundecanoic acid (PFUnA)	ng/L	--	--	NA	NA	NA	NA	NA	<4

Table 2
Plant 6 Monitoring Well Analytical Results
RACER Trust Plant 6 - Lansing, Michigan

DRAFT - PRELIMINARY DATA



Location ID: Plant: Sample Depth (ft bgs): Date Collected: Sample Name:		MI GW (DEQ2017) RES DW	MI SW (DEQ2016) Rule 57 HNV (NON-DW)	MWBP-12A-UST1-4 Plant 6 - 5/10/2018 MWBP-12A-UST1- 4_051018	P6-SB-07 Plant 6 - 6/7/2018 P6-SB-07_060718	P6-SB-21 Plant 6 - 5/10/2018 P6-SB-21_051018	P6-SB-35 Plant 6 - 5/10/2018 P6-SB-35_051018	P6-SB-37 Plant 6 - 6/5/2018 P6-SB-37_060518
Poly- and Perfluorinated Alkyl Substances								
4:2 Flourotelemer Sulfonate (4:2 FTS)	ng/L	--	--	<8	NA	<8	<8	NA
6:2 Flourotelemer Sulfonate (6:2 FTS)	ng/L	--	--	<8	NA	<8	<8	NA
8:2 Flourotelemer Sulfonate (8:2 FTS)	ng/L	--	--	<8	NA	<8	<8	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	ng/L	--	--	<20	NA	<20	<20	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	--	--	<20	NA	<20	<20	NA
Perfluorobutanesulfonic acid (PFBS)	ng/L	--	--	<4	<3.75	1.43 J	<4	<3.62
Perfluorobutanoic acid (PFBA)	ng/L	--	--	16.4	624	19.2	27.3	<40.8
Perfluorodecanesulfonic acid (PFDS)	ng/L	--	--	<4	NA	<4	<4	NA
Perfluorodecanoic acid (PFDA)	ng/L	--	--	<4	39.5 Q	127	18.1	13.7
Perfluorododecanoic acid (PFDoA)	ng/L	--	--	<4	NA	<4	<4	NA
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	--	--	<4	<20.1	<4	1.14 J	<19.4
Perfluoroheptanoic acid (PFHpA)	ng/L	--	--	10.2	1,190	32.2	18.6	19.1
Perfluorohexanesulfonic acid (PFHxS)	ng/L	--	--	<4	6.32 J	1.84 J	2.09 J	1.67 J
Perfluorohexanoic acid (PFHxA)	ng/L	--	--	29.7	1,610	37	18.5	21.6
Perfluorononanesulfonic acid (PFNS)	ng/L	--	--	<4	NA	<4	<4	NA
Perfluorononanoic acid (PFNA)	ng/L	--	--	<4	NA	29.4	11.6	NA
Perfluorooctane Sulfonamide (FOSA)	ng/L	--	--	<4.2	NA	6.74	4.25	NA
Perfluorooctanesulfonic acid (PFOS)	ng/L	--	12	<4	67	97.8	101	75
Perfluorooctanoic acid (PFOA)	ng/L	--	12,000	7.66	1,640	87.6	45	35.6
Combined PFOS and PFOA	ng/L	70	--	7.66	1,710	185	146	111
Perfluoropentanesulfonic acid (PFPeS)	ng/L	--	--	<4	NA	<4	<4	NA
Perfluoropentanoic acid (PFPeA)	ng/L	--	--	48.5	1,760	49.8	23.5	62.5
Perfluorotetradecanoic acid (PFTeA)	ng/L	--	--	<4	NA	<4	<4	NA
Perfluorotridecanoic Acid (PFTriA)	ng/L	--	--	<4	NA	<4	<4	NA
Perfluoroundecanoic acid (PFUnA)	ng/L	--	--	<4	NA	7.15	<4	NA

Notes:

Bold result denotes detection is above the laboratory reporting limit but below MDEQ Part 201 Generic
Gray shading denotes exceedances of one or more Proposed 2017 MDEQ Part 201 Generic Cleanup Cr
- - = Not listed in the MDEQ Criteria Tables.

All analysis completed using modified USEPA Method 537

Acronyms and Abbreviations:

DW - 2017 MDEQ Part 201 Drinking Water Criteria

ft bgs - feet below ground surface

HNV (Non-DW) - 2016 MDEQ Rule 57 Human Non-Cancer Value for Surface Water from a Non-Drinking
ng/L - nanograms per liter

NA - Not Analyzed

Analytical Laboratories:

SGS Accutest - SGS Accutest Laboratories, Orlando, FL

Cascade Mobile Lab - Cascade Technical Services, Flint, MI

Qualifiers:

J = Compound positively detected above laboratory method detection limit below the quantitative
reporting limit. The value reported is an estimated concentration.

Q = One or more quality control criteria failed (e.g., LCS recovery, surrogate spike recovery or CCV).

X = Analyte peak affected by chromatographic interference; use data with caution.

FIGURES





