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Subject:

Southeast Plant 2 PFAS Investigation Summary Memo – Phases 1 & 2  
RACER Trust Site, Plants 2 and 6, Lansing Township, Michigan (Revised)

Dear Christine:

The following provides a summary of the second phase of soil and groundwater investigation completed for per- and polyfluoroalkyl substances (PFAS) in the southeastern portion of Plant 2, including the western portion of Plant 6, at the Revitalizing Auto Communities Environmental Response (RACER) Trust, located in the Lansing Township, Michigan (Site).

Investigation of PFAS in soil and groundwater on southeastern Plant 2 was initiated in August 2019 in response to elevated detections of perfluorooctanesulfonic acid (PFOS) detected in storm sewer manholes P2-MH-96 and P2-MH-97. The findings of the 2019 Plant 2 PFAS investigation (Phase 1) are summarized in the *Southeast Plant 2 PFAS Investigation Summary* (Arcadis, 2019a) provided to the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for review on December 12, 2019. Sample locations and analytical results from the 2019 investigation are included on **Figures 1A, 1B, and 2**. The results of the Phase 1 Investigation are integrated into the discussion of the Phase 2 results below. The 2019 investigation data indicated the following:

- PFOS in groundwater at concentrations above the Michigan Part 201 Groundwater-Surface Water Interface (GSI) criteria of 12 nanograms per liter (ng/L), ranging from 15 to 5,580 nanograms per liter (ng/L).
- The highest concentrations of PFOS were observed in shallow perched groundwater samples located from 5-10 feet below ground surface (ft bgs).
- The deeper groundwater samples (i.e., 20 to 35 ft bgs) collected suggested that the vertical migration of PFAS is limited by the clay matrix that dominates the material underlying the shallow sand/fill.

Environment

Date:

December 7, 2020

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Soil results are similar with higher PFOS detections in the shallow soils, typically between 1 to 6 ft bgs. Potential source areas were identified with soil concentrations in excess of Groundwater-Surface Water Interface Protection (GSIP) Criteria in two areas: AOI 2-4 and the area west of AOI 2-15 (Arcadis 2019a). The associated groundwater impacts were observed to be more widespread but located central to the Site with a low risk of off-site migration.

As described in the *Southeastern Plant 2 PFAS Investigation - Phase 2 Workplan* (Arcadis, 2020a), the primary objectives of the additional Plant 2 PFAS investigation were as follows:

- Further characterize and delineate the extent of perched PFAS impacts in the southeast portion of Plant 2, potentially extending onto the west portion of Plant 6.
- Assess the potential for vertical migration from the perched zone to the weathered bedrock and provide a vertical sentinel well to monitor for potential future migration near to the identified source areas.

## PHASE 2 INVESTIGATION ACTIVITIES

The Phase 2 scope of work was based on results from the initial phase of investigation completed in 2019. The second phase of the investigation was conducted from July 20<sup>th</sup> to 24<sup>th</sup>, 2020 using methods consistent with the *Southeast Plant 2 PFAS Investigation Workplan* (Arcadis, 2019b) and the *Southeast Plant 2 PFAS Investigation Workplan – Phase 2 Work Plan* (Arcadis, 2020a). The groundwater sampling locations and results are summarized on **Figures 1A** and **1B**. Soil results are summarized on **Figure 2**. Investigation activities included:

- Collection of groundwater samples from two (2) existing monitoring wells (MW-03-07 and MW-03-08) using low-flow sampling methods.
- Completion of five (5) direct push soil borings down to ~40 ft bgs and collection of eight (8) vertical aquifer profile (VAP) groundwater samples from permeable zones identified within the soil borings.
- Completion of one (1) deep soil boring (SB-P2-OM185) and installation of a double-cased weathered bedrock well (MW-20-130) within the previously identified area of the shallow PFAS impacts. Using a rotary-sonic drill rig, the deep soil boring was advanced to a depth of 36 ft bgs and a 7-inch diameter permanent steel casing was cemented in place to prevent vertical migration from the perched zone to the deeper aquifer. The soil boring was continued out of the steel casing to a depth of 70 ft bgs. Weathered bedrock was encountered at 60 ft bgs and a 2-inch permanent monitoring well (MW-20-130) screened from 63 to 68 ft bgs was installed in the borehole. During drilling, a total of seven (7) soil samples were collected at nominal 10-foot intervals throughout the overburden.
- Following development, a groundwater sample was collected from weathered bedrock well MW-20-130 using low-flow sampling techniques.

Soil and groundwater samples were sent to SGS Accutest Laboratory located in Orlando, Florida and analyzed for the full Michigan PFAS list of 28 PFAS compounds outlined in the EGLE PFAS Minimum Laboratory Analyte List (EGLE, 2020) using modified USEPA Method 537 with isotope dilution (DoD QSM 5.3). To avoid cross contamination, all sampling was conducted in accordance with the Arcadis PFAS Sampling Technical Guidance Instruction. Quality Assurance/Quality Control (QA/QC) samples were collected at a frequency of at least one field duplicate (DUP) for every 10 groundwater samples and one

matrix spike/matrix spike duplicate (MS/MSD) collected in triplicate for every 20 samples. Additionally, one field blank (FB) was submitted for every 10 samples.

## RESULTS AND DISCUSSION

The analytical results for groundwater samples from both the 2019 Plant 2 PFAS Investigation, and the 2020 PFAS Investigation, were compared to Part 201 GSI criteria (12 ng/L for PFOS and 12,000 ng/L for Perfluorooctanoic acid [PFOA]). The analytical results for soil samples were compared to EGLE Part 201 Groundwater Surface Water Interface Protection (GSIP) criteria (EGLE, 2018), which is 0.24 micrograms per kilogram [ $\mu\text{g}/\text{kg}$ ] for PFOS and 10,000  $\mu\text{g}/\text{kg}$  for PFOA. Groundwater results were also compared to the recently promulgated Part 201 Residential Drinking Water (DW) criteria (EGLE, 2020) summarized in the following table.

| PFAS   | State Drinking Water Standard |
|--|-------------------------------|
|  | ng/L                          |
| Perfluorooctanoic acid (PFOA)                  | 8                             |
| Perfluorooctanesulfonic acid (PFOS)            | 16                            |
| Perfluorononanoic acid (PFNA)                  | 6                             |
| Perfluorohexane sulfonic acid (PFHxS)          | 51                            |
| Perfluorohexanoic acid (PFHxA)                 | 400,000                       |
| Perfluorobutane sulfonic acid (PFBS)           | 420                           |
| Hexafluoropropylene oxide dimer acid (HFPO-DA) | 370                           |

Groundwater sample locations and analytical results for PFOS and PFOA are shown on **Figures 1A**. Groundwater results for other regulated PFAS compounds including PFNA, PFHxS, PFHxA, and PFBS are shown on **Figure 1B**. HFPO-DA was not detected in groundwater collected during these investigations. Soil analytical results for PFOA and PFOS are summarized on **Figure 2**. The complete analytical data summary for groundwater and soil samples is provided in **Tables 1** and **2**, respectively, and laboratory analytical reports are included as **Attachment 1**. Soil boring logs for the Phase 2 borings are included in **Attachment 2**.

Geology observed in the study area is generally consistent with observations from previous investigations. The geology in the southeast portion of Plant 2 and southwest portion of Plant 6 generally consists of 1 to 10 feet of sandy fill material, followed by an interbedded zone of less-permeable clay with permeable silt and sand lenses containing discontinuous zones of perched water. The interbedded zone transitions to a dense, compact, and primarily dry glacial till, encountered at depths of 20 to 35 ft bgs and ranging from 10 to 30 feet thick. A dry interbedded zone of sand, silt, and clay is located beneath the till, followed by weathered bedrock.

Samples collected during the Phase 1 and 2 investigations suggest the following:

- Groundwater samples collected from 13 of the 17 soil borings completed as part of the Phase 1 and 2 investigations exceed GSI and/or residential DW criteria for PFOS and/or PFOA (Figure 1A). The highest concentrations of PFOS in groundwater were observed during the Phase 1 investigation in the shallow perched sample intervals at soil boring SB-P2-OB177 (5,580 ng/L at 5-10 ft bgs), located to the west of AOI 2-15, and SB-P2-OT192 (5,040 ng/L at 0-5 ft bgs), located at AOI 2-4.
- The PFOA concentrations in groundwater at VAP-P6-PG211, located on Plant 6, are greater than the PFOS concentrations and suggests comingling with the impacts from the former rinse water cistern on Plant 6 where PFOA is the dominant PFAS detected.
- During both the Phase 1 and Phase 2 investigations, PFOS concentrations in deeper groundwater samples collected from confined sand/silt seams were 1-2 orders of magnitude lower than concentrations observed within the shallower unconfined samples or were non-detect. Deeper sample results (i.e., ~20-30 ft bgs) ranged from 4.3 ng/L up to 45.4 ng/L.
- Deep groundwater collected from the newly installed weathered bedrock well (MW-20-130) was non-detect for PFOA/PFOS. Low concentrations of PFBS, PFHxA (10.1 and 2.3 ng/L, respectively) were detected well below the DW Criteria, as well as other non-regulated compounds (**Table 1**). The results indicate vertical migration of PFAS to the bedrock aquifer in this area is limited.
- Concentrations of other PFAS detected in groundwater including PFOA, PFNA, and PFHxS are generally at lower than PFOS within a given perched sample. Of the 17 soil borings completed during the Phase 1 and 2 investigations, four locations contained groundwater with PFNA exceeding the DW criterion of 6 ng/L, and three locations contained groundwater with PFHxS exceeding the DW Criteria of 51 ng/L.
- Eight of seventeen soils borings completed as part of the investigations contained detections of total PFOS in soil that exceeded the GSIP Criteria (Figure 2). Total PFAS includes contributions of PFAS adsorbed to soil as well as PFAS dissolved in porewater. Moisture content of soil samples ranged from 3.9 to 18.3%. Moisture content for samples collected from the till and deeper at SB-P2-OM185/PW-20-130 were all below 10%.
- The two shallowest soil samples collected from SB-P2-OM185/PW-20-130 contained PFOS above GSIP Criteria (1.5 µg/kg from 0.6-1 ft bgs, and 4.5 µg/kg from 9- 9.5 ft bgs). The deeper soil samples (19.5-20, 31-31.5, 41-41.5, 52-52.5, and 59.5-60 ft bgs) were all non-detect for PFAS indicating vertical migration is limited.

## CONCLUSIONS

The extent of soil impacts exceeding GSIP Criteria appear to be comingled with other PFAS impacted areas (e.g., Plant 2 LNAPL Area, Plant 6 former rinse water cistern). Groundwater impacts above GSI and DW criteria are highest in the areas of the identified AOIs, but are also sporadic through the central, interior portion of Plant 2 and Plant 6. A shallow perimeter monitoring network is in place around Plant 2 and will continue to be monitored. Additional monitoring wells will be installed around the perimeter of Plant 6 where PFAS (primarily PFOA) has been identified at the property boundary.

Ms. Christine Matlock  
Michigan Department of Environment, Great Lakes & Energy  
December 7, 2020

The results of the deep soil sampling and weathered bedrock monitoring well installation at SB-P2-OM185/PW-20-130 show only limited vertical migration of PFBS and PFHxA at concentrations well below drinking water criteria and indicate vertical migration is limited by the presence of the glacial till underlying the perched zone. The new weathered bedrock monitoring well MW-20-130 has been integrated into the interim groundwater monitoring plan and will continue to be sampled for PFAS on a semi-annual basis.

The primary off-site exposure pathway for PFAS at Plants 2 and 6 is through migration to surface water via storm sewers. RACER is currently implementing storm sewer modifications outlined in the *Plants 2, 3, and 6 Sewer Modifications Interim Measures Workplan* (Arcadis 2020b) to reduce/eliminate migration offsite through this pathway.

Based on the results of the Phase 1 and 2 southeast Plant 2 PFAS investigations the groundwater monitoring described above in this section will monitor PFAS impacts identified by these investigations and no further investigation is proposed at this time. If you have any questions regarding the investigation summary provided above, please contact Patrick Curry (Arcadis) at 810-225-1926 or Dave Favero (RACER Trust) at 734-879-9525.

Sincerely,



Alex Villhauer  
Project Geologist



Patrick Curry, PG, CPG  
Technical Expert (Geo)

Copies:  
Dave Favero, RACER Trust

## REFERENCES

- EGLE. 2018. Part 201 Generic Cleanup Criteria and Screening Levels. GSI and GSIP Criteria Updated June 25, 2018.
- Arcadis. 2019a. Southeast Plant 2 PFAS Investigation Summary. RACER Trust Site, Plant 2, Lansing Township, Michigan. December 12.
- Arcadis. 2019b. Southeastern Plant 2 PFAS Investigation Work Plan. RACER Trust, Lansing, Michigan, Plant 2. June 18.
- Arcadis. 2020a. Southeastern Plant 2 PFAS Investigation – Phase 2 Work Plan. RACER Trust, Lansing, Michigan, Plant 2. June 10.
- Arcadis. 2020b. Interim Measures Workplan: Plants 2, 3, and 6 Sewer Modifications. RACER Trust, Lansing, Michigan, Plants 2, 3, and 6. September 2020.
- EGLE. 2020. Part 201 Generic Cleanup Criteria and Screening Levels. Residential DW Criteria Updated August 3, 2020.

### Enclosures:

#### Tables

- 1 Summary of Plant 2 PFAS Investigation Groundwater Analytical Results – Phase 2
- 2 Summary of Plant 2 PFAS Investigation Soil Analytical Results – Phase 2

#### Figures

- 1A Groundwater Sampling Locations - PFOS and PFOA Analytical Results
- 1B Groundwater Sampling Locations - Other PFAS Analytical Results
- 2 Soil Sampling Locations and PFAS Analytical Results

#### Attachments

- 1 Laboratory Analytical Reports
- 2 Soil Boring Logs

# TABLES



Table 1  
 Summary of Plant 2 PFAS Investigation Groundwater Analytical Results - Phase 2  
 June-July 2020  
 RACER Trust Plants 2 and 6 - Lansing, Michigan

| Location ID:<br>Sample Depth:<br>Date Collected:<br>Sample Name: | P201 RES DW<br>(EGLE2020) | P201 GSI<br>(EGLE2018) | Units | MW-03-07<br>30-40<br>06/08/20<br>MW-03-07_060820 | MW-03-08<br>35-45<br>06/09/20<br>MW-03-08_060920 | MW-20-130<br>63-68<br>07/23/20<br>MW-20-130_072320 | VAP-P2-NV170<br>6-11<br>07/23/20<br>VAP-P2-NV170_6-11 | VAP-P2-NV170<br>18.5-23.5<br>07/23/20<br>VAP-P2-NV170_18.5-23.5 | VAP-P6-OL211<br>1-6<br>07/23/20<br>VAP-P6-OL211_1-6 | VAP-P6-OL211<br>33-38<br>07/23/20<br>VAP-P6-OL211_33-38 | VAP-P2-OP164<br>10-15<br>07/24/20<br>VAP-P2-OP164_10-15 | VAP-P2-OP164<br>27-32<br>07/24/20<br>VAP-P2-OP164_27-32 | VAP-P6-PG211<br>4-9<br>07/20/20<br>VAP-P6-PG211_4-9 | VAP-P2-PP185<br>19-24<br>07/24/20<br>VAP-P2-PP182_19-24 |
|--|---------------------------|------------------------|-------|--|--|--|---|---|---|---|---|---|---|---|
| <b>PFAS (USEPA Method 527M)</b>                                  |                           |                        |       |  |  |  |   |   |   |   |   |   |   |   |
| 4:2 Fluorotelomer sulfonate (FTS)                                | --                        | --                     | ng/L  | <6.9   | <6.9   | <1.9   | <2.0  | <2.0  | <2.3  | <2.3  | <1.9  | <1.9  | <2.0 [ <b>&lt;2.0</b> ]                             | <1.9  |
| 6:2 Fluorotelomer sulfonate (FTS)                                | --                        | --                     | ng/L  | <6.9   | <6.9   | <1.9   | <b>2.9 J</b>  | <2.0  | <2.3  | <2.3  | <b>6.4 J</b>  | <b>4.3 J</b>  | <2.0 [ <b>&lt;2.0</b> ]                             | <1.9  |
| 8:2 Fluorotelomer sulfonate (FTS)                                | --                        | --                     | ng/L  | <6.9   | <6.9   | <1.9   | <2.0  | <2.0  | <2.3  | <2.3  | <1.9  | <1.9  | <2.0 [ <b>&lt;2.0</b> ]                             | <1.9  |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)        | --                        | --                     | ng/L  | <6.9   | <6.9   | <3.8   | <4.0  | <4.0  | <4.5  | <4.5  | <3.8  | <3.8  | <4.0 [ <b>&lt;4.0</b> ]                             | <3.8  |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)       | --                        | --                     | ng/L  | <6.9   | <6.9   | <3.8   | <4.0  | <4.0  | <4.5  | <4.5  | <3.8  | <3.8  | <4.0 [ <b>&lt;4.0</b> ]                             | <3.8  |
| Perfluorobutanesulfonic acid (PFBS)                              | 420                       | --                     | ng/L  | <3.4   | <3.4   | <b>10.1</b>  | <b>4.7</b>  | <b>180</b>  | <b>2.1 J</b>  | <1.1  | <0.96   | <1.1  | <b>2.0 J [1.6J]</b>                                 | <0.96   |
| Perfluorobutanoic acid (PFBA)                                    | --                        | --                     | ng/L  | <b>4.1 J</b>                                     | <6.9   | <b>6.1 J</b>                                       | <b>12.8</b>   | <b>18.3</b>   | <b>21.9</b>   | <2.3  | <b>78.1</b>   | <b>28.9<sup>a</sup></b>                                 | <b>24.3 [24.2]</b>                                  | <b>4.1 J</b>  |
| Perfluorodecanesulfonic acid (PFDS)                              | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <1.0  | <1.0  | <1.1  | <1.1  | <0.96   | <0.96   | <1.0 [ <b>&lt;1.0</b> ]                             | <0.96   |
| Perfluorodecanoic acid (PFDA)                                    | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <b>2.1 J</b>  | <b>2.5 J</b>  | <1.1  | <1.1  | <0.96   | <0.96   | <b>10.7 [10.4]</b>                                  | <0.96   |
| Perfluorododecanoic acid (PFDoA)                                 | --                        | --                     | ng/L  | <3.4   | <3.4   | <1.4   | <1.5  | <1.5  | <1.7  | <1.7  | <1.4  | <1.4  | <1.5 [ <b>&lt;1.5</b> ]                             | <1.4  |
| Perfluoroheptanesulfonic Acid (PFHpS)                            | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <b>4.7</b>  | <b>2.5 J</b>  | <1.1  | <1.1  | <0.96   | <0.96   | <1.0 [ <b>&lt;1.0</b> ]                             | <0.96   |
| Perfluoroheptanoic acid (PFHpA)                                  | --                        | --                     | ng/L  | <b>1.4 J</b>                                     | <3.4   | <0.96  | <b>14.4</b>   | <b>15.1</b>   | <b>4.2 J</b>  | <1.1  | <b>8.6</b>  | <b>1.9 J</b>  | <b>49.6 [50.2]</b>                                  | <0.96   |
| Perfluorohexanoic acid (PFHxA)                                   | 400,000                   | --                     | ng/L  | <b>5.1</b>                                       | <3.4   | <b>2.3 J</b>                                       | <b>17.4</b>   | <b>21</b>   | <b>5.2</b>  | <1.1  | <b>22.8</b>   | <b>2.8 J</b>  | <b>50.0 [50.8]</b>                                  | <0.96   |
| Perfluorohexanesulfonic acid (PFHxS)                             | 51                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <b>62.7</b>   | <b>23.8</b>   | <1.1  | <1.1  | <b>6.3</b>  | <b>1.7 J</b>  | <b>1.1 J [<b>&lt;1.0</b>]</b>                       | <0.96   |
| Perfluorononanesulfonic acid (PFNS)                              | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <1.0  | <1.0  | <1.1  | <1.1  | <0.96   | <0.96   | <1.0 [ <b>&lt;1.0</b> ]                             | <0.96   |
| Perfluorononanoic acid (PFNA)                                    | 6                         | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <b>3.5 J</b>  | <b>3.1 J</b>  | <1.1  | <1.1  | <0.96   | <0.96   | <b>13.5 [13.2]</b>                                  | <0.96   |
| Perfluorooctane Sulfonamide (PFOSA)                              | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <1.0  | <5.0  | <1.1  | <1.1  | <0.96   | <1.1  | <b>1.8 J [1.4 J]</b>                                | <0.96   |
| Perfluorooctane sulfonic acid (PFOS)                             | 16                        | 12                     | ng/L  | <3.4   | <b>3.4</b>                                       | <1.4   | <b>137</b>  | <b>45.4</b>   | <b>3.0 J</b>  | <1.7  | <b>2.0 J</b>  | <b>4.3</b>  | <b>48.9 [46.1]</b>                                  | <1.4  |
| Perfluorooctanoic acid (PFOA)                                    | 8                         | 12,000                 | ng/L  | <3.4   | <b>0.95 J</b>                                    | <0.96  | <b>28.8</b>   | <b>29.7</b>   | <b>5.7</b>  | <1.1  | <b>21.4</b>   | <b>8.9</b>  | <b>98.2 [98.6]</b>                                  | <b>1.6 J</b>  |
| Perfluoropentanesulfonic acid (PFPeS)                            | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <b>7.3</b>  | <b>16.4</b>   | <1.1  | <1.1  | <0.96   | <1.1  | <1.0 [ <b>&lt;1.0</b> ]                             | <0.96   |
| Perfluoropentanoic acid (PFPeA)                                  | --                        | --                     | ng/L  | <b>8.1</b>                                       | <3.4   | <b>1.6 J</b>                                       | <b>19.3</b>   | <b>17</b>   | <b>5.7</b>  | <1.7  | <b>29.4</b>   | <b>3.6 J</b>  | <b>54.0 [53.5]</b>                                  | <1.4  |
| Perfluorotetradecanoic acid (PFTeA)                              | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <1.0  | <1.0  | <1.1  | <1.1  | <0.96   | <0.96   | <1.0 [ <b>&lt;1.0</b> ]                             | <0.96   |
| Perfluorotridecanoic Acid (PFTriA)                               | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <1.0  | <1.0  | <1.1  | <1.1  | <0.96   | <0.96   | <1.0 [ <b>&lt;1.0</b> ]                             | <0.96   |
| Perfluoroundecanoic acid (PFUnA)                                 | --                        | --                     | ng/L  | <3.4   | <3.4   | <0.96  | <1.0  | <1.0  | <1.1  | <1.1  | <0.96   | <0.96   | <1.0 [ <b>&lt;1.0</b> ]                             | <0.96   |
| Hexafluoropropylene oxide dimer acid (HFPO-DA)                   | 370                       | --                     | ng/L  | NA   | NA   | NA   | NA  | NA  | NA  | NA  | NA  | NA  | NA  | NA  |

**Notes:**

Shading indicates result exceeding one or more EGLE Part 201 Generic Cleanup Criteria and **Bold** fonts represent data where detections were noted above the laboratory method detection limit. Data shown in [ ] represent duplicate sample analytical results. -- = Not listed in the EGLE Criteria Tables.

**Abbreviations:**

mg/L - milligrams per liter  
 s.u. - standard unit  
 Deg. C. - degrees celcius  
 NTU - Nephelometric Turbidity Unit  
 ug/L - micrograms per liter  
 µS/cm - microSiemens per centimeter  
 NA - Not Analyzed

**Lab and Validation Data Qualifiers:**

J = The compound/constituent was positively identified; however, the associated numerical  
<sup>a</sup> Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

**Table 2**  
**Summary of Plant 2 PFAS Investigation Soil Analytical Results - Phase 2**  
**July 2020**  
**RACER Trust Plants 2 and 6 - Lansing, Michigan**

| Location ID:<br>Sample Depth:<br>Date Collected:<br>Sample Name: | P201 GSIP<br>(EGLE2018) | Units | SB-P2-OM185<br>0.6-1<br>07/14/20 | SB-P2-OM185<br>9-9.5<br>07/14/20 | SB-P2-OM185<br>19.5-20<br>07/14/20 | SB-P2-OM185<br>31-31.5<br>07/14/20 | SB-P2-OM185<br>41-41.5<br>07/17/20 | SB-P2-OM185<br>52-52.5<br>07/17/20 | SB-P2-OM185<br>59.5-60<br>07/17/20 |  |
|--|-------------------------|-------|----------------------------------|----------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|--|
|  |                         |       | SB-P2-OM185_0.6-1                | SB-P2-OM185_9-9.5                | SB-P2-OM185_19.5-20                | SB-P2-OM185_31-31.5                | SB-P2-OM185_41-41.5                | SB-P2-OM185_52-52.5                | SB-P2-OM185_59.5-60                |  |
| <b>PFAS (USEPA Method 527M)</b>                                  |                         |       |                                  |                                  |                                    |                                    |                                    |                                    |                                    |  |
| 4:2 Fluorotelomer sulfonate (FTS)                                | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| 6:2 Fluorotelomer sulfonate (FTS)                                | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| 8:2 Fluorotelomer sulfonate (FTS)                                | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| N-ethyl perfluorooctane sulfonamidoacetic acid (NETFOSAA)        | --                      | ug/kg | <0.54                            | <0.48                            | <0.45                              | <0.58                              | <0.54                              | <0.48                              | <0.53                              |  |
| N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)       | --                      | ug/kg | <0.54                            | <0.48                            | <0.45                              | <0.58                              | <0.54                              | <0.48                              | <0.53                              |  |
| Perfluorobutanesulfonic acid (PFBS)                              | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorobutanoic acid (PFBA)                                    | --                      | ug/kg | <0.41                            | <0.36                            | <0.35                              | <0.44                              | <0.41                              | <0.37                              | <0.41                              |  |
| Perfluorodecanesulfonic acid (PFDS)                              | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorodecanoic acid (PFDA)                                    | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorododecanoic acid (PFDoA)                                 | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluoroheptanesulfonic Acid (PFHpS)                            | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluoroheptanoic acid (PFHpA)                                  | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorohexanesulfonic acid (PFHxS)                             | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorohexanoic acid (PFHxA)                                   | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorononanesulfonic acid (PFNS)                              | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorononanoic acid (PFNA)                                    | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorooctane Sulfonamide (PFOSA)                              | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorooctane sulfonic acid (PFOS)                             | 0.24                    | ug/kg | <b>1.5</b>                       | <b>4.5</b>                       | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorooctanoic acid (PFOA)                                    | 10,000                  | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluoropentanesulfonic acid (PFPeS)                            | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluoropentanoic acid (PFPeA)                                  | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorotetradecanoic acid (PFTeA)                              | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Perfluorotridecanoic Acid (PFTriA)                               | --                      | ug/kg | <0.29                            | <0.25                            | <0.24                              | <0.31                              | <0.29                              | <0.26                              | <0.28                              |  |
| Perfluoroundecanoic acid (PFUnA)                                 | --                      | ug/kg | <0.27                            | <0.24                            | <0.23                              | <0.29                              | <0.27                              | <0.24                              | <0.27                              |  |
| Hexafluoropropylene oxide dimer acid (HFPO-DA)                   | --                      | ug/kg | NA                               | NA                               | NA                                 | NA                                 | NA                                 | NA                                 | NA                                 |  |
| <b>General Chemistry</b>   |                         |       |                                  |                                  |                                    |                                    |                                    |                                    |                                    |  |
| Solids, Percent  | --                      | %     | 91.2                             | 86.7                             | 83.9                               | 81.7                               | 90.1                               | 96.1                               | 93.1                               |  |

**Notes:**

Shading indicates result exceeding one or more EGLE Part 201 Generic  
**Bold** fonts represent data where detections were noted above the laboratory method detection limit.  
 Data shown in [ ] represent duplicate sample analytical results.

**Abbreviations:**

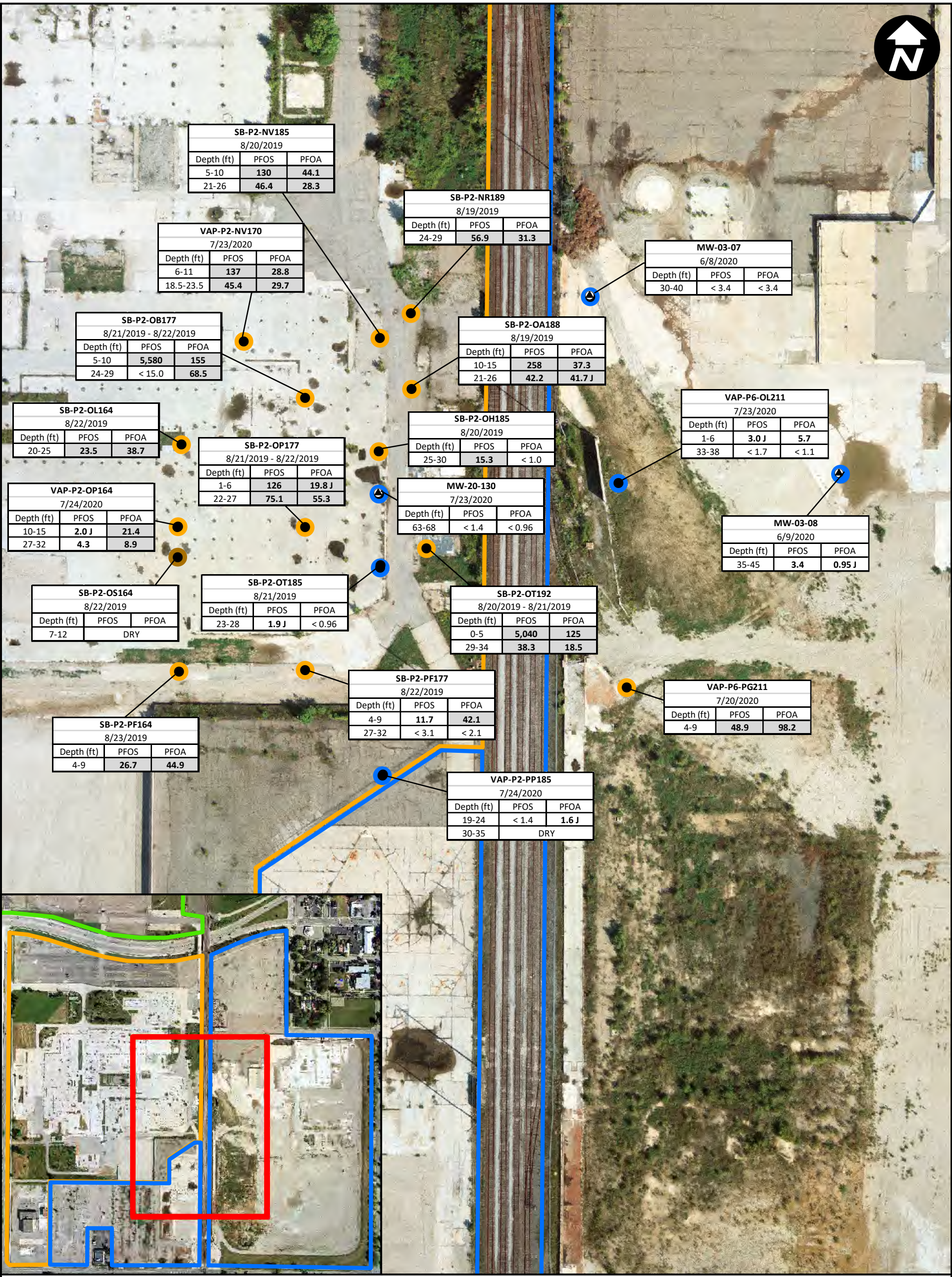
-- = Not listed in the EGLE Criteria Tables.  
 mg/L - milligrams per liter  
 s.u. - standard unit  
 Deg. C. - degrees celcius  
 NTU - Nephelometric Turbidity Unit  
 ug/L - micrograms per liter  
 μS/cm - microSiemens per centimeter  
 NA - Not Analyzed

**Lab and Validation Data Qualifiers:**

J = The compound/constituent was positively identified; however, the  
<sup>a</sup> Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

# FIGURES





| SB-P2-NV185 |      |      |  |
|-------------|------|------|--|
| 8/20/2019   |      |      |  |
| Depth (ft)  | PFOS | PFOA |  |
| 5-10        | 130  | 44.1 |  |
| 21-26       | 46.4 | 28.3 |  |

| SB-P2-NR189 |      |      |  |
|-------------|------|------|--|
| 8/19/2019   |      |      |  |
| Depth (ft)  | PFOS | PFOA |  |
| 24-29       | 56.9 | 31.3 |  |

| VAP-P2-NV170 |      |      |  |
|--------------|------|------|--|
| 7/23/2020    |      |      |  |
| Depth (ft)   | PFOS | PFOA |  |
| 6-11         | 137  | 28.8 |  |
| 18.5-23.5    | 45.4 | 29.7 |  |

| MW-03-07   |       |       |  |
|------------|-------|-------|--|
| 6/8/2020   |       |       |  |
| Depth (ft) | PFOS  | PFOA  |  |
| 30-40      | < 3.4 | < 3.4 |  |

| SB-P2-OB177           |        |      |  |
|-----------------------|--------|------|--|
| 8/21/2019 - 8/22/2019 |        |      |  |
| Depth (ft)            | PFOS   | PFOA |  |
| 5-10                  | 5,580  | 155  |  |
| 24-29                 | < 15.0 | 68.5 |  |

| SB-P2-OA188 |      |        |  |
|-------------|------|--------|--|
| 8/19/2019   |      |        |  |
| Depth (ft)  | PFOS | PFOA   |  |
| 10-15       | 258  | 37.3   |  |
| 21-26       | 42.2 | 41.7 J |  |

| SB-P2-OL164 |      |      |  |
|-------------|------|------|--|
| 8/22/2019   |      |      |  |
| Depth (ft)  | PFOS | PFOA |  |
| 20-25       | 23.5 | 38.7 |  |

| SB-P2-OH185 |      |       |  |
|-------------|------|-------|--|
| 8/20/2019   |      |       |  |
| Depth (ft)  | PFOS | PFOA  |  |
| 25-30       | 15.3 | < 1.0 |  |

| VAP-P6-OL211 |       |       |  |
|--------------|-------|-------|--|
| 7/23/2020    |       |       |  |
| Depth (ft)   | PFOS  | PFOA  |  |
| 1-6          | 3.0 J | 5.7   |  |
| 33-38        | < 1.7 | < 1.1 |  |

| VAP-P2-OP164 |       |      |  |
|--------------|-------|------|--|
| 7/24/2020    |       |      |  |
| Depth (ft)   | PFOS  | PFOA |  |
| 10-15        | 2.0 J | 21.4 |  |
| 27-32        | 4.3   | 8.9  |  |

| SB-P2-OP177           |      |        |  |
|-----------------------|------|--------|--|
| 8/21/2019 - 8/22/2019 |      |        |  |
| Depth (ft)            | PFOS | PFOA   |  |
| 1-6                   | 126  | 19.8 J |  |
| 22-27                 | 75.1 | 55.3   |  |

| MW-20-130  |       |        |  |
|------------|-------|--------|--|
| 7/23/2020  |       |        |  |
| Depth (ft) | PFOS  | PFOA   |  |
| 63-68      | < 1.4 | < 0.96 |  |

| MW-03-08   |      |        |  |
|------------|------|--------|--|
| 6/9/2020   |      |        |  |
| Depth (ft) | PFOS | PFOA   |  |
| 35-45      | 3.4  | 0.95 J |  |

| SB-P2-OS164 |      |      |  |
|-------------|------|------|--|
| 8/22/2019   |      |      |  |
| Depth (ft)  | PFOS | PFOA |  |
| 7-12        | DRY  |      |  |

| SB-P2-OT185 |       |        |  |
|-------------|-------|--------|--|
| 8/21/2019   |       |        |  |
| Depth (ft)  | PFOS  | PFOA   |  |
| 23-28       | 1.9 J | < 0.96 |  |

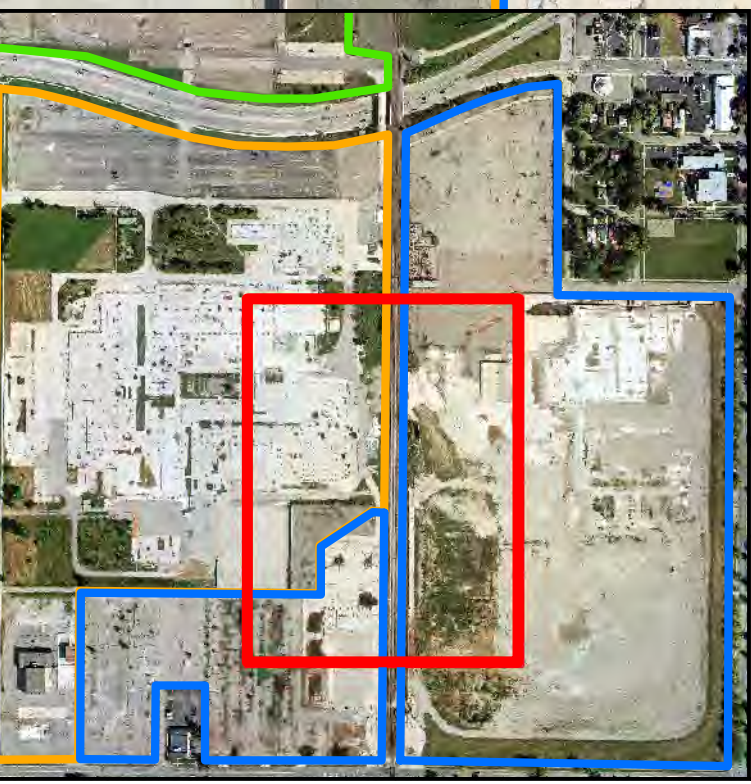
| SB-P2-OT192           |       |      |  |
|-----------------------|-------|------|--|
| 8/20/2019 - 8/21/2019 |       |      |  |
| Depth (ft)            | PFOS  | PFOA |  |
| 0-5                   | 5,040 | 125  |  |
| 29-34                 | 38.3  | 18.5 |  |

| SB-P2-PF177 |       |       |  |
|-------------|-------|-------|--|
| 8/22/2019   |       |       |  |
| Depth (ft)  | PFOS  | PFOA  |  |
| 4-9         | 11.7  | 42.1  |  |
| 27-32       | < 3.1 | < 2.1 |  |

| VAP-P6-PG211 |      |      |  |
|--------------|------|------|--|
| 7/20/2020    |      |      |  |
| Depth (ft)   | PFOS | PFOA |  |
| 4-9          | 48.9 | 98.2 |  |

| SB-P2-PF164 |      |      |  |
|-------------|------|------|--|
| 8/23/2019   |      |      |  |
| Depth (ft)  | PFOS | PFOA |  |
| 4-9         | 26.7 | 44.9 |  |

| VAP-P2-PP185 |       |       |  |
|--------------|-------|-------|--|
| 7/24/2020    |       |       |  |
| Depth (ft)   | PFOS  | PFOA  |  |
| 19-24        | < 1.4 | 1.6 J |  |
| 30-35        | DRY   |       |  |

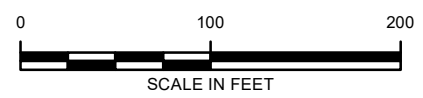


**SAMPLING**

- ▲ PERCHED ZONE MONITORING WELL
  - VAP SOIL BORINGS
  - WELL SAMPLED AND DOES NOT EXCEED GSI OR DW CRITERIA
  - WELL SAMPLED AND EXCEEDS GSI OR DW CRITERIA
  - DRY WELL
- PLANT BOUNDARIES**
- ▭ PLANT 2
  - ▭ PLANT 6

NOTES:

- BOLD TEXT INDICATES A DETECTION ABOVE THE LABORATORY REPORTING LIMIT.
- SHADED VALUES INDICATE AN EXCEEDANCE OF GSI OR DW CRITERIA.
- EGLE PART 201 GROUNDWATER SURFACE WATER INTERFACE (GSI) CRITERIA FOR PFOS IS 12 ng/L AND FOR PFOA IS 12,000 ng/L.
- EGLE PART 201 RESIDENTIAL DRINKING WATER (DW) CRITERIA FOR PFOS IS 16 ng/L AND FOR PFOA IS 8 ng/L.
- ANALYTICAL DATA IS IN ng/L.
- ng/L: NANOGRAMS PER LITER
- J: COMPOUND DETECTED ABOVE LABORATORY METHOD DETECTION LIMIT AND BELOW THE QUANTITATIVE REPORTING LIMIT
- PFOS: PERFLUOROOCTANE SULFONIC ACID
- PFOA: PERFLUOROOCTANOIC ACID



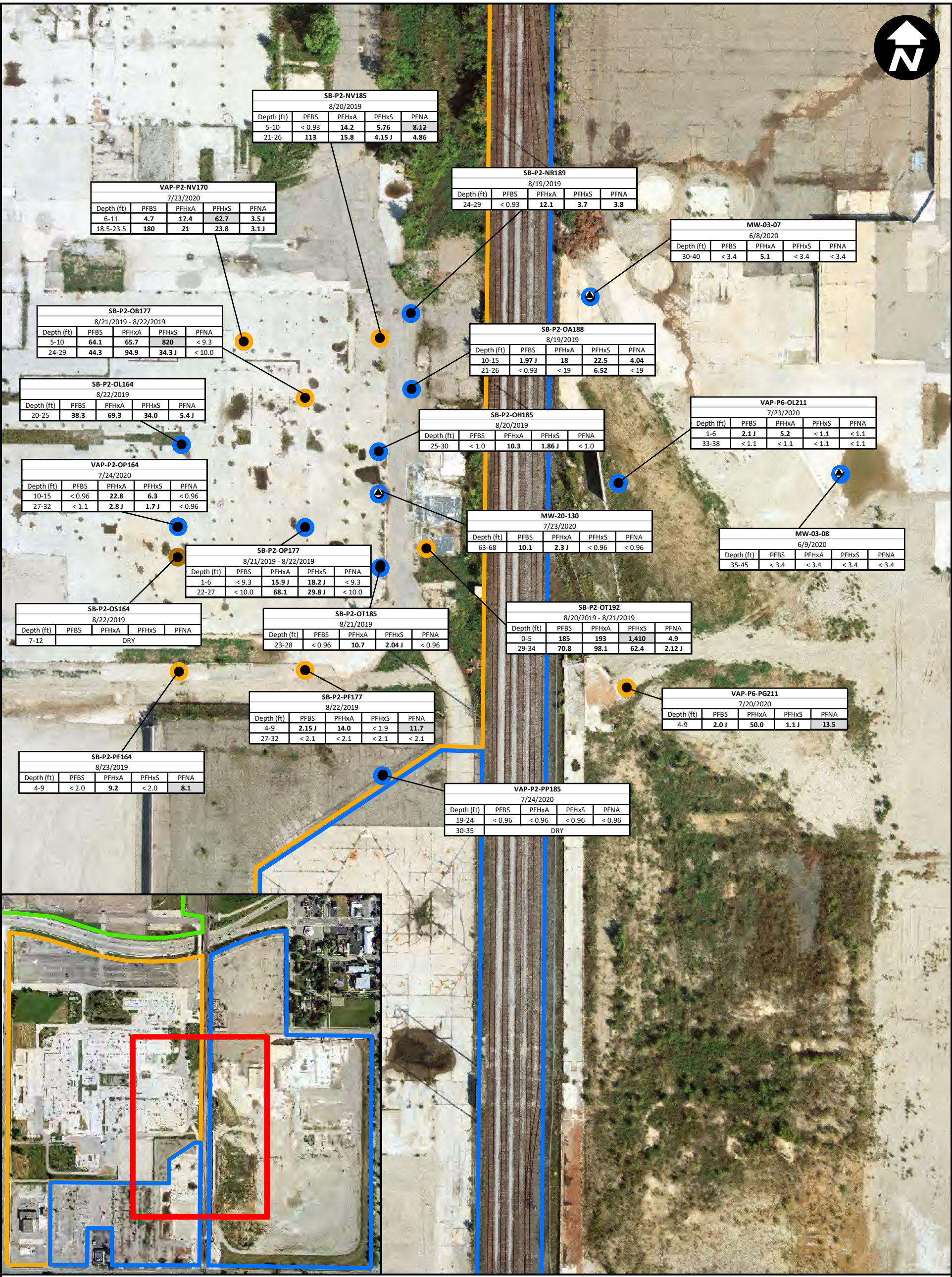
RACER TRUST  
PLANTS 2 & 6  
LANSING, MICHIGAN

**GROUNDWATER - PFOS AND PFOA  
2019-2020 RESULTS**

**ARCADIS** Design & Consultancy  
for natural and  
built assets

FIGURE  
**1A**

CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: P. CURRY PROJECT NUMBER: 30042872.03100 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl M: \GIS\Project Files\RACER\Lansing\Docs\PFAS\Figure\_P2andP6\_GWLPFOS&PFOA\_2020.mxd PLOTTED: 11/18/2020 11:25:41 AM BY: KPullen



CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: P. CURRY PROJECT NUMBER: 30042872.03100 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl M: \GIS\Project Files\RACER\Lansing\Docs\PFAS\Figure\_P2andP6\_GWL\OtherPFAS\_2020.mxd PLOTTED: 11/18/2020 2:29:50 PM BY: KPullen

**SAMPLING**

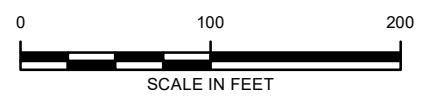
- PERCHED ZONE MONITORING WELL
- VAP SOIL BORINGS
- WELL SAMPLED AND DOES NOT EXCEED DW CRITERIA
- WELL SAMPLED AND EXCEEDS DW CRITERIA
- DRY WELL

**PLANT BOUNDARIES**

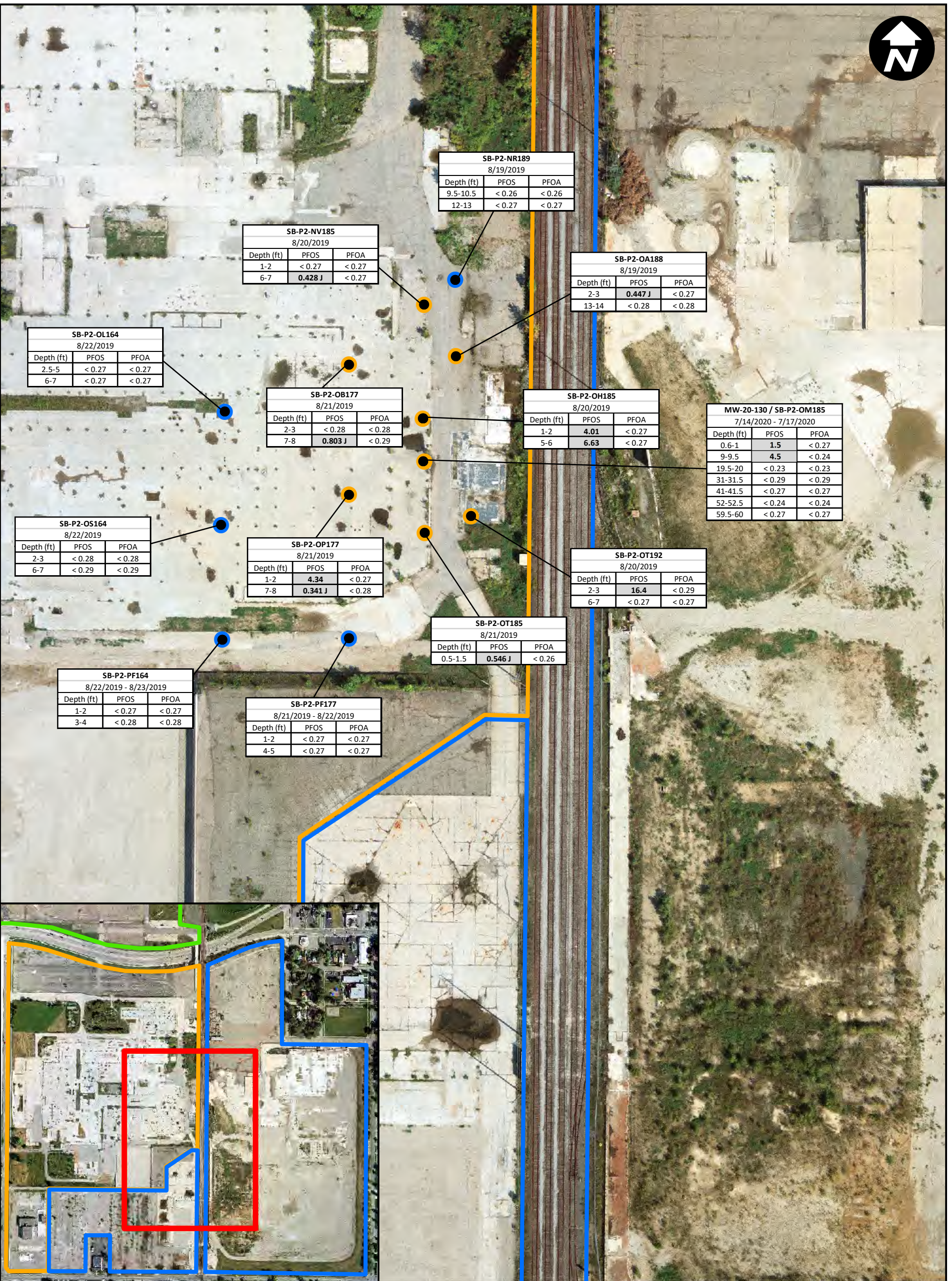
- PLANT 2
- PLANT 6

**NOTES:**

- BOLD TEXT INDICATES A DETECTION ABOVE THE LABORATORY REPORTING LIMIT.
- SHADED VALUES INDICATE AN EXCEEDANCE OF GSI OR DW CRITERIA.
- EGLE PART 201 RESIDENTIAL DRINKING WATER (DW) CRITERIA FOR PFBS IS 420 ng/L, FOR PFHxA IS 400,000 ng/L, FOR PFHxS IS 51 ng/L, AND FOR PFNA IS 6 ng/L.
- ANALYTICAL DATA IS IN ng/L.
- ng/L: NANOGRAMS PER LITER
- J: COMPOUND DETECTED ABOVE LABORATORY METHOD DETECTION LIMIT AND BELOW THE QUANTITATIVE REPORTING LIMIT
- PFBS: PERFLUOROBUTANESULFONIC ACID
- PFHxA: PERFLUOROHEXANOIC ACID
- PFHxS: PERFLUOROHEXANESULFONIC ACID
- PFNA: PERFLUORONONANOIC ACID



|  |   |
|--|---|
| RACER TRUST<br>PLANTS 2 & 6<br>LANSING, MICHIGAN               |   |
| <b>GROUNDWATER - OTHER PFAS<br/>         2019-2020 RESULTS</b> |   |
|  | Design & Consultancy<br>for natural and<br>built assets |
| FIGURE<br><b>1B</b>  |   |



CITY: Novi DIV: ENV PIC: J. BARRETT PM: R. CHRISTENSEN TM: A. VILLHAUER TR: P. CURRY PROJECT NUMBER: 30042872.03100 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl M: \GIS\Project Files\RACER\Lansing\Docs\PFAS\Figure\_P2andP6\_SOILPFOS\_2020.mxd PLOTTED: 1/18/2020 3:47:42 PM BY: KPullen

**SAMPLING**

- VAP SOIL BORINGS
- SOIL SAMPLED AND DOES NOT EXCEED GSIP CRITERIA
- SOIL SAMPLED AND EXCEEDS GSIP CRITERIA

**PLANT BOUNDARIES**

- ▭ PLANT 2
- ▭ PLANT 6

**NOTES:**

- BOLD TEXT INDICATES A DETECTION ABOVE THE LABORATORY REPORTING LIMIT
- SHADED VALUES INDICATE AN EXCEEDANCE OF SOIL GSIP CRITERIA
- EGLE PART 201 GROUNDWATER SURFACE WATER INTERFACE PROTECTION (GSIP) CRITERIA FOR PFOS IS 0.24 ug/kg AND FOR PFOA IS 10,000 ug/kg.
- ANALYTICAL DATA IS IN ug/kg.
- ug/kg: MICROGRAMS PER KILOGRAM
- J: COMPOUND DETECTED ABOVE LABORATORY METHOD DETECTION LIMIT AND BELOW THE QUANTITATIVE REPORTING LIMIT
- PFOS = PERFLUOROCTANE SULFONIC ACID
- PFOA = PERFLUOROCTANOIC ACID



RACER TRUST  
PLANTS 2 & 6  
LANSING, MICHIGAN

**SOIL - PFOS AND PFOA  
2019-2020 RESULTS**



FIGURE

**2**

# ATTACHMENT 1

Laboratory Analytical Reports



The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

**Arcadis**

**Racer Lansing PFAS Delineation; Lansing, MI**

**30042872.03700**

**SGS Job Number: FA75790**

**Sampling Dates: 06/08/20 - 06/09/20**

**Report to:**

**andrea.colby@sgs.com**

**Total number of pages in report: 24**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A handwritten signature in black ink that reads "Caitlin Brice".

**Caitlin Brice, M.S.**  
**General Manager**

**Client Service contact: Andrea Colby 407-425-6700**

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.

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1

2

3

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## Sample Summary

Arcadis

Job No: FA75790

Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03700

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---------------|----------------|---------|----------|-------------|------|------------------|
|---------------|----------------|---------|----------|-------------|------|------------------|

This report contains results reported as ND = Not detected. The following applies:  
Organics ND = Not detected above the MDL

|           |          |       |      |          |    |                 |                 |
|-----------|----------|-------|------|----------|----|-----------------|-----------------|
| FA75790-1 | 06/08/20 | 10:05 | JPAW | 06/10/20 | AQ | Ground Water    | MW-03-07_060820 |
| FA75790-2 | 06/09/20 | 09:30 | JPAW | 06/10/20 | AQ | Equipment Blank | EB-02_060920    |
| FA75790-3 | 06/09/20 | 10:35 | JPAW | 06/10/20 | AQ | Ground Water    | MW-03-08_060920 |

## Summary of Hits

Job Number: FA75790  
Account: Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI  
Collected: 06/08/20 thru 06/09/20

| Lab Sample ID | Client Sample ID | Result/<br>Analyte | RL | MDL | Units | Method |
|---------------|------------------|--------------------|----|-----|-------|--------|
|---------------|------------------|--------------------|----|-----|-------|--------|

FA75790-1 MW-03-07\_060820

|                         |          |        |         |      |                |
|-------------------------|----------|--------|---------|------|----------------|
| Perfluorobutanoic acid  | 0.0041 J | 0.0069 | 0.0017  | ug/l | EPA 537M BY ID |
| Perfluoropentanoic acid | 0.0081   | 0.0034 | 0.0013  | ug/l | EPA 537M BY ID |
| Perfluorohexanoic acid  | 0.0051   | 0.0034 | 0.00086 | ug/l | EPA 537M BY ID |
| Perfluoroheptanoic acid | 0.0014 J | 0.0034 | 0.00086 | ug/l | EPA 537M BY ID |

FA75790-2 EB-02\_060920

No hits reported in this sample.

FA75790-3 MW-03-08\_060920

|                              |           |        |         |      |                |
|------------------------------|-----------|--------|---------|------|----------------|
| Perfluorooctanoic acid       | 0.00095 J | 0.0034 | 0.00086 | ug/l | EPA 537M BY ID |
| Perfluorooctanesulfonic acid | 0.0034    | 0.0034 | 0.0013  | ug/l | EPA 537M BY ID |

**Sample Results**

---

**Report of Analysis**

---

# Report of Analysis

|   |  |                                |
|---|--|--------------------------------|
| <b>Client Sample ID:</b> MW-03-07_060820                    |  |                                |
| <b>Lab Sample ID:</b> FA75790-1                             |  | <b>Date Sampled:</b> 06/08/20  |
| <b>Matrix:</b> AQ - Ground Water                            |  | <b>Date Received:</b> 06/10/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   |  | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |  |                                |

| Run #  | File ID   | DF | Analyzed       | By | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|----------------|------------|------------------|
| Run #1 | 3Q22741.D | 1  | 06/16/20 00:27 | NG | 06/12/20 08:00 | OP80631    | S3Q346           |
| Run #2 |           |    |                |    |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 290 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |        |        |         |      |   |
|------------|-----------------------------|--------|--------|---------|------|---|
| 375-22-4   | Perfluorobutanoic acid      | 0.0041 | 0.0069 | 0.0017  | ug/l | J |
| 2706-90-3  | Perfluoropentanoic acid     | 0.0081 | 0.0034 | 0.0013  | ug/l |   |
| 307-24-4   | Perfluorohexanoic acid      | 0.0051 | 0.0034 | 0.00086 | ug/l |   |
| 375-85-9   | Perfluoroheptanoic acid     | 0.0014 | 0.0034 | 0.00086 | ug/l | J |
| 335-67-1   | Perfluorooctanoic acid      | ND     | 0.0034 | 0.00086 | ug/l |   |
| 375-95-1   | Perfluorononanoic acid      | ND     | 0.0034 | 0.00086 | ug/l |   |
| 335-76-2   | Perfluorodecanoic acid      | ND     | 0.0034 | 0.00086 | ug/l |   |
| 2058-94-8  | Perfluoroundecanoic acid    | ND     | 0.0034 | 0.00086 | ug/l |   |
| 307-55-1   | Perfluorododecanoic acid    | ND     | 0.0034 | 0.0013  | ug/l |   |
| 72629-94-8 | Perfluorotridecanoic acid   | ND     | 0.0034 | 0.00086 | ug/l |   |
| 376-06-7   | Perfluorotetradecanoic acid | ND     | 0.0034 | 0.00086 | ug/l |   |

**PERFLUOROALKYL SULFONATES**

|            |                               |    |        |         |      |  |
|------------|-------------------------------|----|--------|---------|------|--|
| 375-73-5   | Perfluorobutanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND | 0.0034 | 0.00086 | ug/l |  |
| 355-46-4   | Perfluorohexanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND | 0.0034 | 0.00086 | ug/l |  |
| 1763-23-1  | Perfluorooctanesulfonic acid  | ND | 0.0034 | 0.0013  | ug/l |  |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |    |        |         |      |  |
|----------|-------|----|--------|---------|------|--|
| 754-91-6 | PFOSA | ND | 0.0034 | 0.00086 | ug/l |  |
|----------|-------|----|--------|---------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0069 | 0.0034 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0069 | 0.0034 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0069 | 0.0017 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0069 | 0.0017 | ug/l |  |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> MW-03-07_060820                    |                                |
| <b>Lab Sample ID:</b> FA75790-1                             | <b>Date Sampled:</b> 06/08/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 06/10/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0069 | 0.0017 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 61%    |        | 35-135% |
|         | 13C5-PFPeA             | 69%    |        | 50-150% |
|         | 13C5-PFHxA             | 66%    |        | 50-150% |
|         | 13C4-PFHpA             | 66%    |        | 50-150% |
|         | 13C8-PFOA              | 64%    |        | 50-150% |
|         | 13C9-PFNA              | 69%    |        | 50-150% |
|         | 13C6-PFDA              | 83%    |        | 50-150% |
|         | 13C7-PFUnDA            | 79%    |        | 40-140% |
|         | 13C2-PFDoDA            | 78%    |        | 40-140% |
|         | 13C2-PFTeDA            | 72%    |        | 30-130% |
|         | 13C3-PFBS              | 71%    |        | 50-150% |
|         | 13C3-PFHxS             | 65%    |        | 50-150% |
|         | 13C8-PFOS              | 54%    |        | 50-150% |
|         | 13C8-FOSA              | 69%    |        | 30-130% |
|         | d3-MeFOSAA             | 83%    |        | 50-150% |
|         | 13C2-4:2FTS            | 69%    |        | 50-150% |
|         | 13C2-6:2FTS            | 68%    |        | 50-150% |
|         | 13C2-8:2FTS            | 73%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> EB-02_060920                       |                                |
| <b>Lab Sample ID:</b> FA75790-2                             | <b>Date Sampled:</b> 06/09/20  |
| <b>Matrix:</b> AQ - Equipment Blank                         | <b>Date Received:</b> 06/10/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|----------------|------------|------------------|
| Run #1 | 3Q22742.D | 1  | 06/16/20 00:43 | NG | 06/12/20 08:00 | OP80631    | S3Q346           |
| Run #2 |           |    |                |    |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 290 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |    |        |         |      |  |
|------------|-----------------------------|----|--------|---------|------|--|
| 375-22-4   | Perfluorobutanoic acid      | ND | 0.0069 | 0.0017  | ug/l |  |
| 2706-90-3  | Perfluoropentanoic acid     | ND | 0.0034 | 0.0013  | ug/l |  |
| 307-24-4   | Perfluorohexanoic acid      | ND | 0.0034 | 0.00086 | ug/l |  |
| 375-85-9   | Perfluoroheptanoic acid     | ND | 0.0034 | 0.00086 | ug/l |  |
| 335-67-1   | Perfluorooctanoic acid      | ND | 0.0034 | 0.00086 | ug/l |  |
| 375-95-1   | Perfluorononanoic acid      | ND | 0.0034 | 0.00086 | ug/l |  |
| 335-76-2   | Perfluorodecanoic acid      | ND | 0.0034 | 0.00086 | ug/l |  |
| 2058-94-8  | Perfluoroundecanoic acid    | ND | 0.0034 | 0.00086 | ug/l |  |
| 307-55-1   | Perfluorododecanoic acid    | ND | 0.0034 | 0.0013  | ug/l |  |
| 72629-94-8 | Perfluorotridecanoic acid   | ND | 0.0034 | 0.00086 | ug/l |  |
| 376-06-7   | Perfluorotetradecanoic acid | ND | 0.0034 | 0.00086 | ug/l |  |

**PERFLUOROALKYL SULFONATES**

|            |                               |    |        |         |      |  |
|------------|-------------------------------|----|--------|---------|------|--|
| 375-73-5   | Perfluorobutanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND | 0.0034 | 0.00086 | ug/l |  |
| 355-46-4   | Perfluorohexanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND | 0.0034 | 0.00086 | ug/l |  |
| 1763-23-1  | Perfluorooctanesulfonic acid  | ND | 0.0034 | 0.0013  | ug/l |  |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND | 0.0034 | 0.00086 | ug/l |  |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |    |        |         |      |  |
|----------|-------|----|--------|---------|------|--|
| 754-91-6 | PFOSA | ND | 0.0034 | 0.00086 | ug/l |  |
|----------|-------|----|--------|---------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0069 | 0.0034 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0069 | 0.0034 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0069 | 0.0017 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0069 | 0.0017 | ug/l |  |

|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

## Report of Analysis

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|  |  |                         |
|--|--|-------------------------|
| Client Sample ID: EB-02_060920                       |  | Date Sampled: 06/09/20  |
| Lab Sample ID: FA75790-2                             |  | Date Received: 06/10/20 |
| Matrix: AQ - Equipment Blank                         |  | Percent Solids: n/a     |
| Method: EPA 537M BY ID EPA 537 MOD                   |  |                         |
| Project: Racer Lansing PFAS Delineation; Lansing, MI |  |                         |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0069 | 0.0017 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 95%    |        | 35-135% |
|         | 13C5-PFPeA             | 93%    |        | 50-150% |
|         | 13C5-PFHxA             | 94%    |        | 50-150% |
|         | 13C4-PFHpA             | 95%    |        | 50-150% |
|         | 13C8-PFOA              | 95%    |        | 50-150% |
|         | 13C9-PFNA              | 93%    |        | 50-150% |
|         | 13C6-PFDA              | 91%    |        | 50-150% |
|         | 13C7-PFUnDA            | 87%    |        | 40-140% |
|         | 13C2-PFDoDA            | 82%    |        | 40-140% |
|         | 13C2-PFTeDA            | 65%    |        | 30-130% |
|         | 13C3-PFBS              | 93%    |        | 50-150% |
|         | 13C3-PFHxS             | 90%    |        | 50-150% |
|         | 13C8-PFOS              | 84%    |        | 50-150% |
|         | 13C8-FOSA              | 103%   |        | 30-130% |
|         | d3-MeFOSAA             | 97%    |        | 50-150% |
|         | 13C2-4:2FTS            | 90%    |        | 50-150% |
|         | 13C2-6:2FTS            | 88%    |        | 50-150% |
|         | 13C2-8:2FTS            | 82%    |        | 50-150% |

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|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> MW-03-08_060920                    |                                |
| <b>Lab Sample ID:</b> FA75790-3                             | <b>Date Sampled:</b> 06/09/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 06/10/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|----------------|------------|------------------|
| Run #1 | 3Q22743.D | 1  | 06/16/20 00:58 | NG | 06/12/20 08:00 | OP80631    | S3Q346           |
| Run #2 |           |    |                |    |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 290 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |         |        |         |      |   |
|------------|-----------------------------|---------|--------|---------|------|---|
| 375-22-4   | Perfluorobutanoic acid      | ND      | 0.0069 | 0.0017  | ug/l |   |
| 2706-90-3  | Perfluoropentanoic acid     | ND      | 0.0034 | 0.0013  | ug/l |   |
| 307-24-4   | Perfluorohexanoic acid      | ND      | 0.0034 | 0.00086 | ug/l |   |
| 375-85-9   | Perfluoroheptanoic acid     | ND      | 0.0034 | 0.00086 | ug/l |   |
| 335-67-1   | Perfluorooctanoic acid      | 0.00095 | 0.0034 | 0.00086 | ug/l | J |
| 375-95-1   | Perfluorononanoic acid      | ND      | 0.0034 | 0.00086 | ug/l |   |
| 335-76-2   | Perfluorodecanoic acid      | ND      | 0.0034 | 0.00086 | ug/l |   |
| 2058-94-8  | Perfluoroundecanoic acid    | ND      | 0.0034 | 0.00086 | ug/l |   |
| 307-55-1   | Perfluorododecanoic acid    | ND      | 0.0034 | 0.0013  | ug/l |   |
| 72629-94-8 | Perfluorotridecanoic acid   | ND      | 0.0034 | 0.00086 | ug/l |   |
| 376-06-7   | Perfluorotetradecanoic acid | ND      | 0.0034 | 0.00086 | ug/l |   |

**PERFLUOROALKYL SULFONATES**

|            |                               |        |        |         |      |  |
|------------|-------------------------------|--------|--------|---------|------|--|
| 375-73-5   | Perfluorobutanesulfonic acid  | ND     | 0.0034 | 0.00086 | ug/l |  |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND     | 0.0034 | 0.00086 | ug/l |  |
| 355-46-4   | Perfluorohexanesulfonic acid  | ND     | 0.0034 | 0.00086 | ug/l |  |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND     | 0.0034 | 0.00086 | ug/l |  |
| 1763-23-1  | Perfluorooctanesulfonic acid  | 0.0034 | 0.0034 | 0.0013  | ug/l |  |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND     | 0.0034 | 0.00086 | ug/l |  |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND     | 0.0034 | 0.00086 | ug/l |  |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |    |        |         |      |  |
|----------|-------|----|--------|---------|------|--|
| 754-91-6 | PFOSA | ND | 0.0034 | 0.00086 | ug/l |  |
|----------|-------|----|--------|---------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0069 | 0.0034 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0069 | 0.0034 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0069 | 0.0017 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0069 | 0.0017 | ug/l |  |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|  |  |                         |
|--|--|-------------------------|
| Client Sample ID: MW-03-08_060920                    |  | Date Sampled: 06/09/20  |
| Lab Sample ID: FA75790-3                             |  | Date Received: 06/10/20 |
| Matrix: AQ - Ground Water                            |  | Percent Solids: n/a     |
| Method: EPA 537M BY ID EPA 537 MOD                   |  |                         |
| Project: Racer Lansing PFAS Delineation; Lansing, MI |  |                         |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0069 | 0.0017 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 82%    |        | 35-135% |
|         | 13C5-PFPeA             | 85%    |        | 50-150% |
|         | 13C5-PFHxA             | 85%    |        | 50-150% |
|         | 13C4-PFHpA             | 88%    |        | 50-150% |
|         | 13C8-PFOA              | 92%    |        | 50-150% |
|         | 13C9-PFNA              | 91%    |        | 50-150% |
|         | 13C6-PFDA              | 86%    |        | 50-150% |
|         | 13C7-PFUnDA            | 69%    |        | 40-140% |
|         | 13C2-PFDoDA            | 60%    |        | 40-140% |
|         | 13C2-PFTeDA            | 37%    |        | 30-130% |
|         | 13C3-PFBS              | 86%    |        | 50-150% |
|         | 13C3-PFHxS             | 84%    |        | 50-150% |
|         | 13C8-PFOS              | 80%    |        | 50-150% |
|         | 13C8-FOSA              | 73%    |        | 30-130% |
|         | d3-MeFOSAA             | 78%    |        | 50-150% |
|         | 13C2-4:2FTS            | 82%    |        | 50-150% |
|         | 13C2-6:2FTS            | 88%    |        | 50-150% |
|         | 13C2-8:2FTS            | 76%    |        | 50-150% |

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|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

## Misc. Forms

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### Custody Documents and Other Forms

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**Includes the following where applicable:**

- Certification Exceptions
- Chain of Custody

## Parameter Certification Exceptions

Job Number: FA75790  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.  
The certification status of each is indicated below.

| Parameter                     | CAS#        | Method         | Mat | Certification Status   |
|-------------------------------|-------------|----------------|-----|------------------------|
| 4:2 Fluorotelomer sulfonate   | 757124-72-4 | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| 6:2 Fluorotelomer sulfonate   | 27619-97-2  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| 8:2 Fluorotelomer sulfonate   | 39108-34-4  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| EtFOSAA                       | 2991-50-6   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| MeFOSAA                       | 2355-31-9   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| PFOSA                         | 754-91-6    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorobutanesulfonic acid  | 375-73-5    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorobutanoic acid        | 375-22-4    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorodecanesulfonic acid  | 335-77-3    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorodecanoic acid        | 335-76-2    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorododecanoic acid      | 307-55-1    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoroheptanesulfonic acid | 375-92-8    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoroheptanoic acid       | 375-85-9    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorohexanesulfonic acid  | 355-46-4    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorohexanoic acid        | 307-24-4    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorononanesulfonic acid  | 68259-12-1  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorononanoic acid        | 375-95-1    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorooctanesulfonic acid  | 1763-23-1   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorooctanoic acid        | 335-67-1    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoropentanesulfonic acid | 2706-91-4   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoropentanoic acid       | 2706-90-3   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorotetradecanoic acid   | 376-06-7    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorotridecanoic acid     | 72629-94-8  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoroundecanoic acid      | 2058-94-8   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |

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Plant 6

SGS North America Inc - Orlando

FA75790

Chain of Custody

SGS - ORLANDO JOB # :

PAGE 1 OF 1

4405 Vinehead Road, Suite C-15 Orlando, FL 32811  
TEL: 407-425-6700 FAX: 407-425-0707  
www.sgs.com

SGS - ORLANDO Quote # SKIFF #

| Client / Reporting information  |                                | Project Information   |      |                                    |        |                    |       |  |     |            |     | Analytical Information                            |       |                           |          |                         |   |  |  |  |  | Matrix Codes   |
|---|--------------------------------|---|------|------------------------------------|--------|--------------------|-------|--|-----|------------|-----|---|-------|---------------------------|----------|-------------------------|---|--|--|--|--|--|
| Company Name: <u>Arcadis</u>  |                                | Project Name: <u>Racer Landing - Plant 6</u>  |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  | DW - Drinking Water<br>GW - Ground Water<br>WW - Water<br>SW - Surface Water<br>SO - Soil<br>SL - Sludge<br>OI - Oil<br>LIQ - Other Liquid<br>AIR - Air<br>SOL - Other Solid |
| Address: <u>28550 Cabot Drive, Suite 500</u>  |                                | Street: <u>2801 W. Baymeadows Rd</u>  |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| City: <u>NOV</u> State: <u>Mi</u> Zip: <u>48377</u>   |                                | City: <u>Lansing</u> State: <u>Mi</u>   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Project Contact: <u>Michael Spicil@arcadis.com</u>  |                                | Project #: <u>30042872 03700</u>  |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Phone #: <u>313-407-8332</u>  |                                | Fax #: <u>248 994 2241</u>  |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Sampler(s) Name(s) (Printed): <u>John Pisanthieris</u>  |                                | Client Purchase Order #   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Sampler 1:  |                                | COLLECTION  |      |                                    |        |                    |       |  |     |            |     | CONTAINER INFORMATION                             |       |                           |          |                         |   |  |  |  |  | LAB USE ONLY   |
| SGS Orlando Sample #  | Field ID / Point of Collection | DATE  | TIME | SAMPLED BY:                        | MATRIX | TOTAL # OF BOTTLES | OTHER | PHONE                                  | HCl | NO3        | NO2 | NO3   | H2SO4 | MACH-2000                 | DI WATER | MEDIA                   |   |  |  |  |  |  |
| 1   | MW-D3-D7-D100820               | 6/8/20  | 1005 | JSP                                | GW     | 2                  |       |  |     |            |     |   |       |                           |          |                         | X |  |  |  |  |  |
| 2   | EB-02-060920                   | 6/9/20  | 0930 | AW                                 | GW     | 1                  |       |  |     |            |     |   |       |                           |          |                         | X |  |  |  |  |  |
| 3   | MW-03-08-060920                | 6/9/20  | 1035 | AW                                 | GW     | 2                  |       |  |     |            |     |   |       |                           |          |                         | X |  |  |  |  |  |
| Turnaround Time ( Business days)  |                                | Data Deliverable Information  |      |                                    |        |                    |       |  |     |            |     | Comments / Remarks                                |       |                           |          |                         |   |  |  |  |  |  |
| 10 Day (Business) Approved By: / Date:  |                                | <input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY)<br><input type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC)<br><input type="checkbox"/> REDT1 (EPA LEVEL 3)<br><input type="checkbox"/> FULLT1 (EPA LEVEL 4)<br><input checked="" type="checkbox"/> EDD'S |      |                                    |        |                    |       |  |     |            |     | RELINQUISHMENT <u>AG</u><br>RECEIVED BY <u>AG</u> |       |                           |          |                         |   |  |  |  |  |  |
| 7 Day   |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| 5 Day   |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| 3 Day RUSH  |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| 2 Day RUSH  |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| 1 Day RUSH  |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Other <u>Standard</u>   |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Rush T/A Data Available VIA Email or Lablink  |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Sample Custody must be documented below each time samples change possession, including courier delivery.  |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |
| Relinquished by Sampler/Affiliation: <u>AW/Arcadis</u>  |                                | Date Time: <u>6/9/20</u>  |      | Received By/Affiliation: <u>FX</u> |        | Date Time:         |       | Relinquished By/Affiliation: <u>FX</u> |     | Date Time: |     | Received By/Affiliation: <u>AG</u>                |       | Date Time: <u>5/10/20</u> |          | Date Time: <u>930</u>   |   |  |  |  |  |  |
| Relinquished by/Affiliation   |                                | Date Time:  |      | Received By/Affiliation            |        | Date Time:         |       | Relinquished By/Affiliation            |     | Date Time: |     | Received By/Affiliation                           |       | Date Time:                |          | Received By/Affiliation |   |  |  |  |  |  |
| 5   |                                |   |      | 6                                  |        |                    |       | 7                                      |     |            |     | 8   |       |                           |          |                         |   |  |  |  |  |  |
| Lab Use Only : Cooler Temperature (s) Celsius (corrected): <u>3.0</u> <a href="http://www.sgs.com/en/terms-and-conditions">http://www.sgs.com/en/terms-and-conditions</a> |                                |   |      |                                    |        |                    |       |  |     |            |     |   |       |                           |          |                         |   |  |  |  |  |  |

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318



## SGS Sample Receipt Summary

Job Number: FA75790

Client: ARCADIS

Project: RACER LANDING PLANT 6

Date / Time Received: 6/10/2020 9:30:00 AM

Delivery Method: FX

Airbill #s: \_\_\_\_\_

Therm ID: IR 1;

Therm CF: -0.8;

# of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (3.0);

**Cooler Information**

Y or N

- 1. Custody Seals Present
- 2. Custody Seals Intact
- 3. Temp criteria achieved
- 4. Cooler temp verification IR Gun
- 5. Cooler media Ice (Bag)

**Trip Blank Information**

Y or N N/A

- 1. Trip Blank present / cooler
  - 2. Trip Blank listed on COC
- W or S N/A
- 3. Type Of TB Received

**Sample Information**

Y or N N/A

- 1. Sample labels present on bottles
- 2. Samples preserved properly
- 3. Sufficient volume/containers recvd for analysis:
- 4. Condition of sample Intact
- 5. Sample recvd within HT
- 6. Dates/Times/IDs on COC match Sample Label
- 7. VOCs have headspace
- 8. Bottles received for unspecified tests
- 9. Compositing instructions clear
- 10. Voa Soil Kits/Jars received past 48hrs?
- 11. % Solids Jar received?
- 12. Residual Chlorine Present?

**Misc. Information**

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_

Number of 5035 Field Kits: \_\_\_\_\_

Number of Lab Filtered Metals: \_\_\_\_\_

Test Strip Lot #: pH 0-3 230315

pH 10-12 219813A

Other: (Specify) \_\_\_\_\_

Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001  
Rev. Date 05/24/17

Technician: PETERH

Date: 6/10/2020 9:30:00 AM

Reviewer: \_\_\_\_\_

Date: \_\_\_\_\_

**FA75790: Chain of Custody**

**Page 2 of 2**

4.2  
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## MS Semi-volatiles

5

### QC Data Summaries

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#### Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

Job Number: FA75790  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |    |           |            |                  |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
| OP80631-MB | 3Q22718.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C4-PFBA              | 94% 35-135% |
|         | 13C5-PFPeA             | 93% 50-150% |
|         | 13C5-PFHxA             | 95% 50-150% |
|         | 13C4-PFHpA             | 95% 50-150% |
|         | 13C8-PFOA              | 97% 50-150% |
|         | 13C9-PFNA              | 96% 50-150% |
|         | 13C6-PFDA              | 93% 50-150% |
|         | 13C7-PFUnDA            | 85% 40-140% |

## Method Blank Summary

**Job Number:** FA75790  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP80631-MB | 3Q22718.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C2-PFDoDA            | 83% 40-140% |
|         | 13C2-PFTeDA            | 75% 30-130% |
|         | 13C3-PFBS              | 92% 50-150% |
|         | 13C3-PFHxS             | 90% 50-150% |
|         | 13C8-PFOS              | 87% 50-150% |
|         | 13C8-FOSA              | 89% 30-130% |
|         | d3-MeFOSAA             | 98% 50-150% |
|         | 13C2-4:2FTS            | 89% 50-150% |
|         | 13C2-6:2FTS            | 89% 50-150% |
|         | 13C2-8:2FTS            | 85% 50-150% |

# Instrument Blank

Job Number: FA75790  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|             |           |    |          |    |           |            |                  |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
| S3Q346-IBLK | 3Q22688.D | 1  | 06/15/20 | NG | n/a       | n/a        | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA75790-1, FA75790-2, FA75790-3

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C4-PFBA              | 105% 50-150% |
|         | 13C5-PFPeA             | 102% 50-150% |
|         | 13C5-PFHxA             | 102% 50-150% |
|         | 13C4-PFHpA             | 104% 50-150% |
|         | 13C8-PFOA              | 106% 50-150% |
|         | 13C9-PFNA              | 105% 50-150% |
|         | 13C6-PFDA              | 105% 50-150% |
|         | 13C7-PFUnDA            | 105% 50-150% |

# Instrument Blank

**Job Number:** FA75790  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| S3Q346-IBLK | 3Q22688.D | 1  | 06/15/20 | NG | n/a       | n/a        | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA75790-1, FA75790-2, FA75790-3

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C2-PFDoDA            | 106% 50-150% |
|         | 13C2-PFTeDA            | 109% 50-150% |
|         | 13C3-PFBS              | 103% 50-150% |
|         | 13C3-PFHxS             | 101% 50-150% |
|         | 13C8-PFOS              | 99% 50-150%  |
|         | 13C8-FOSA              | 111% 50-150% |
|         | d3-MeFOSAA             | 110% 50-150% |
|         | 13C2-4:2FTS            | 96% 50-150%  |
|         | 13C2-6:2FTS            | 97% 50-150%  |
|         | 13C2-8:2FTS            | 91% 50-150%  |

5.1.2  
5

# Blank Spike Summary

Job Number: FA75790  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |    |           |            |                  |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
| OP80631-BS | 3Q22717.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

| CAS No.        | Compound                      | Spike ug/l | BSP ug/l | BSP % | Limits |
|----------------|-------------------------------|------------|----------|-------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.08       | 0.0765   | 96    | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 0.08       | 0.0792   | 99    | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 0.08       | 0.0769   | 96    | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 0.08       | 0.0784   | 98    | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.08       | 0.0778   | 97    | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | 0.08       | 0.0758   | 95    | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | 0.08       | 0.0770   | 96    | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.08       | 0.0767   | 96    | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | 0.08       | 0.0824   | 103   | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.08       | 0.0892   | 112   | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.08       | 0.0845   | 106   | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.08       | 0.0797   | 100   | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.08       | 0.0811   | 101   | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.08       | 0.0792   | 99    | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.08       | 0.0821   | 103   | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.08       | 0.0773   | 97    | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.08       | 0.0781   | 98    | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | 0.08       | 0.0693   | 87    | 60-130 |
| 754-91-6       | PFOSA                         | 0.08       | 0.0799   | 100   | 70-130 |
| 2355-31-9      | MeFOSAA                       | 0.08       | 0.0770   | 96    | 70-130 |
| 2991-50-6      | EiFOSAA                       | 0.08       | 0.0737   | 92    | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.08       | 0.0768   | 96    | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.08       | 0.0767   | 96    | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.08       | 0.0788   | 99    | 70-130 |

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C4-PFBA              | 74% | 35-135% |
|         | 13C5-PFPeA             | 74% | 50-150% |
|         | 13C5-PFHxA             | 74% | 50-150% |
|         | 13C4-PFHpA             | 75% | 50-150% |
|         | 13C8-PFOA              | 76% | 50-150% |
|         | 13C9-PFNA              | 75% | 50-150% |
|         | 13C6-PFDA              | 72% | 50-150% |
|         | 13C7-PFUnDA            | 63% | 40-140% |

\* = Outside of Control Limits.

5.2.1  
5

# Blank Spike Summary

Job Number: FA75790  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP80631-BS | 3Q22717.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C2-PFDoDA            | 57% | 40-140% |
|         | 13C2-PFTeDA            | 51% | 30-130% |
|         | 13C3-PFBS              | 73% | 50-150% |
|         | 13C3-PFHxS             | 72% | 50-150% |
|         | 13C8-PFOS              | 69% | 50-150% |
|         | 13C8-FOSA              | 62% | 30-130% |
|         | d3-MeFOSAA             | 70% | 50-150% |
|         | 13C2-4:2FTS            | 74% | 50-150% |
|         | 13C2-6:2FTS            | 73% | 50-150% |
|         | 13C2-8:2FTS            | 69% | 50-150% |

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75790  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| OP80631-MS  | 3Q22737.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |
| OP80631-MSD | 3Q22738.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |
| FA75789-6   | 3Q22736.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

| CAS No.        | Compound                      | FA75789-6<br>ug/l | Spike<br>Q<br>ug/l | MS<br>ug/l | MS<br>% | Spike<br>ug/l | MSD<br>ug/l | MSD<br>% | RPD | Limits<br>Rec/RPD |
|----------------|-------------------------------|-------------------|--------------------|------------|---------|---------------|-------------|----------|-----|-------------------|
| 375-22-4       | Perfluorobutanoic acid        | ND                | 0.0714             | 0.0669     | 94      | 0.0714        | 0.0604      | 85       | 10  | 70-130/30         |
| 2706-90-3      | Perfluoropentanoic acid       | ND                | 0.0714             | 0.0725     | 101     | 0.0714        | 0.0653      | 91       | 10  | 70-130/30         |
| 307-24-4       | Perfluorohexanoic acid        | ND                | 0.0714             | 0.0672     | 94      | 0.0714        | 0.0609      | 85       | 10  | 70-130/30         |
| 375-85-9       | Perfluoroheptanoic acid       | ND                | 0.0714             | 0.0701     | 98      | 0.0714        | 0.0625      | 87       | 11  | 70-130/30         |
| 335-67-1       | Perfluorooctanoic acid        | ND                | 0.0714             | 0.0695     | 97      | 0.0714        | 0.0628      | 88       | 10  | 70-130/30         |
| 375-95-1       | Perfluorononanoic acid        | ND                | 0.0714             | 0.0683     | 96      | 0.0714        | 0.0619      | 87       | 10  | 70-130/30         |
| 335-76-2       | Perfluorodecanoic acid        | ND                | 0.0714             | 0.0707     | 99      | 0.0714        | 0.0638      | 89       | 10  | 70-130/30         |
| 2058-94-8      | Perfluoroundecanoic acid      | ND                | 0.0714             | 0.0702     | 98      | 0.0714        | 0.0637      | 89       | 10  | 70-130/30         |
| 307-55-1       | Perfluorododecanoic acid      | ND                | 0.0714             | 0.0735     | 103     | 0.0714        | 0.0667      | 93       | 10  | 70-130/30         |
| 72629-94-8     | Perfluorotridecanoic acid     | ND                | 0.0714             | 0.0770     | 108     | 0.0714        | 0.0767      | 107      | 0   | 65-130/30         |
| 376-06-7       | Perfluorotetradecanoic acid   | ND                | 0.0714             | 0.0715     | 100     | 0.0714        | 0.0653      | 91       | 9   | 70-130/30         |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND                | 0.0714             | 0.0828     | 116     | 0.0714        | 0.0741      | 104      | 11  | 70-130/30         |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND                | 0.0714             | 0.0693     | 97      | 0.0714        | 0.0617      | 86       | 12  | 70-130/30         |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND                | 0.0714             | 0.0690     | 97      | 0.0714        | 0.0628      | 88       | 9   | 70-130/30         |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND                | 0.0714             | 0.0750     | 105     | 0.0714        | 0.0693      | 97       | 8   | 70-130/30         |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND                | 0.0714             | 0.0719     | 101     | 0.0714        | 0.0641      | 90       | 11  | 70-130/30         |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND                | 0.0714             | 0.0713     | 100     | 0.0714        | 0.0646      | 90       | 10  | 65-130/30         |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND                | 0.0714             | 0.0656     | 92      | 0.0714        | 0.0581      | 81       | 12  | 60-130/30         |
| 754-91-6       | PFOSA                         | ND                | 0.0714             | 0.0684     | 96      | 0.0714        | 0.0628      | 88       | 9   | 70-130/30         |
| 2355-31-9      | MeFOSAA                       | ND                | 0.0714             | 0.0751     | 105     | 0.0714        | 0.0655      | 92       | 14  | 70-130/30         |
| 2991-50-6      | EtFOSAA                       | ND                | 0.0714             | 0.0751     | 105     | 0.0714        | 0.0657      | 92       | 13  | 70-130/30         |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND                | 0.0714             | 0.0685     | 96      | 0.0714        | 0.0621      | 87       | 10  | 70-130/30         |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND                | 0.0714             | 0.0682     | 95      | 0.0714        | 0.0619      | 87       | 10  | 70-130/30         |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND                | 0.0714             | 0.0717     | 100     | 0.0714        | 0.0633      | 89       | 12  | 70-130/30         |

| CAS No.     | ID Standard Recoveries | MS  | MSD | FA75789-6 | Limits  |
|-------------|------------------------|-----|-----|-----------|---------|
| 13C4-PFBA   |                        | 61% | 81% | 83%       | 35-135% |
| 13C5-PFPeA  |                        | 62% | 84% | 86%       | 50-150% |
| 13C5-PFHxA  |                        | 61% | 82% | 83%       | 50-150% |
| 13C4-PFHpA  |                        | 63% | 85% | 86%       | 50-150% |
| 13C8-PFOA   |                        | 67% | 89% | 94%       | 50-150% |
| 13C9-PFNA   |                        | 68% | 91% | 94%       | 50-150% |
| 13C6-PFDA   |                        | 63% | 85% | 90%       | 50-150% |
| 13C7-PFUnDA |                        | 58% | 78% | 77%       | 40-140% |

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA75790  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| OP80631-MS  | 3Q22737.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |
| OP80631-MSD | 3Q22738.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |
| FA75789-6   | 3Q22736.D | 1  | 06/15/20 | NG | 06/12/20  | OP80631    | S3Q346           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA75790-1, FA75790-2, FA75790-3

| CAS No. | ID Standard Recoveries | MS  | MSD | FA75789-6 | Limits  |
|---------|------------------------|-----|-----|-----------|---------|
|         | 13C2-PFDoDA            | 57% | 77% | 76%       | 40-140% |
|         | 13C2-PFTeDA            | 56% | 65% | 72%       | 30-130% |
|         | 13C3-PFBS              | 62% | 83% | 85%       | 50-150% |
|         | 13C3-PFHxS             | 61% | 80% | 81%       | 50-150% |
|         | 13C8-PFOS              | 60% | 81% | 82%       | 50-150% |
|         | 13C8-FOSA              | 68% | 81% | 92%       | 30-130% |
|         | d3-MeFOSAA             | 63% | 86% | 86%       | 50-150% |
|         | 13C2-4:2FTS            | 63% | 84% | 81%       | 50-150% |
|         | 13C2-6:2FTS            | 65% | 88% | 88%       | 50-150% |
|         | 13C2-8:2FTS            | 60% | 81% | 80%       | 50-150% |

\* = Outside of Control Limits.

5.3.1  
5

The results set forth herein are provided by SGS North America Inc.

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## Technical Report for

### Arcadis

Racer Lansing PFAS Delineation; Lansing, MI

30042872.03100

SGS Job Number: FA77230

Sampling Dates: 07/14/20 - 07/24/20

### Report to:

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Total number of pages in report: 101



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.  
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FI002), NY(12022), SC(96038001)  
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

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Test results relate only to samples analyzed.

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## Sample Summary

**Arcadis**

**Job No: FA77230**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03100**

| Sample Number | Collected Date | Time By | Received | Matrix Code | Type | Client Sample ID |
|---------------|----------------|---------|----------|-------------|------|------------------|
|---------------|----------------|---------|----------|-------------|------|------------------|

**This report contains results reported as ND = Not detected. The following applies:  
Organics ND = Not detected above the MDL**

|            |          |       |              |    |              |                        |
|------------|----------|-------|--------------|----|--------------|------------------------|
| FA77230-1  | 07/14/20 | 14:15 | AWKD07/28/20 | SO | Soil         | SB-P2-OM185_0.6-1      |
| FA77230-2  | 07/14/20 | 14:20 | AWKD07/28/20 | SO | Soil         | SB-P2-OM185_9-9.5      |
| FA77230-3  | 07/14/20 | 14:25 | AWKD07/28/20 | SO | Soil         | SB-P2-OM185_19.5-20    |
| FA77230-4  | 07/14/20 | 14:30 | AWKD07/28/20 | SO | Soil         | SB-P2-OM185_31-31.5    |
| FA77230-5  | 07/17/20 | 14:15 | AWKD07/28/20 | SO | Soil         | SB-P2-OM185_41-41.5    |
| FA77230-6  | 07/17/20 | 14:35 | AWKD07/28/20 | SO | Soil         | SB-P2-OM185_52-52.5    |
| FA77230-7  | 07/17/20 | 14:55 | AWKD07/28/20 | SO | Soil         | SB-P2-OM185_59.5-60    |
| FA77230-8  | 07/20/20 | 15:43 | AWKD07/28/20 | AQ | Ground Water | VAP-P6-PG211_4-9       |
| FA77230-9  | 07/20/20 | 00:00 | AWKD07/28/20 | AQ | Ground Water | DUP-01                 |
| FA77230-10 | 07/23/20 | 08:28 | AWKD07/28/20 | AQ | Ground Water | VAP-P2-NV170_6-11      |
| FA77230-11 | 07/23/20 | 08:36 | AWKD07/28/20 | AQ | Ground Water | VAP-P2-NV170_18.5-23.5 |
| FA77230-12 | 07/23/20 | 14:13 | AWKD07/28/20 | AQ | Ground Water | VAP-P6-OL211_1-6       |

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



## Sample Summary (continued)

**Arcadis**

**Job No: FA77230**

**Racer Lansing PFAS Delineation; Lansing, MI  
Project No: 30042872.03100**

| Sample Number | Collected |            | Matrix Code | Type | Client Sample ID  |                    |
|---------------|-----------|------------|-------------|------|-------------------|--------------------|
|               | Date      | Time By    |             |      |                   |                    |
| FA77230-13    | 07/23/20  | 14:45 AWKD | 07/28/20    | AQ   | Ground Water      | VAP-P6-OL211_33-38 |
| FA77230-14    | 07/23/20  | 17:50 AWKD | 07/28/20    | AQ   | Ground Water      | MW-20-130_072320   |
| FA77230-15    | 07/24/20  | 13:53 AWKD | 07/28/20    | AQ   | Ground Water      | VAP-P2-OP164_10-15 |
| FA77230-16    | 07/24/20  | 14:10 AWKD | 07/28/20    | AQ   | Ground Water      | VAP-P2-OP164_27-32 |
| FA77230-17    | 07/24/20  | 14:45 AWKD | 07/28/20    | AQ   | Ground Water      | VAP-P2-PP185_19-24 |
| FA77230-18    | 07/24/20  | 16:10 AWKD | 07/28/20    | AQ   | Field Blank Water | FB_072420          |

---

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## Summary of Hits

**Job Number:** FA77230  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 07/14/20 thru 07/24/20

| Lab Sample ID                    | Client Sample ID    | Result/<br>Qual | RL     | MDL    | Units | Method         |
|----------------------------------|---------------------|-----------------|--------|--------|-------|----------------|
| FA77230-1                        | SB-P2-OM185_0.6-1   |                 |        |        |       |                |
| Perfluorooctanesulfonic acid     |                     | 1.5             | 0.54   | 0.27   | ug/kg | EPA 537M BY ID |
| FA77230-2                        | SB-P2-OM185_9-9.5   |                 |        |        |       |                |
| Perfluorooctanesulfonic acid     |                     | 4.5             | 0.48   | 0.24   | ug/kg | EPA 537M BY ID |
| FA77230-3                        | SB-P2-OM185_19.5-20 |                 |        |        |       |                |
| No hits reported in this sample. |                     |                 |        |        |       |                |
| FA77230-4                        | SB-P2-OM185_31-31.5 |                 |        |        |       |                |
| No hits reported in this sample. |                     |                 |        |        |       |                |
| FA77230-5                        | SB-P2-OM185_41-41.5 |                 |        |        |       |                |
| No hits reported in this sample. |                     |                 |        |        |       |                |
| FA77230-6                        | SB-P2-OM185_52-52.5 |                 |        |        |       |                |
| No hits reported in this sample. |                     |                 |        |        |       |                |
| FA77230-7                        | SB-P2-OM185_59.5-60 |                 |        |        |       |                |
| No hits reported in this sample. |                     |                 |        |        |       |                |
| FA77230-8                        | VAP-P6-PG211_4-9    |                 |        |        |       |                |
| Perfluorobutanoic acid           |                     | 0.0243          | 0.0080 | 0.0020 | ug/l  | EPA 537M BY ID |
| Perfluoropentanoic acid          |                     | 0.0540          | 0.0040 | 0.0015 | ug/l  | EPA 537M BY ID |
| Perfluorohexanoic acid           |                     | 0.0500          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| Perfluoroheptanoic acid          |                     | 0.0496          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| Perfluorooctanoic acid           |                     | 0.0982          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| Perfluorononanoic acid           |                     | 0.0135          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| Perfluorodecanoic acid           |                     | 0.0107          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| Perfluorobutanesulfonic acid     |                     | 0.0020 J        | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| Perfluorohexanesulfonic acid     |                     | 0.0011 J        | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| Perfluorooctanesulfonic acid     |                     | 0.0489          | 0.0040 | 0.0015 | ug/l  | EPA 537M BY ID |
| PFOSA                            |                     | 0.0018 J        | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
| FA77230-9                        | DUP-01              |                 |        |        |       |                |
| Perfluorobutanoic acid           |                     | 0.0242          | 0.0080 | 0.0020 | ug/l  | EPA 537M BY ID |

## Summary of Hits

Job Number: FA77230  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 07/14/20 thru 07/24/20

2

| Lab Sample ID | Client Sample ID | Result/<br>Qual | RL     | MDL    | Units | Method         |
|---------------|------------------|-----------------|--------|--------|-------|----------------|
|               |                  | 0.0535          | 0.0040 | 0.0015 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0508          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0502          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0986          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0132          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0104          | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0016 J        | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0461          | 0.0040 | 0.0015 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0014 J        | 0.0040 | 0.0010 | ug/l  | EPA 537M BY ID |

FA77230-10 VAP-P2-NV170\_6-11

|  |  |          |        |        |      |                |
|--|--|----------|--------|--------|------|----------------|
|  |  | 0.0128   | 0.0080 | 0.0020 | ug/l | EPA 537M BY ID |
|  |  | 0.0193   | 0.0040 | 0.0015 | ug/l | EPA 537M BY ID |
|  |  | 0.0174   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0144   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0288   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0035 J | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0021 J | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0047   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0073   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0627   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0047   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.137    | 0.0040 | 0.0015 | ug/l | EPA 537M BY ID |
|  |  | 0.0029 J | 0.0080 | 0.0020 | ug/l | EPA 537M BY ID |

FA77230-11 VAP-P2-NV170\_18.5-23.5

|  |  |          |        |        |      |                |
|--|--|----------|--------|--------|------|----------------|
|  |  | 0.0183   | 0.0080 | 0.0020 | ug/l | EPA 537M BY ID |
|  |  | 0.0170   | 0.0040 | 0.0015 | ug/l | EPA 537M BY ID |
|  |  | 0.0210   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0151   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0297   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0031 J | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0025 J | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.180    | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0164   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0238   | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0025 J | 0.0040 | 0.0010 | ug/l | EPA 537M BY ID |
|  |  | 0.0454   | 0.0040 | 0.0015 | ug/l | EPA 537M BY ID |

FA77230-12 VAP-P6-OL211\_1-6

|  |  |        |        |        |      |                |
|--|--|--------|--------|--------|------|----------------|
|  |  | 0.0219 | 0.0091 | 0.0023 | ug/l | EPA 537M BY ID |
|  |  | 0.0057 | 0.0045 | 0.0017 | ug/l | EPA 537M BY ID |

## Summary of Hits

Job Number: FA77230  
 Account: Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI  
 Collected: 07/14/20 thru 07/24/20

2

| Lab Sample ID | Client Sample ID | Result/<br>Qual | RL     | MDL    | Units | Method         |
|---------------|------------------|-----------------|--------|--------|-------|----------------|
|               |                  | 0.0052          | 0.0045 | 0.0011 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0042 J        | 0.0045 | 0.0011 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0057          | 0.0045 | 0.0011 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0021 J        | 0.0045 | 0.0011 | ug/l  | EPA 537M BY ID |
|               |                  | 0.0030 J        | 0.0045 | 0.0017 | ug/l  | EPA 537M BY ID |

FA77230-13 VAP-P6-OL211\_33-38

No hits reported in this sample.

FA77230-14 MW-20-130\_072320

|                              |          |        |         |      |                |
|------------------------------|----------|--------|---------|------|----------------|
| Perfluorobutanoic acid       | 0.0061 J | 0.0077 | 0.0019  | ug/l | EPA 537M BY ID |
| Perfluoropentanoic acid      | 0.0016 J | 0.0038 | 0.0014  | ug/l | EPA 537M BY ID |
| Perfluorohexanoic acid       | 0.0023 J | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluorobutanesulfonic acid | 0.0101   | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |

FA77230-15 VAP-P2-OP164\_10-15

|                              |          |        |         |      |                |
|------------------------------|----------|--------|---------|------|----------------|
| Perfluorobutanoic acid       | 0.0781   | 0.0077 | 0.0019  | ug/l | EPA 537M BY ID |
| Perfluoropentanoic acid      | 0.0294   | 0.0038 | 0.0014  | ug/l | EPA 537M BY ID |
| Perfluorohexanoic acid       | 0.0228   | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluoroheptanoic acid      | 0.0086   | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid       | 0.0214   | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid | 0.0063   | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluorooctanesulfonic acid | 0.0020 J | 0.0038 | 0.0014  | ug/l | EPA 537M BY ID |
| 6:2 Fluorotelomer sulfonate  | 0.0064 J | 0.0077 | 0.0019  | ug/l | EPA 537M BY ID |

FA77230-16 VAP-P2-OP164\_27-32

|                                     |          |        |         |      |                |
|-------------------------------------|----------|--------|---------|------|----------------|
| Perfluorobutanoic acid <sup>a</sup> | 0.0289   | 0.0077 | 0.0019  | ug/l | EPA 537M BY ID |
| Perfluoropentanoic acid             | 0.0036 J | 0.0038 | 0.0014  | ug/l | EPA 537M BY ID |
| Perfluorohexanoic acid              | 0.0028 J | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluoroheptanoic acid             | 0.0019 J | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid              | 0.0089   | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluorohexanesulfonic acid        | 0.0017 J | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |
| Perfluorooctanesulfonic acid        | 0.0043   | 0.0038 | 0.0014  | ug/l | EPA 537M BY ID |
| 6:2 Fluorotelomer sulfonate         | 0.0043 J | 0.0077 | 0.0019  | ug/l | EPA 537M BY ID |

FA77230-17 VAP-P2-PP185\_19-24

|                        |          |        |         |      |                |
|------------------------|----------|--------|---------|------|----------------|
| Perfluorobutanoic acid | 0.0041 J | 0.0077 | 0.0019  | ug/l | EPA 537M BY ID |
| Perfluorooctanoic acid | 0.0016 J | 0.0038 | 0.00096 | ug/l | EPA 537M BY ID |

## Summary of Hits

**Job Number:** FA77230  
**Account:** Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI  
**Collected:** 07/14/20 thru 07/24/20

| Lab Sample ID | Client Sample ID | Result/<br>Qual | RL | MDL | Units | Method |
|---------------|------------------|-----------------|----|-----|-------|--------|
|---------------|------------------|-----------------|----|-----|-------|--------|

FA77230-18      FB\_072420

No hits reported in this sample.

(a) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

## Sample Results

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## Report of Analysis

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# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_0.6-1                  |                                |
| <b>Lab Sample ID:</b> FA77230-1                             | <b>Date Sampled:</b> 07/14/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 91.2    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID  | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q4440.D | 1  | 08/11/20 22:39 | NAF | 08/10/20 08:00 | OP81492    | S4Q62            |
| Run #2 |          |    |                |     |                |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 2.02 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL   | MDL  | Units | Q |
|--|-------------------------------|--------|------|------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |      |      |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 1.1  | 0.41 | ug/kg |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.54 | 0.27 | ug/kg |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.54 | 0.27 | ug/kg |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.54 | 0.27 | ug/kg |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.54 | 0.27 | ug/kg |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.54 | 0.29 | ug/kg |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.54 | 0.27 | ug/kg |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |      |      |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.54 | 0.27 | ug/kg |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.54 | 0.27 | ug/kg |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | 1.5    | 0.54 | 0.27 | ug/kg |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |      |      |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.54 | 0.27 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |      |      |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 1.1  | 0.54 | ug/kg |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 1.1  | 0.54 | ug/kg |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |      |      |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 1.1  | 0.27 | ug/kg |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 1.1  | 0.27 | ug/kg |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.1  
3

|                   |   |                 |          |
|-------------------|---|-----------------|----------|
| Client Sample ID: | SB-P2-OM185_0.6-1                           | Date Sampled:   | 07/14/20 |
| Lab Sample ID:    | FA77230-1                                   | Date Received:  | 07/28/20 |
| Matrix:           | SO - Soil                                   | Percent Solids: | 91.2     |
| Method:           | EPA 537M BY ID IN HOUSE                     |                 |          |
| Project:          | Racer Lansing PFAS Delineation; Lansing, MI |                 |          |

| CAS No.    | Compound                    | Result | RL  | MDL  | Units | Q |
|------------|-----------------------------|--------|-----|------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 1.1 | 0.27 | ug/kg |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |      |      |       |  |
|-------------|----------------------------|----|------|------|-------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 2.7  | 0.54 | ug/kg |  |
| 919005-14-4 | ADONA                      | ND | 0.54 | 0.27 | ug/kg |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.54 | 0.31 | ug/kg |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.54 | 0.28 | ug/kg |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 75%    |        | 40-140% |
|         | 13C5-PFPeA             | 83%    |        | 50-150% |
|         | 13C5-PFHxA             | 85%    |        | 50-150% |
|         | 13C4-PFHpA             | 87%    |        | 50-150% |
|         | 13C8-PFOA              | 88%    |        | 50-150% |
|         | 13C9-PFNA              | 86%    |        | 50-150% |
|         | 13C6-PFDA              | 86%    |        | 50-150% |
|         | 13C7-PFUnDA            | 84%    |        | 40-140% |
|         | 13C2-PFDoDA            | 80%    |        | 40-140% |
|         | 13C2-PFTeDA            | 86%    |        | 30-130% |
|         | 13C3-PFBS              | 88%    |        | 50-150% |
|         | 13C3-PFHxS             | 88%    |        | 50-150% |
|         | 13C8-PFOS              | 84%    |        | 50-150% |
|         | 13C8-FOSA              | 96%    |        | 30-130% |
|         | d3-MeFOSAA             | 84%    |        | 50-150% |
|         | 13C2-4:2FTS            | 81%    |        | 50-150% |
|         | 13C2-6:2FTS            | 86%    |        | 50-150% |
|         | 13C2-8:2FTS            | 80%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 79%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_9-9.5                  |                                |
| <b>Lab Sample ID:</b> FA77230-2                             | <b>Date Sampled:</b> 07/14/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 86.7    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID  | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q4441.D | 1  | 08/11/20 22:55 | NAF | 08/10/20 08:00 | OP81492    | S4Q62            |
| Run #2 |          |    |                |     |                |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 2.42 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL   | MDL  | Units | Q |
|--|-------------------------------|--------|------|------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |      |      |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 0.95 | 0.36 | ug/kg |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.48 | 0.24 | ug/kg |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.48 | 0.24 | ug/kg |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.48 | 0.24 | ug/kg |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.48 | 0.24 | ug/kg |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.48 | 0.25 | ug/kg |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.48 | 0.24 | ug/kg |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |      |      |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.48 | 0.24 | ug/kg |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.48 | 0.24 | ug/kg |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | 4.5    | 0.48 | 0.24 | ug/kg |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |      |      |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.48 | 0.24 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |      |      |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 0.95 | 0.48 | ug/kg |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 0.95 | 0.48 | ug/kg |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |      |      |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 0.95 | 0.24 | ug/kg |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 0.95 | 0.24 | ug/kg |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

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3

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_9-9.5                  |                                |
| <b>Lab Sample ID:</b> FA77230-2                             | <b>Date Sampled:</b> 07/14/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 86.7    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL   | MDL  | Units | Q |
|------------|-----------------------------|--------|------|------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.95 | 0.24 | ug/kg |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |      |      |       |  |
|-------------|----------------------------|----|------|------|-------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 2.4  | 0.48 | ug/kg |  |
| 919005-14-4 | ADONA                      | ND | 0.48 | 0.24 | ug/kg |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.48 | 0.28 | ug/kg |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.48 | 0.25 | ug/kg |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 80%    |        | 40-140% |
|         | 13C5-PFPeA             | 88%    |        | 50-150% |
|         | 13C5-PFHxA             | 90%    |        | 50-150% |
|         | 13C4-PFHpA             | 91%    |        | 50-150% |
|         | 13C8-PFOA              | 94%    |        | 50-150% |
|         | 13C9-PFNA              | 92%    |        | 50-150% |
|         | 13C6-PFDA              | 91%    |        | 50-150% |
|         | 13C7-PFUnDA            | 88%    |        | 40-140% |
|         | 13C2-PFDoDA            | 85%    |        | 40-140% |
|         | 13C2-PFTeDA            | 86%    |        | 30-130% |
|         | 13C3-PFBS              | 91%    |        | 50-150% |
|         | 13C3-PFHxS             | 94%    |        | 50-150% |
|         | 13C8-PFOS              | 91%    |        | 50-150% |
|         | 13C8-FOSA              | 101%   |        | 30-130% |
|         | d3-MeFOSAA             | 87%    |        | 50-150% |
|         | 13C2-4:2FTS            | 86%    |        | 50-150% |
|         | 13C2-6:2FTS            | 90%    |        | 50-150% |
|         | 13C2-8:2FTS            | 84%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 85%    |        | 50-150% |

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|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

### Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_19.5-20                |                                |
| <b>Lab Sample ID:</b> FA77230-3                             | <b>Date Sampled:</b> 07/14/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 83.9    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID  | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q4442.D | 1  | 08/11/20 23:11 | NAF | 08/10/20 08:00 | OP81492    | S4Q62            |
| Run #2 |          |    |                |     |                |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 2.62 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL   | MDL  | Units | Q |
|--|-------------------------------|--------|------|------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |      |      |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 0.91 | 0.35 | ug/kg |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.45 | 0.23 | ug/kg |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.45 | 0.23 | ug/kg |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.45 | 0.23 | ug/kg |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.45 | 0.23 | ug/kg |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.45 | 0.23 | ug/kg |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.45 | 0.23 | ug/kg |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.45 | 0.23 | ug/kg |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.45 | 0.23 | ug/kg |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.45 | 0.24 | ug/kg |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.45 | 0.23 | ug/kg |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |      |      |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.45 | 0.23 | ug/kg |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.45 | 0.23 | ug/kg |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.45 | 0.23 | ug/kg |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.45 | 0.23 | ug/kg |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | ND     | 0.45 | 0.23 | ug/kg |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.45 | 0.23 | ug/kg |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.45 | 0.23 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |      |      |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.45 | 0.23 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |      |      |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 0.91 | 0.45 | ug/kg |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 0.91 | 0.45 | ug/kg |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |      |      |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 0.91 | 0.23 | ug/kg |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 0.91 | 0.23 | ug/kg |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_19.5-20                |                                |
| <b>Lab Sample ID:</b> FA77230-3                             | <b>Date Sampled:</b> 07/14/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 83.9    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL   | MDL  | Units | Q |
|------------|-----------------------------|--------|------|------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.91 | 0.23 | ug/kg |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |      |      |       |  |
|-------------|----------------------------|----|------|------|-------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 2.3  | 0.45 | ug/kg |  |
| 919005-14-4 | ADONA                      | ND | 0.45 | 0.23 | ug/kg |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.45 | 0.26 | ug/kg |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.45 | 0.24 | ug/kg |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 73%    |        | 40-140% |
|         | 13C5-PFPeA             | 86%    |        | 50-150% |
|         | 13C5-PFHxA             | 89%    |        | 50-150% |
|         | 13C4-PFHpA             | 89%    |        | 50-150% |
|         | 13C8-PFOA              | 93%    |        | 50-150% |
|         | 13C9-PFNA              | 91%    |        | 50-150% |
|         | 13C6-PFDA              | 89%    |        | 50-150% |
|         | 13C7-PFUnDA            | 85%    |        | 40-140% |
|         | 13C2-PFDoDA            | 83%    |        | 40-140% |
|         | 13C2-PFTeDA            | 84%    |        | 30-130% |
|         | 13C3-PFBS              | 90%    |        | 50-150% |
|         | 13C3-PFHxS             | 92%    |        | 50-150% |
|         | 13C8-PFOS              | 91%    |        | 50-150% |
|         | 13C8-FOSA              | 100%   |        | 30-130% |
|         | d3-MeFOSAA             | 85%    |        | 50-150% |
|         | 13C2-4:2FTS            | 85%    |        | 50-150% |
|         | 13C2-6:2FTS            | 90%    |        | 50-150% |
|         | 13C2-8:2FTS            | 85%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 81%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_31-31.5                |                                |
| <b>Lab Sample ID:</b> FA77230-4                             | <b>Date Sampled:</b> 07/14/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 81.7    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID  | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q4443.D | 1  | 08/11/20 23:26 | NAF | 08/10/20 08:00 | OP81492    | S4Q62            |
| Run #2 |          |    |                |     |                |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 2.11 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL   | MDL  | Units | Q |
|--|-------------------------------|--------|------|------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |      |      |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 1.2  | 0.44 | ug/kg |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.58 | 0.29 | ug/kg |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.58 | 0.29 | ug/kg |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.58 | 0.29 | ug/kg |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.58 | 0.29 | ug/kg |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.58 | 0.29 | ug/kg |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.58 | 0.29 | ug/kg |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.58 | 0.29 | ug/kg |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.58 | 0.29 | ug/kg |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.58 | 0.31 | ug/kg |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.58 | 0.29 | ug/kg |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |      |      |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.58 | 0.29 | ug/kg |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.58 | 0.29 | ug/kg |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.58 | 0.29 | ug/kg |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.58 | 0.29 | ug/kg |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | ND     | 0.58 | 0.29 | ug/kg |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.58 | 0.29 | ug/kg |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.58 | 0.29 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |      |      |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.58 | 0.29 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |      |      |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 1.2  | 0.58 | ug/kg |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 1.2  | 0.58 | ug/kg |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |      |      |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 1.2  | 0.29 | ug/kg |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 1.2  | 0.29 | ug/kg |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_31-31.5                |                                |
| <b>Lab Sample ID:</b> FA77230-4                             | <b>Date Sampled:</b> 07/14/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 81.7    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL  | MDL  | Units | Q |
|------------|-----------------------------|--------|-----|------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 1.2 | 0.29 | ug/kg |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |      |      |       |  |
|-------------|----------------------------|----|------|------|-------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 2.9  | 0.58 | ug/kg |  |
| 919005-14-4 | ADONA                      | ND | 0.58 | 0.29 | ug/kg |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.58 | 0.34 | ug/kg |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.58 | 0.30 | ug/kg |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 80%    |        | 40-140% |
|         | 13C5-PFPeA             | 93%    |        | 50-150% |
|         | 13C5-PFHxA             | 97%    |        | 50-150% |
|         | 13C4-PFHpA             | 97%    |        | 50-150% |
|         | 13C8-PFOA              | 102%   |        | 50-150% |
|         | 13C9-PFNA              | 99%    |        | 50-150% |
|         | 13C6-PFDA              | 98%    |        | 50-150% |
|         | 13C7-PFUnDA            | 93%    |        | 40-140% |
|         | 13C2-PFDoDA            | 90%    |        | 40-140% |
|         | 13C2-PFTeDA            | 91%    |        | 30-130% |
|         | 13C3-PFBS              | 98%    |        | 50-150% |
|         | 13C3-PFHxS             | 99%    |        | 50-150% |
|         | 13C8-PFOS              | 98%    |        | 50-150% |
|         | 13C8-FOSA              | 109%   |        | 30-130% |
|         | d3-MeFOSAA             | 94%    |        | 50-150% |
|         | 13C2-4:2FTS            | 92%    |        | 50-150% |
|         | 13C2-6:2FTS            | 97%    |        | 50-150% |
|         | 13C2-8:2FTS            | 90%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 91%    |        | 50-150% |

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|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_41-41.5                |                                |
| <b>Lab Sample ID:</b> FA77230-5                             | <b>Date Sampled:</b> 07/17/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 90.1    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID  | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q4444.D | 1  | 08/11/20 23:42 | NAF | 08/10/20 08:00 | OP81492    | S4Q62            |
| Run #2 |          |    |                |     |                |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 2.06 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL   | MDL  | Units | Q |
|--|-------------------------------|--------|------|------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |      |      |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 1.1  | 0.41 | ug/kg |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.54 | 0.27 | ug/kg |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.54 | 0.27 | ug/kg |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.54 | 0.27 | ug/kg |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.54 | 0.27 | ug/kg |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.54 | 0.27 | ug/kg |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.54 | 0.29 | ug/kg |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.54 | 0.27 | ug/kg |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |      |      |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.54 | 0.27 | ug/kg |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.54 | 0.27 | ug/kg |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.54 | 0.27 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |      |      |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.54 | 0.27 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |      |      |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 1.1  | 0.54 | ug/kg |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 1.1  | 0.54 | ug/kg |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |      |      |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 1.1  | 0.27 | ug/kg |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 1.1  | 0.27 | ug/kg |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|                   |   |                 |          |
|-------------------|---|-----------------|----------|
| Client Sample ID: | SB-P2-OM185_41-41.5                         | Date Sampled:   | 07/17/20 |
| Lab Sample ID:    | FA77230-5                                   | Date Received:  | 07/28/20 |
| Matrix:           | SO - Soil                                   | Percent Solids: | 90.1     |
| Method:           | EPA 537M BY ID IN HOUSE                     |                 |          |
| Project:          | Racer Lansing PFAS Delineation; Lansing, MI |                 |          |

| CAS No.    | Compound                    | Result | RL  | MDL  | Units | Q |
|------------|-----------------------------|--------|-----|------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 1.1 | 0.27 | ug/kg |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |      |      |       |  |
|-------------|----------------------------|----|------|------|-------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 2.7  | 0.54 | ug/kg |  |
| 919005-14-4 | ADONA                      | ND | 0.54 | 0.27 | ug/kg |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.54 | 0.31 | ug/kg |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.54 | 0.28 | ug/kg |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 75%    |        | 40-140% |
|         | 13C5-PFPeA             | 84%    |        | 50-150% |
|         | 13C5-PFHxA             | 87%    |        | 50-150% |
|         | 13C4-PFHpA             | 88%    |        | 50-150% |
|         | 13C8-PFOA              | 90%    |        | 50-150% |
|         | 13C9-PFNA              | 88%    |        | 50-150% |
|         | 13C6-PFDA              | 87%    |        | 50-150% |
|         | 13C7-PFUnDA            | 85%    |        | 40-140% |
|         | 13C2-PFDoDA            | 83%    |        | 40-140% |
|         | 13C2-PFTeDA            | 84%    |        | 30-130% |
|         | 13C3-PFBS              | 89%    |        | 50-150% |
|         | 13C3-PFHxS             | 89%    |        | 50-150% |
|         | 13C8-PFOS              | 86%    |        | 50-150% |
|         | 13C8-FOSA              | 98%    |        | 30-130% |
|         | d3-MeFOSAA             | 86%    |        | 50-150% |
|         | 13C2-4:2FTS            | 82%    |        | 50-150% |
|         | 13C2-6:2FTS            | 87%    |        | 50-150% |
|         | 13C2-8:2FTS            | 82%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 82%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_52-52.5                |                                |
| <b>Lab Sample ID:</b> FA77230-6                             | <b>Date Sampled:</b> 07/17/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 96.1    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID  | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q4445.D | 1  | 08/11/20 23:57 | NAF | 08/10/20 08:00 | OP81492    | S4Q62            |
| Run #2 |          |    |                |     |                |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 2.16 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL   | MDL  | Units | Q |
|--|-------------------------------|--------|------|------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |      |      |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 0.96 | 0.37 | ug/kg |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.48 | 0.24 | ug/kg |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.48 | 0.24 | ug/kg |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.48 | 0.24 | ug/kg |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.48 | 0.24 | ug/kg |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.48 | 0.24 | ug/kg |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.48 | 0.26 | ug/kg |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.48 | 0.24 | ug/kg |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |      |      |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.48 | 0.24 | ug/kg |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.48 | 0.24 | ug/kg |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.48 | 0.24 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |      |      |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.48 | 0.24 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |      |      |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 0.96 | 0.48 | ug/kg |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 0.96 | 0.48 | ug/kg |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |      |      |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 0.96 | 0.24 | ug/kg |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 0.96 | 0.24 | ug/kg |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_52-52.5                |                                |
| <b>Lab Sample ID:</b> FA77230-6                             | <b>Date Sampled:</b> 07/17/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 96.1    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL   | MDL  | Units | Q |
|------------|-----------------------------|--------|------|------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.96 | 0.24 | ug/kg |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |      |      |       |  |
|-------------|----------------------------|----|------|------|-------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 2.4  | 0.48 | ug/kg |  |
| 919005-14-4 | ADONA                      | ND | 0.48 | 0.24 | ug/kg |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.48 | 0.28 | ug/kg |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.48 | 0.25 | ug/kg |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 77%    |        | 40-140% |
|         | 13C5-PFPeA             | 91%    |        | 50-150% |
|         | 13C5-PFHxA             | 94%    |        | 50-150% |
|         | 13C4-PFHpA             | 94%    |        | 50-150% |
|         | 13C8-PFOA              | 98%    |        | 50-150% |
|         | 13C9-PFNA              | 95%    |        | 50-150% |
|         | 13C6-PFDA              | 92%    |        | 50-150% |
|         | 13C7-PFUnDA            | 90%    |        | 40-140% |
|         | 13C2-PFDoDA            | 88%    |        | 40-140% |
|         | 13C2-PFTeDA            | 89%    |        | 30-130% |
|         | 13C3-PFBS              | 96%    |        | 50-150% |
|         | 13C3-PFHxS             | 95%    |        | 50-150% |
|         | 13C8-PFOS              | 96%    |        | 50-150% |
|         | 13C8-FOSA              | 107%   |        | 30-130% |
|         | d3-MeFOSAA             | 90%    |        | 50-150% |
|         | 13C2-4:2FTS            | 89%    |        | 50-150% |
|         | 13C2-6:2FTS            | 94%    |        | 50-150% |
|         | 13C2-8:2FTS            | 88%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 88%    |        | 50-150% |

---

|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_59.5-60                |                                |
| <b>Lab Sample ID:</b> FA77230-7                             | <b>Date Sampled:</b> 07/17/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 93.1    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID  | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 4Q4448.D | 1  | 08/12/20 00:44 | NAF | 08/10/20 08:00 | OP81492    | S4Q62            |
| Run #2 |          |    |                |     |                |            |                  |

| Run #  | Initial Weight | Final Volume |
|--------|----------------|--------------|
| Run #1 | 2.01 g         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL   | MDL  | Units | Q |
|--|-------------------------------|--------|------|------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |      |      |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 1.1  | 0.41 | ug/kg |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.53 | 0.27 | ug/kg |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.53 | 0.27 | ug/kg |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.53 | 0.27 | ug/kg |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.53 | 0.27 | ug/kg |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.53 | 0.27 | ug/kg |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.53 | 0.27 | ug/kg |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.53 | 0.27 | ug/kg |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.53 | 0.27 | ug/kg |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.53 | 0.28 | ug/kg |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.53 | 0.27 | ug/kg |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |      |      |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.53 | 0.27 | ug/kg |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.53 | 0.27 | ug/kg |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.53 | 0.27 | ug/kg |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.53 | 0.27 | ug/kg |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | ND     | 0.53 | 0.27 | ug/kg |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.53 | 0.27 | ug/kg |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.53 | 0.27 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |      |      |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.53 | 0.27 | ug/kg |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |      |      |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 1.1  | 0.53 | ug/kg |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 1.1  | 0.53 | ug/kg |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |      |      |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 1.1  | 0.27 | ug/kg |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 1.1  | 0.27 | ug/kg |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> SB-P2-OM185_59.5-60                |                                |
| <b>Lab Sample ID:</b> FA77230-7                             | <b>Date Sampled:</b> 07/17/20  |
| <b>Matrix:</b> SO - Soil                                    | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID IN HOUSE                      | <b>Percent Solids:</b> 93.1    |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL  | MDL  | Units | Q |
|------------|-----------------------------|--------|-----|------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 1.1 | 0.27 | ug/kg |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |      |      |       |  |
|-------------|----------------------------|----|------|------|-------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 2.7  | 0.53 | ug/kg |  |
| 919005-14-4 | ADONA                      | ND | 0.53 | 0.27 | ug/kg |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.53 | 0.31 | ug/kg |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.53 | 0.28 | ug/kg |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 71%    |        | 40-140% |
|         | 13C5-PFPeA             | 83%    |        | 50-150% |
|         | 13C5-PFHxA             | 86%    |        | 50-150% |
|         | 13C4-PFHpA             | 86%    |        | 50-150% |
|         | 13C8-PFOA              | 90%    |        | 50-150% |
|         | 13C9-PFNA              | 87%    |        | 50-150% |
|         | 13C6-PFDA              | 86%    |        | 50-150% |
|         | 13C7-PFUnDA            | 82%    |        | 40-140% |
|         | 13C2-PFDoDA            | 79%    |        | 40-140% |
|         | 13C2-PFTeDA            | 83%    |        | 30-130% |
|         | 13C3-PFBS              | 87%    |        | 50-150% |
|         | 13C3-PFHxS             | 87%    |        | 50-150% |
|         | 13C8-PFOS              | 86%    |        | 50-150% |
|         | 13C8-FOSA              | 97%    |        | 30-130% |
|         | d3-MeFOSAA             | 83%    |        | 50-150% |
|         | 13C2-4:2FTS            | 82%    |        | 50-150% |
|         | 13C2-6:2FTS            | 85%    |        | 50-150% |
|         | 13C2-8:2FTS            | 80%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 82%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P6-PG211_4-9                   |                                |
| <b>Lab Sample ID:</b> FA77230-8                             | <b>Date Sampled:</b> 07/20/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52171.D | 1  | 08/03/20 18:29 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 250 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |        |        |        |      |  |
|------------|-----------------------------|--------|--------|--------|------|--|
| 375-22-4   | Perfluorobutanoic acid      | 0.0243 | 0.0080 | 0.0020 | ug/l |  |
| 2706-90-3  | Perfluoropentanoic acid     | 0.0540 | 0.0040 | 0.0015 | ug/l |  |
| 307-24-4   | Perfluorohexanoic acid      | 0.0500 | 0.0040 | 0.0010 | ug/l |  |
| 375-85-9   | Perfluoroheptanoic acid     | 0.0496 | 0.0040 | 0.0010 | ug/l |  |
| 335-67-1   | Perfluorooctanoic acid      | 0.0982 | 0.0040 | 0.0010 | ug/l |  |
| 375-95-1   | Perfluorononanoic acid      | 0.0135 | 0.0040 | 0.0010 | ug/l |  |
| 335-76-2   | Perfluorodecanoic acid      | 0.0107 | 0.0040 | 0.0010 | ug/l |  |
| 2058-94-8  | Perfluoroundecanoic acid    | ND     | 0.0040 | 0.0010 | ug/l |  |
| 307-55-1   | Perfluorododecanoic acid    | ND     | 0.0040 | 0.0015 | ug/l |  |
| 72629-94-8 | Perfluorotridecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l |  |
| 376-06-7   | Perfluorotetradecanoic acid | ND     | 0.0040 | 0.0010 | ug/l |  |

**PERFLUOROALKYL SULFONATES**

|            |                               |        |        |        |      |   |
|------------|-------------------------------|--------|--------|--------|------|---|
| 375-73-5   | Perfluorobutanesulfonic acid  | 0.0020 | 0.0040 | 0.0010 | ug/l | J |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l |   |
| 355-46-4   | Perfluorohexanesulfonic acid  | 0.0011 | 0.0040 | 0.0010 | ug/l | J |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l |   |
| 1763-23-1  | Perfluorooctanesulfonic acid  | 0.0489 | 0.0040 | 0.0015 | ug/l |   |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |   |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |   |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |        |        |        |      |   |
|----------|-------|--------|--------|--------|------|---|
| 754-91-6 | PFOSA | 0.0018 | 0.0040 | 0.0010 | ug/l | J |
|----------|-------|--------|--------|--------|------|---|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0080 | 0.0020 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0080 | 0.0020 | ug/l |  |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P6-PG211_4-9                   |                                |
| <b>Lab Sample ID:</b> FA77230-8                             | <b>Date Sampled:</b> 07/20/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0080 | 0.0020 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.020  | 0.0050 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0080 | 0.0020 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0080 | 0.0020 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0080 | 0.0020 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 88%    |        | 35-135% |
|         | 13C5-PFPeA             | 86%    |        | 50-150% |
|         | 13C5-PFHxA             | 86%    |        | 50-150% |
|         | 13C4-PFHpA             | 86%    |        | 50-150% |
|         | 13C8-PFOA              | 89%    |        | 50-150% |
|         | 13C9-PFNA              | 102%   |        | 50-150% |
|         | 13C6-PFDA              | 83%    |        | 50-150% |
|         | 13C7-PFUnDA            | 78%    |        | 40-140% |
|         | 13C2-PFDoDA            | 71%    |        | 40-140% |
|         | 13C2-PFTeDA            | 59%    |        | 30-130% |
|         | 13C3-PFBS              | 83%    |        | 50-150% |
|         | 13C3-PFHxS             | 80%    |        | 50-150% |
|         | 13C8-PFOS              | 77%    |        | 50-150% |
|         | 13C8-FOSA              | 63%    |        | 30-130% |
|         | d3-MeFOSAA             | 87%    |        | 50-150% |
|         | 13C2-4:2FTS            | 93%    |        | 50-150% |
|         | 13C2-6:2FTS            | 95%    |        | 50-150% |
|         | 13C2-8:2FTS            | 85%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 91%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |  |                                |
|---|--|--------------------------------|
| <b>Client Sample ID:</b> DUP-01                             |  |                                |
| <b>Lab Sample ID:</b> FA77230-9                             |  | <b>Date Sampled:</b> 07/20/20  |
| <b>Matrix:</b> AQ - Ground Water                            |  | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   |  | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |  |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52172.D | 1  | 08/03/20 18:44 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 250 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |        |        |        |      |  |
|------------|-----------------------------|--------|--------|--------|------|--|
| 375-22-4   | Perfluorobutanoic acid      | 0.0242 | 0.0080 | 0.0020 | ug/l |  |
| 2706-90-3  | Perfluoropentanoic acid     | 0.0535 | 0.0040 | 0.0015 | ug/l |  |
| 307-24-4   | Perfluorohexanoic acid      | 0.0508 | 0.0040 | 0.0010 | ug/l |  |
| 375-85-9   | Perfluoroheptanoic acid     | 0.0502 | 0.0040 | 0.0010 | ug/l |  |
| 335-67-1   | Perfluorooctanoic acid      | 0.0986 | 0.0040 | 0.0010 | ug/l |  |
| 375-95-1   | Perfluorononanoic acid      | 0.0132 | 0.0040 | 0.0010 | ug/l |  |
| 335-76-2   | Perfluorodecanoic acid      | 0.0104 | 0.0040 | 0.0010 | ug/l |  |
| 2058-94-8  | Perfluoroundecanoic acid    | ND     | 0.0040 | 0.0010 | ug/l |  |
| 307-55-1   | Perfluorododecanoic acid    | ND     | 0.0040 | 0.0015 | ug/l |  |
| 72629-94-8 | Perfluorotridecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l |  |
| 376-06-7   | Perfluorotetradecanoic acid | ND     | 0.0040 | 0.0010 | ug/l |  |

**PERFLUOROALKYL SULFONATES**

|            |                               |        |        |        |      |   |
|------------|-------------------------------|--------|--------|--------|------|---|
| 375-73-5   | Perfluorobutanesulfonic acid  | 0.0016 | 0.0040 | 0.0010 | ug/l | J |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l |   |
| 355-46-4   | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |   |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l |   |
| 1763-23-1  | Perfluorooctanesulfonic acid  | 0.0461 | 0.0040 | 0.0015 | ug/l |   |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |   |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |   |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |        |        |        |      |   |
|----------|-------|--------|--------|--------|------|---|
| 754-91-6 | PFOSA | 0.0014 | 0.0040 | 0.0010 | ug/l | J |
|----------|-------|--------|--------|--------|------|---|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0080 | 0.0020 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0080 | 0.0020 | ug/l |  |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

3.9  
3

|   |  |                                |
|---|--|--------------------------------|
| <b>Client Sample ID:</b> DUP-01                             |  | <b>Date Sampled:</b> 07/20/20  |
| <b>Lab Sample ID:</b> FA77230-9                             |  | <b>Date Received:</b> 07/28/20 |
| <b>Matrix:</b> AQ - Ground Water                            |  | <b>Percent Solids:</b> n/a     |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   |  |                                |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |  |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0080 | 0.0020 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.020  | 0.0050 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0080 | 0.0020 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0080 | 0.0020 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUds (F-53B Minor) | ND | 0.0080 | 0.0020 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 85%    |        | 35-135% |
|         | 13C5-PFPeA             | 84%    |        | 50-150% |
|         | 13C5-PFHxA             | 82%    |        | 50-150% |
|         | 13C4-PFHpA             | 83%    |        | 50-150% |
|         | 13C8-PFOA              | 89%    |        | 50-150% |
|         | 13C9-PFNA              | 100%   |        | 50-150% |
|         | 13C6-PFDA              | 80%    |        | 50-150% |
|         | 13C7-PFUnDA            | 81%    |        | 40-140% |
|         | 13C2-PFDoDA            | 72%    |        | 40-140% |
|         | 13C2-PFTeDA            | 49%    |        | 30-130% |
|         | 13C3-PFBS              | 83%    |        | 50-150% |
|         | 13C3-PFHxS             | 78%    |        | 50-150% |
|         | 13C8-PFOS              | 75%    |        | 50-150% |
|         | 13C8-FOSA              | 53%    |        | 30-130% |
|         | d3-MeFOSAA             | 87%    |        | 50-150% |
|         | 13C2-4:2FTS            | 87%    |        | 50-150% |
|         | 13C2-6:2FTS            | 96%    |        | 50-150% |
|         | 13C2-8:2FTS            | 87%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 89%    |        | 50-150% |

---

|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P2-NV170_6-11                  |                                |
| <b>Lab Sample ID:</b> FA77230-10                            | <b>Date Sampled:</b> 07/23/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52175.D | 1  | 08/03/20 19:28 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 250 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |        |        |        |      |   |
|------------|-----------------------------|--------|--------|--------|------|---|
| 375-22-4   | Perfluorobutanoic acid      | 0.0128 | 0.0080 | 0.0020 | ug/l |   |
| 2706-90-3  | Perfluoropentanoic acid     | 0.0193 | 0.0040 | 0.0015 | ug/l |   |
| 307-24-4   | Perfluorohexanoic acid      | 0.0174 | 0.0040 | 0.0010 | ug/l |   |
| 375-85-9   | Perfluoroheptanoic acid     | 0.0144 | 0.0040 | 0.0010 | ug/l |   |
| 335-67-1   | Perfluorooctanoic acid      | 0.0288 | 0.0040 | 0.0010 | ug/l |   |
| 375-95-1   | Perfluorononanoic acid      | 0.0035 | 0.0040 | 0.0010 | ug/l | J |
| 335-76-2   | Perfluorodecanoic acid      | 0.0021 | 0.0040 | 0.0010 | ug/l | J |
| 2058-94-8  | Perfluoroundecanoic acid    | ND     | 0.0040 | 0.0010 | ug/l |   |
| 307-55-1   | Perfluorododecanoic acid    | ND     | 0.0040 | 0.0015 | ug/l |   |
| 72629-94-8 | Perfluorotridecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l |   |
| 376-06-7   | Perfluorotetradecanoic acid | ND     | 0.0040 | 0.0010 | ug/l |   |

**PERFLUOROALKYL SULFONATES**

|            |                               |        |        |        |      |  |
|------------|-------------------------------|--------|--------|--------|------|--|
| 375-73-5   | Perfluorobutanesulfonic acid  | 0.0047 | 0.0040 | 0.0010 | ug/l |  |
| 2706-91-4  | Perfluoropentanesulfonic acid | 0.0073 | 0.0040 | 0.0010 | ug/l |  |
| 355-46-4   | Perfluorohexanesulfonic acid  | 0.0627 | 0.0040 | 0.0010 | ug/l |  |
| 375-92-8   | Perfluoroheptanesulfonic acid | 0.0047 | 0.0040 | 0.0010 | ug/l |  |
| 1763-23-1  | Perfluorooctanesulfonic acid  | 0.137  | 0.0040 | 0.0015 | ug/l |  |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |  |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |  |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |    |        |        |      |  |
|----------|-------|----|--------|--------|------|--|
| 754-91-6 | PFOSA | ND | 0.0040 | 0.0010 | ug/l |  |
|----------|-------|----|--------|--------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |
| 2991-50-6 | EiFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |        |        |        |      |   |
|-------------|-----------------------------|--------|--------|--------|------|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND     | 0.0080 | 0.0020 | ug/l |   |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | 0.0029 | 0.0080 | 0.0020 | ug/l | J |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P2-NV170_6-11                  |                                |
| <b>Lab Sample ID:</b> FA77230-10                            | <b>Date Sampled:</b> 07/23/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0080 | 0.0020 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.020  | 0.0050 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0080 | 0.0020 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0080 | 0.0020 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0080 | 0.0020 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 89%    |        | 35-135% |
|         | 13C5-PFPeA             | 85%    |        | 50-150% |
|         | 13C5-PFHxA             | 87%    |        | 50-150% |
|         | 13C4-PFHpA             | 85%    |        | 50-150% |
|         | 13C8-PFOA              | 94%    |        | 50-150% |
|         | 13C9-PFNA              | 102%   |        | 50-150% |
|         | 13C6-PFDA              | 85%    |        | 50-150% |
|         | 13C7-PFUnDA            | 83%    |        | 40-140% |
|         | 13C2-PFDoDA            | 82%    |        | 40-140% |
|         | 13C2-PFTeDA            | 74%    |        | 30-130% |
|         | 13C3-PFBS              | 83%    |        | 50-150% |
|         | 13C3-PFHxS             | 78%    |        | 50-150% |
|         | 13C8-PFOS              | 78%    |        | 50-150% |
|         | 13C8-FOSA              | 77%    |        | 30-130% |
|         | d3-MeFOSAA             | 92%    |        | 50-150% |
|         | 13C2-4:2FTS            | 92%    |        | 50-150% |
|         | 13C2-6:2FTS            | 103%   |        | 50-150% |
|         | 13C2-8:2FTS            | 90%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 89%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

|                   |   |                 |          |
|-------------------|---|-----------------|----------|
| Client Sample ID: | VAP-P2-NV170_18.5-23.5                      | Date Sampled:   | 07/23/20 |
| Lab Sample ID:    | FA77230-11                                  | Date Received:  | 07/28/20 |
| Matrix:           | AQ - Ground Water                           | Percent Solids: | n/a      |
| Method:           | EPA 537M BY ID EPA 537 MOD                  |                 |          |
| Project:          | Racer Lansing PFAS Delineation; Lansing, MI |                 |          |

| Run #               | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|---------------------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1              | 2Q52176.D | 1  | 08/03/20 19:43 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 <sup>a</sup> | 2Q52240.D | 5  | 08/04/20 16:59 | NAF | 07/31/20 10:30 | OP81355    | S2Q777           |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 250 ml         | 1.0 ml       |
| Run #2 | 250 ml         | 1.0 ml       |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

## PERFLUOROALKYL CARBOXYLIC ACIDS

|            |                             |        |        |        |      |   |
|------------|-----------------------------|--------|--------|--------|------|---|
| 375-22-4   | Perfluorobutanoic acid      | 0.0183 | 0.0080 | 0.0020 | ug/l |   |
| 2706-90-3  | Perfluoropentanoic acid     | 0.0170 | 0.0040 | 0.0015 | ug/l |   |
| 307-24-4   | Perfluorohexanoic acid      | 0.0210 | 0.0040 | 0.0010 | ug/l |   |
| 375-85-9   | Perfluoroheptanoic acid     | 0.0151 | 0.0040 | 0.0010 | ug/l |   |
| 335-67-1   | Perfluorooctanoic acid      | 0.0297 | 0.0040 | 0.0010 | ug/l |   |
| 375-95-1   | Perfluorononanoic acid      | 0.0031 | 0.0040 | 0.0010 | ug/l | J |
| 335-76-2   | Perfluorodecanoic acid      | 0.0025 | 0.0040 | 0.0010 | ug/l | J |
| 2058-94-8  | Perfluoroundecanoic acid    | ND     | 0.0040 | 0.0010 | ug/l |   |
| 307-55-1   | Perfluorododecanoic acid    | ND     | 0.0040 | 0.0015 | ug/l |   |
| 72629-94-8 | Perfluorotridecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l |   |
| 376-06-7   | Perfluorotetradecanoic acid | ND     | 0.0040 | 0.0010 | ug/l |   |

## PERFLUOROALKYL SULFONATES

|            |                               |        |        |        |      |   |
|------------|-------------------------------|--------|--------|--------|------|---|
| 375-73-5   | Perfluorobutanesulfonic acid  | 0.180  | 0.0040 | 0.0010 | ug/l |   |
| 2706-91-4  | Perfluoropentanesulfonic acid | 0.0164 | 0.0040 | 0.0010 | ug/l |   |
| 355-46-4   | Perfluorohexanesulfonic acid  | 0.0238 | 0.0040 | 0.0010 | ug/l |   |
| 375-92-8   | Perfluoroheptanesulfonic acid | 0.0025 | 0.0040 | 0.0010 | ug/l | J |
| 1763-23-1  | Perfluorooctanesulfonic acid  | 0.0454 | 0.0040 | 0.0015 | ug/l |   |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |   |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l |   |

## PERFLUORO OCTANESULFONAMIDES

|          |       |                 |       |        |      |  |
|----------|-------|-----------------|-------|--------|------|--|
| 754-91-6 | PFOSA | ND <sup>b</sup> | 0.020 | 0.0050 | ug/l |  |
|----------|-------|-----------------|-------|--------|------|--|

## PERFLUORO OCTANESULFONAMIDOACETIC ACIDS

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |
| 2991-50-6 | EiFOSAA | ND | 0.0080 | 0.0040 | ug/l |  |

## FLUOROTELOMER SULFONATES

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0080 | 0.0020 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0080 | 0.0020 | ug/l |  |

ND = Not detected MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

## Report of Analysis

|                   |   |                 |          |
|-------------------|---|-----------------|----------|
| Client Sample ID: | VAP-P2-NV170_18.5-23.5                      | Date Sampled:   | 07/23/20 |
| Lab Sample ID:    | FA77230-11                                  | Date Received:  | 07/28/20 |
| Matrix:           | AQ - Ground Water                           | Percent Solids: | n/a      |
| Method:           | EPA 537M BY ID EPA 537 MOD                  |                 |          |
| Project:          | Racer Lansing PFAS Delineation; Lansing, MI |                 |          |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0080 | 0.0020 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.020  | 0.0050 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0080 | 0.0020 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0080 | 0.0020 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0080 | 0.0020 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1           | Run# 2 | Limits  |
|---------|------------------------|------------------|--------|---------|
|         | 13C4-PFBA              | 62%              | 85%    | 35-135% |
|         | 13C5-PFPeA             | 61%              | 84%    | 50-150% |
|         | 13C5-PFHxA             | 58%              | 82%    | 50-150% |
|         | 13C4-PFHpA             | 60%              | 79%    | 50-150% |
|         | 13C8-PFOA              | 66%              | 85%    | 50-150% |
|         | 13C9-PFNA              | 78%              | 85%    | 50-150% |
|         | 13C6-PFDA              | 70%              | 82%    | 50-150% |
|         | 13C7-PFUnDA            | 70%              | 76%    | 40-140% |
|         | 13C2-PFDoDA            | 66%              | 73%    | 40-140% |
|         | 13C2-PFTeDA            | 69%              | 69%    | 30-130% |
|         | 13C3-PFBS              | 64%              | 87%    | 50-150% |
|         | 13C3-PFHxS             | 68%              | 83%    | 50-150% |
|         | 13C8-PFOS              | 71%              | 90%    | 50-150% |
|         | 13C8-FOSA              | 19% <sup>c</sup> | 38%    | 30-130% |
|         | d3-MeFOSAA             | 79%              | 99%    | 50-150% |
|         | 13C2-4:2FTS            | 74%              | 85%    | 50-150% |
|         | 13C2-6:2FTS            | 85%              | 94%    | 50-150% |
|         | 13C2-8:2FTS            | 92%              | 95%    | 50-150% |
|         | 13C3-HFPO-DA           | 67%              | 81%    | 50-150% |

(a) Dilution required due to matrix interference (ID recovery standard failure).

(b) Result is from Run# 2

(c) Outside control limits due to matrix interference.

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P6-OL211_1-6                   |                                |
| <b>Lab Sample ID:</b> FA77230-12                            | <b>Date Sampled:</b> 07/23/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52177.D | 1  | 08/03/20 19:57 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 220 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL     | MDL    | Units | Q |
|--|-------------------------------|--------|--------|--------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |        |        |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | 0.0219 | 0.0091 | 0.0023 | ug/l  |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | 0.0057 | 0.0045 | 0.0017 | ug/l  |   |
| 307-24-4                                       | Perfluorohexanoic acid        | 0.0052 | 0.0045 | 0.0011 | ug/l  |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | 0.0042 | 0.0045 | 0.0011 | ug/l  | J |
| 335-67-1                                       | Perfluorooctanoic acid        | 0.0057 | 0.0045 | 0.0011 | ug/l  |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.0045 | 0.0017 | ug/l  |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.0045 | 0.0011 | ug/l  |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |        |        |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | 0.0021 | 0.0045 | 0.0011 | ug/l  | J |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | 0.0030 | 0.0045 | 0.0017 | ug/l  | J |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.0045 | 0.0011 | ug/l  |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |        |        |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.0045 | 0.0011 | ug/l  |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |        |        |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 0.0091 | 0.0045 | ug/l  |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 0.0091 | 0.0045 | ug/l  |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |        |        |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 0.0091 | 0.0023 | ug/l  |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0091 | 0.0023 | ug/l  |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P6-OL211_1-6                   |                                |
| <b>Lab Sample ID:</b> FA77230-12                            | <b>Date Sampled:</b> 07/23/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0091 | 0.0023 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.023  | 0.0057 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0091 | 0.0023 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0091 | 0.0023 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0091 | 0.0023 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 91%    |        | 35-135% |
|         | 13C5-PFPeA             | 87%    |        | 50-150% |
|         | 13C5-PFHxA             | 85%    |        | 50-150% |
|         | 13C4-PFHpA             | 82%    |        | 50-150% |
|         | 13C8-PFOA              | 86%    |        | 50-150% |
|         | 13C9-PFNA              | 94%    |        | 50-150% |
|         | 13C6-PFDA              | 74%    |        | 50-150% |
|         | 13C7-PFUnDA            | 68%    |        | 40-140% |
|         | 13C2-PFDoDA            | 65%    |        | 40-140% |
|         | 13C2-PFTeDA            | 47%    |        | 30-130% |
|         | 13C3-PFBS              | 83%    |        | 50-150% |
|         | 13C3-PFHxS             | 77%    |        | 50-150% |
|         | 13C8-PFOS              | 72%    |        | 50-150% |
|         | 13C8-FOSA              | 73%    |        | 30-130% |
|         | d3-MeFOSAA             | 71%    |        | 50-150% |
|         | 13C2-4:2FTS            | 83%    |        | 50-150% |
|         | 13C2-6:2FTS            | 84%    |        | 50-150% |
|         | 13C2-8:2FTS            | 70%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 88%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P6-OL211_33-38                 |                                |
| <b>Lab Sample ID:</b> FA77230-13                            | <b>Date Sampled:</b> 07/23/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52178.D | 1  | 08/03/20 20:12 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 220 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL     | MDL    | Units | Q |
|--|-------------------------------|--------|--------|--------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |        |        |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | ND     | 0.0091 | 0.0023 | ug/l  |   |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.0045 | 0.0017 | ug/l  |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 335-67-1                                       | Perfluorooctanoic acid        | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.0045 | 0.0017 | ug/l  |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.0045 | 0.0011 | ug/l  |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |        |        |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | ND     | 0.0045 | 0.0017 | ug/l  |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.0045 | 0.0011 | ug/l  |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.0045 | 0.0011 | ug/l  |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |        |        |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.0045 | 0.0011 | ug/l  |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |        |        |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 0.0091 | 0.0045 | ug/l  |   |
| 2991-50-6                                      | EtFOSAA                       | ND     | 0.0091 | 0.0045 | ug/l  |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |        |        |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 0.0091 | 0.0023 | ug/l  |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0091 | 0.0023 | ug/l  |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|                   |   |                 |          |
|-------------------|---|-----------------|----------|
| Client Sample ID: | VAP-P6-OL211_33-38                          | Date Sampled:   | 07/23/20 |
| Lab Sample ID:    | FA77230-13                                  | Date Received:  | 07/28/20 |
| Matrix:           | AQ - Ground Water                           | Percent Solids: | n/a      |
| Method:           | EPA 537M BY ID EPA 537 MOD                  |                 |          |
| Project:          | Racer Lansing PFAS Delineation; Lansing, MI |                 |          |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0091 | 0.0023 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.023  | 0.0057 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0091 | 0.0023 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0091 | 0.0023 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0091 | 0.0023 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 84%    |        | 35-135% |
|         | 13C5-PFPeA             | 89%    |        | 50-150% |
|         | 13C5-PFHxA             | 89%    |        | 50-150% |
|         | 13C4-PFHpA             | 92%    |        | 50-150% |
|         | 13C8-PFOA              | 95%    |        | 50-150% |
|         | 13C9-PFNA              | 110%   |        | 50-150% |
|         | 13C6-PFDA              | 84%    |        | 50-150% |
|         | 13C7-PFUnDA            | 74%    |        | 40-140% |
|         | 13C2-PFDoDA            | 74%    |        | 40-140% |
|         | 13C2-PFTeDA            | 50%    |        | 30-130% |
|         | 13C3-PFBS              | 88%    |        | 50-150% |
|         | 13C3-PFHxS             | 88%    |        | 50-150% |
|         | 13C8-PFOS              | 81%    |        | 50-150% |
|         | 13C8-FOSA              | 76%    |        | 30-130% |
|         | d3-MeFOSAA             | 79%    |        | 50-150% |
|         | 13C2-4:2FTS            | 87%    |        | 50-150% |
|         | 13C2-6:2FTS            | 93%    |        | 50-150% |
|         | 13C2-8:2FTS            | 80%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 100%   |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> MW-20-130_072320                   |                                |
| <b>Lab Sample ID:</b> FA77230-14                            | <b>Date Sampled:</b> 07/23/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52179.D | 1  | 08/03/20 20:27 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 260 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |        |        |         |      |   |
|------------|-----------------------------|--------|--------|---------|------|---|
| 375-22-4   | Perfluorobutanoic acid      | 0.0061 | 0.0077 | 0.0019  | ug/l | J |
| 2706-90-3  | Perfluoropentanoic acid     | 0.0016 | 0.0038 | 0.0014  | ug/l | J |
| 307-24-4   | Perfluorohexanoic acid      | 0.0023 | 0.0038 | 0.00096 | ug/l | J |
| 375-85-9   | Perfluoroheptanoic acid     | ND     | 0.0038 | 0.00096 | ug/l |   |
| 335-67-1   | Perfluorooctanoic acid      | ND     | 0.0038 | 0.00096 | ug/l |   |
| 375-95-1   | Perfluorononanoic acid      | ND     | 0.0038 | 0.00096 | ug/l |   |
| 335-76-2   | Perfluorodecanoic acid      | ND     | 0.0038 | 0.00096 | ug/l |   |
| 2058-94-8  | Perfluoroundecanoic acid    | ND     | 0.0038 | 0.00096 | ug/l |   |
| 307-55-1   | Perfluorododecanoic acid    | ND     | 0.0038 | 0.0014  | ug/l |   |
| 72629-94-8 | Perfluorotridecanoic acid   | ND     | 0.0038 | 0.00096 | ug/l |   |
| 376-06-7   | Perfluorotetradecanoic acid | ND     | 0.0038 | 0.00096 | ug/l |   |

**PERFLUOROALKYL SULFONATES**

|            |                               |        |        |         |      |  |
|------------|-------------------------------|--------|--------|---------|------|--|
| 375-73-5   | Perfluorobutanesulfonic acid  | 0.0101 | 0.0038 | 0.00096 | ug/l |  |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND     | 0.0038 | 0.00096 | ug/l |  |
| 355-46-4   | Perfluorohexanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l |  |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND     | 0.0038 | 0.00096 | ug/l |  |
| 1763-23-1  | Perfluorooctanesulfonic acid  | ND     | 0.0038 | 0.0014  | ug/l |  |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l |  |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l |  |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |    |        |         |      |  |
|----------|-------|----|--------|---------|------|--|
| 754-91-6 | PFOSA | ND | 0.0038 | 0.00096 | ug/l |  |
|----------|-------|----|--------|---------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0077 | 0.0038 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0077 | 0.0038 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0077 | 0.0019 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0077 | 0.0019 | ug/l |  |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> MW-20-130_072320                   |                                |
| <b>Lab Sample ID:</b> FA77230-14                            | <b>Date Sampled:</b> 07/23/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0077 | 0.0019 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.019  | 0.0048 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0077 | 0.0019 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0077 | 0.0019 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0077 | 0.0019 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 78%    |        | 35-135% |
|         | 13C5-PFPeA             | 83%    |        | 50-150% |
|         | 13C5-PFHxA             | 82%    |        | 50-150% |
|         | 13C4-PFHpA             | 84%    |        | 50-150% |
|         | 13C8-PFOA              | 87%    |        | 50-150% |
|         | 13C9-PFNA              | 101%   |        | 50-150% |
|         | 13C6-PFDA              | 77%    |        | 50-150% |
|         | 13C7-PFUnDA            | 72%    |        | 40-140% |
|         | 13C2-PFDoDA            | 68%    |        | 40-140% |
|         | 13C2-PFTeDA            | 63%    |        | 30-130% |
|         | 13C3-PFBS              | 79%    |        | 50-150% |
|         | 13C3-PFHxS             | 79%    |        | 50-150% |
|         | 13C8-PFOS              | 78%    |        | 50-150% |
|         | 13C8-FOSA              | 83%    |        | 30-130% |
|         | d3-MeFOSAA             | 74%    |        | 50-150% |
|         | 13C2-4:2FTS            | 85%    |        | 50-150% |
|         | 13C2-6:2FTS            | 90%    |        | 50-150% |
|         | 13C2-8:2FTS            | 75%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 87%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P2-OP164_10-15                 |                                |
| <b>Lab Sample ID:</b> FA77230-15                            | <b>Date Sampled:</b> 07/24/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52454.D | 1  | 08/07/20 17:55 | NAF | 08/06/20 13:30 | OP81430    | S2Q780           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 260 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |        |        |         |      |  |
|------------|-----------------------------|--------|--------|---------|------|--|
| 375-22-4   | Perfluorobutanoic acid      | 0.0781 | 0.0077 | 0.0019  | ug/l |  |
| 2706-90-3  | Perfluoropentanoic acid     | 0.0294 | 0.0038 | 0.0014  | ug/l |  |
| 307-24-4   | Perfluorohexanoic acid      | 0.0228 | 0.0038 | 0.00096 | ug/l |  |
| 375-85-9   | Perfluoroheptanoic acid     | 0.0086 | 0.0038 | 0.00096 | ug/l |  |
| 335-67-1   | Perfluorooctanoic acid      | 0.0214 | 0.0038 | 0.00096 | ug/l |  |
| 375-95-1   | Perfluorononanoic acid      | ND     | 0.0038 | 0.00096 | ug/l |  |
| 335-76-2   | Perfluorodecanoic acid      | ND     | 0.0038 | 0.00096 | ug/l |  |
| 2058-94-8  | Perfluoroundecanoic acid    | ND     | 0.0038 | 0.00096 | ug/l |  |
| 307-55-1   | Perfluorododecanoic acid    | ND     | 0.0038 | 0.0014  | ug/l |  |
| 72629-94-8 | Perfluorotridecanoic acid   | ND     | 0.0038 | 0.00096 | ug/l |  |
| 376-06-7   | Perfluorotetradecanoic acid | ND     | 0.0038 | 0.00096 | ug/l |  |

**PERFLUOROALKYL SULFONATES**

|            |                               |        |        |         |      |   |
|------------|-------------------------------|--------|--------|---------|------|---|
| 375-73-5   | Perfluorobutanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l |   |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND     | 0.0038 | 0.00096 | ug/l |   |
| 355-46-4   | Perfluorohexanesulfonic acid  | 0.0063 | 0.0038 | 0.00096 | ug/l |   |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND     | 0.0038 | 0.00096 | ug/l |   |
| 1763-23-1  | Perfluorooctanesulfonic acid  | 0.0020 | 0.0038 | 0.0014  | ug/l | J |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l |   |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l |   |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |    |        |         |      |  |
|----------|-------|----|--------|---------|------|--|
| 754-91-6 | PFOSA | ND | 0.0038 | 0.00096 | ug/l |  |
|----------|-------|----|--------|---------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0077 | 0.0038 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0077 | 0.0038 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |        |        |        |      |   |
|-------------|-----------------------------|--------|--------|--------|------|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND     | 0.0077 | 0.0019 | ug/l |   |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | 0.0064 | 0.0077 | 0.0019 | ug/l | J |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P2-OP164_10-15                 |                                |
| <b>Lab Sample ID:</b> FA77230-15                            | <b>Date Sampled:</b> 07/24/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0077 | 0.0019 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 57%    |        | 35-135% |
|         | 13C5-PFPeA             | 63%    |        | 50-150% |
|         | 13C5-PFHxA             | 67%    |        | 50-150% |
|         | 13C4-PFHpA             | 69%    |        | 50-150% |
|         | 13C8-PFOA              | 79%    |        | 50-150% |
|         | 13C9-PFNA              | 81%    |        | 50-150% |
|         | 13C6-PFDA              | 80%    |        | 50-150% |
|         | 13C7-PFUnDA            | 78%    |        | 40-140% |
|         | 13C2-PFDoDA            | 77%    |        | 40-140% |
|         | 13C2-PFTeDA            | 72%    |        | 30-130% |
|         | 13C3-PFBS              | 73%    |        | 50-150% |
|         | 13C3-PFHxS             | 79%    |        | 50-150% |
|         | 13C8-PFOS              | 81%    |        | 50-150% |
|         | 13C8-FOSA              | 46%    |        | 30-130% |
|         | d3-MeFOSAA             | 70%    |        | 50-150% |
|         | 13C2-4:2FTS            | 69%    |        | 50-150% |
|         | 13C2-6:2FTS            | 81%    |        | 50-150% |
|         | 13C2-8:2FTS            | 80%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P2-OP164_27-32                 |                                |
| <b>Lab Sample ID:</b> FA77230-16                            | <b>Date Sampled:</b> 07/24/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF  | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|-----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52181.D | 1   | 08/03/20 20:56 | NAF | 07/31/20 10:30 | OP81355    | S2Q776           |
| Run #2 | 2Q52455.D | 1.2 | 08/07/20 18:10 | NAF | 08/06/20 13:30 | OP81430    | S2Q780           |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 260 ml         | 1.0 ml       |
| Run #2 | 270 ml         | 1.0 ml       |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                                     |        |        |         |      |   |
|------------|-------------------------------------|--------|--------|---------|------|---|
| 375-22-4   | Perfluorobutanoic acid <sup>a</sup> | 0.0289 | 0.0077 | 0.0019  | ug/l |   |
| 2706-90-3  | Perfluoropentanoic acid             | 0.0036 | 0.0038 | 0.0014  | ug/l | J |
| 307-24-4   | Perfluorohexanoic acid              | 0.0028 | 0.0038 | 0.00096 | ug/l | J |
| 375-85-9   | Perfluoroheptanoic acid             | 0.0019 | 0.0038 | 0.00096 | ug/l | J |
| 335-67-1   | Perfluorooctanoic acid              | 0.0089 | 0.0038 | 0.00096 | ug/l |   |
| 375-95-1   | Perfluorononanoic acid              | ND     | 0.0038 | 0.00096 | ug/l |   |
| 335-76-2   | Perfluorodecanoic acid              | ND     | 0.0038 | 0.00096 | ug/l |   |
| 2058-94-8  | Perfluoroundecanoic acid            | ND     | 0.0038 | 0.00096 | ug/l |   |
| 307-55-1   | Perfluorododecanoic acid            | ND     | 0.0038 | 0.0014  | ug/l |   |
| 72629-94-8 | Perfluorotridecanoic acid           | ND     | 0.0038 | 0.00096 | ug/l |   |
| 376-06-7   | Perfluorotetradecanoic acid         | ND     | 0.0038 | 0.00096 | ug/l |   |

**PERFLUOROALKYL SULFONATES**

|            |                               |                 |        |         |      |   |
|------------|-------------------------------|-----------------|--------|---------|------|---|
| 375-73-5   | Perfluorobutanesulfonic acid  | ND <sup>b</sup> | 0.0044 | 0.0011  | ug/l |   |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND <sup>b</sup> | 0.0044 | 0.0011  | ug/l |   |
| 355-46-4   | Perfluorohexanesulfonic acid  | 0.0017          | 0.0038 | 0.00096 | ug/l | J |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND              | 0.0038 | 0.00096 | ug/l |   |
| 1763-23-1  | Perfluorooctanesulfonic acid  | 0.0043          | 0.0038 | 0.0014  | ug/l |   |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND              | 0.0038 | 0.00096 | ug/l |   |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND              | 0.0038 | 0.00096 | ug/l |   |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |                 |        |        |      |  |
|----------|-------|-----------------|--------|--------|------|--|
| 754-91-6 | PFOSA | ND <sup>b</sup> | 0.0044 | 0.0011 | ug/l |  |
|----------|-------|-----------------|--------|--------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0077 | 0.0038 | ug/l |  |
| 2991-50-6 | EiFOSAA | ND | 0.0077 | 0.0038 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |        |        |        |      |   |
|-------------|-----------------------------|--------|--------|--------|------|---|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND     | 0.0077 | 0.0019 | ug/l |   |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | 0.0043 | 0.0077 | 0.0019 | ug/l | J |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|  |  |                         |
|--|--|-------------------------|
| Client Sample ID: VAP-P2-OP164_27-32                 |  | Date Sampled: 07/24/20  |
| Lab Sample ID: FA77230-16                            |  | Date Received: 07/28/20 |
| Matrix: AQ - Ground Water                            |  | Percent Solids: n/a     |
| Method: EPA 537M BY ID EPA 537 MOD                   |  |                         |
| Project: Racer Lansing PFAS Delineation; Lansing, MI |  |                         |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0077 | 0.0019 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.019  | 0.0048 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0077 | 0.0019 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0077 | 0.0019 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0077 | 0.0019 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1           | Run# 2           | Limits  |
|---------|------------------------|------------------|------------------|---------|
|         | 13C4-PFBA              | 18% <sup>d</sup> | 15% <sup>c</sup> | 35-135% |
|         | 13C5-PFPeA             | 72%              | 81%              | 50-150% |
|         | 13C5-PFHxA             | 61%              | 71%              | 50-150% |
|         | 13C4-PFHpA             | 72%              | 80%              | 50-150% |
|         | 13C8-PFOA              | 82%              | 92%              | 50-150% |
|         | 13C9-PFNA              | 91%              | 91%              | 50-150% |
|         | 13C6-PFDA              | 81%              | 95%              | 50-150% |
|         | 13C7-PFUnDA            | 76%              | 82%              | 40-140% |
|         | 13C2-PFDoDA            | 63%              | 60%              | 40-140% |
|         | 13C2-PFTeDA            | 50%              | 59%              | 30-130% |
|         | 13C3-PFBS              | 73%              | 85%              | 50-150% |
|         | 13C3-PFHxS             | 72%              | 92%              | 50-150% |
|         | 13C8-PFOS              | 73%              | 93%              | 50-150% |
|         | 13C8-FOSA              | 59%              | 54%              | 30-130% |
|         | d3-MeFOSAA             | 77%              | 95%              | 50-150% |
|         | 13C2-4:2FTS            | 83%              | 82%              | 50-150% |
|         | 13C2-6:2FTS            | 95%              | 99%              | 50-150% |
|         | 13C2-8:2FTS            | 93%              | 105%             | 50-150% |
|         | 13C3-HFPO-DA           | 76%              | 83%              | 50-150% |

- (a) Associated ID Standard outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.
- (b) Result is from Run# 2
- (c) Outside control limits.
- (d) Outside control limits due to matrix interference. Confirmed by re-extraction and reanalysis.

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|   |                              |  |
|---|------------------------------|--|
| ND = Not detected                             | MDL = Method Detection Limit | J = Indicates an estimated value                       |
| RL = Reporting Limit                          |                              | B = Indicates analyte found in associated method blank |
| E = Indicates value exceeds calibration range |                              | N = Indicates presumptive evidence of a compound       |

# Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> VAP-P2-PP185_19-24                 |                                |
| <b>Lab Sample ID:</b> FA77230-17                            | <b>Date Sampled:</b> 07/24/20  |
| <b>Matrix:</b> AQ - Ground Water                            | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| Run #  | File ID   | DF | Analyzed       | By  | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|-----|----------------|------------|------------------|
| Run #1 | 2Q52539.D | 1  | 08/09/20 18:57 | NAF | 08/07/20 08:30 | OP81449    | S2Q781           |
| Run #2 |           |    |                |     |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 260 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No.  | Compound                      | Result | RL     | MDL     | Units | Q |
|--|-------------------------------|--------|--------|---------|-------|---|
| <b>PERFLUOROALKYL CARBOXYLIC ACIDS</b>         |                               |        |        |         |       |   |
| 375-22-4                                       | Perfluorobutanoic acid        | 0.0041 | 0.0077 | 0.0019  | ug/l  | J |
| 2706-90-3                                      | Perfluoropentanoic acid       | ND     | 0.0038 | 0.0014  | ug/l  |   |
| 307-24-4                                       | Perfluorohexanoic acid        | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 375-85-9                                       | Perfluoroheptanoic acid       | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 335-67-1                                       | Perfluorooctanoic acid        | 0.0016 | 0.0038 | 0.00096 | ug/l  | J |
| 375-95-1                                       | Perfluorononanoic acid        | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 335-76-2                                       | Perfluorodecanoic acid        | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 2058-94-8                                      | Perfluoroundecanoic acid      | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 307-55-1                                       | Perfluorododecanoic acid      | ND     | 0.0038 | 0.0014  | ug/l  |   |
| 72629-94-8                                     | Perfluorotridecanoic acid     | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 376-06-7                                       | Perfluorotetradecanoic acid   | ND     | 0.0038 | 0.00096 | ug/l  |   |
| <b>PERFLUOROALKYL SULFONATES</b>               |                               |        |        |         |       |   |
| 375-73-5                                       | Perfluorobutanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 2706-91-4                                      | Perfluoropentanesulfonic acid | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 355-46-4                                       | Perfluorohexanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 375-92-8                                       | Perfluoroheptanesulfonic acid | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 1763-23-1                                      | Perfluorooctanesulfonic acid  | ND     | 0.0038 | 0.0014  | ug/l  |   |
| 68259-12-1                                     | Perfluorononanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l  |   |
| 335-77-3                                       | Perfluorodecanesulfonic acid  | ND     | 0.0038 | 0.00096 | ug/l  |   |
| <b>PERFLUORO OCTANESULFONAMIDES</b>            |                               |        |        |         |       |   |
| 754-91-6                                       | PFOSA                         | ND     | 0.0038 | 0.00096 | ug/l  |   |
| <b>PERFLUORO OCTANESULFONAMIDOACETIC ACIDS</b> |                               |        |        |         |       |   |
| 2355-31-9                                      | MeFOSAA                       | ND     | 0.0077 | 0.0038  | ug/l  |   |
| 2991-50-6                                      | EiFOSAA                       | ND     | 0.0077 | 0.0038  | ug/l  |   |
| <b>FLUOROTELOMER SULFONATES</b>                |                               |        |        |         |       |   |
| 757124-72-4                                    | 4:2 Fluorotelomer sulfonate   | ND     | 0.0077 | 0.0019  | ug/l  |   |
| 27619-97-2                                     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0077 | 0.0019  | ug/l  |   |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|  |  |                         |
|--|--|-------------------------|
| Client Sample ID: VAP-P2-PP185_19-24                 |  | Date Sampled: 07/24/20  |
| Lab Sample ID: FA77230-17                            |  | Date Received: 07/28/20 |
| Matrix: AQ - Ground Water                            |  | Percent Solids: n/a     |
| Method: EPA 537M BY ID EPA 537 MOD                   |  |                         |
| Project: Racer Lansing PFAS Delineation; Lansing, MI |  |                         |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0077 | 0.0019 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.019  | 0.0048 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0077 | 0.0019 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0077 | 0.0019 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0077 | 0.0019 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 87%    |        | 35-135% |
|         | 13C5-PFPeA             | 83%    |        | 50-150% |
|         | 13C5-PFHxA             | 86%    |        | 50-150% |
|         | 13C4-PFHpA             | 85%    |        | 50-150% |
|         | 13C8-PFOA              | 90%    |        | 50-150% |
|         | 13C9-PFNA              | 91%    |        | 50-150% |
|         | 13C6-PFDA              | 90%    |        | 50-150% |
|         | 13C7-PFUnDA            | 87%    |        | 40-140% |
|         | 13C2-PFDoDA            | 81%    |        | 40-140% |
|         | 13C2-PFTeDA            | 73%    |        | 30-130% |
|         | 13C3-PFBS              | 92%    |        | 50-150% |
|         | 13C3-PFHxS             | 102%   |        | 50-150% |
|         | 13C8-PFOS              | 95%    |        | 50-150% |
|         | 13C8-FOSA              | 91%    |        | 30-130% |
|         | d3-MeFOSAA             | 75%    |        | 50-150% |
|         | 13C2-4:2FTS            | 86%    |        | 50-150% |
|         | 13C2-6:2FTS            | 91%    |        | 50-150% |
|         | 13C2-8:2FTS            | 88%    |        | 50-150% |
|         | 13C3-HFPO-DA           | 91%    |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

# Report of Analysis

|   |  |                                |
|---|--|--------------------------------|
| <b>Client Sample ID:</b> FB_072420                          |  |                                |
| <b>Lab Sample ID:</b> FA77230-18                            |  | <b>Date Sampled:</b> 07/24/20  |
| <b>Matrix:</b> AQ - Field Blank Water                       |  | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   |  | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |  |                                |

| Run #  | File ID   | DF | Analyzed       | By | Prep Date      | Prep Batch | Analytical Batch |
|--------|-----------|----|----------------|----|----------------|------------|------------------|
| Run #1 | 3Q24683.D | 1  | 08/05/20 02:13 | NG | 08/01/20 12:30 | OP81352    | S3Q375           |
| Run #2 |           |    |                |    |                |            |                  |

| Run #  | Initial Volume | Final Volume |
|--------|----------------|--------------|
| Run #1 | 280 ml         | 1.0 ml       |
| Run #2 |                |              |

| CAS No. | Compound | Result | RL | MDL | Units | Q |
|---------|----------|--------|----|-----|-------|---|
|---------|----------|--------|----|-----|-------|---|

**PERFLUOROALKYL CARBOXYLIC ACIDS**

|            |                             |    |        |         |      |  |
|------------|-----------------------------|----|--------|---------|------|--|
| 375-22-4   | Perfluorobutanoic acid      | ND | 0.0071 | 0.0018  | ug/l |  |
| 2706-90-3  | Perfluoropentanoic acid     | ND | 0.0036 | 0.0013  | ug/l |  |
| 307-24-4   | Perfluorohexanoic acid      | ND | 0.0036 | 0.00089 | ug/l |  |
| 375-85-9   | Perfluoroheptanoic acid     | ND | 0.0036 | 0.00089 | ug/l |  |
| 335-67-1   | Perfluorooctanoic acid      | ND | 0.0036 | 0.00089 | ug/l |  |
| 375-95-1   | Perfluorononanoic acid      | ND | 0.0036 | 0.00089 | ug/l |  |
| 335-76-2   | Perfluorodecanoic acid      | ND | 0.0036 | 0.00089 | ug/l |  |
| 2058-94-8  | Perfluoroundecanoic acid    | ND | 0.0036 | 0.00089 | ug/l |  |
| 307-55-1   | Perfluorododecanoic acid    | ND | 0.0036 | 0.0013  | ug/l |  |
| 72629-94-8 | Perfluorotridecanoic acid   | ND | 0.0036 | 0.00089 | ug/l |  |
| 376-06-7   | Perfluorotetradecanoic acid | ND | 0.0036 | 0.00089 | ug/l |  |

**PERFLUOROALKYL SULFONATES**

|            |                               |    |        |         |      |  |
|------------|-------------------------------|----|--------|---------|------|--|
| 375-73-5   | Perfluorobutanesulfonic acid  | ND | 0.0036 | 0.00089 | ug/l |  |
| 2706-91-4  | Perfluoropentanesulfonic acid | ND | 0.0036 | 0.00089 | ug/l |  |
| 355-46-4   | Perfluorohexanesulfonic acid  | ND | 0.0036 | 0.00089 | ug/l |  |
| 375-92-8   | Perfluoroheptanesulfonic acid | ND | 0.0036 | 0.00089 | ug/l |  |
| 1763-23-1  | Perfluorooctanesulfonic acid  | ND | 0.0036 | 0.0013  | ug/l |  |
| 68259-12-1 | Perfluorononanesulfonic acid  | ND | 0.0036 | 0.00089 | ug/l |  |
| 335-77-3   | Perfluorodecanesulfonic acid  | ND | 0.0036 | 0.00089 | ug/l |  |

**PERFLUORO OCTANESULFONAMIDES**

|          |       |    |        |         |      |  |
|----------|-------|----|--------|---------|------|--|
| 754-91-6 | PFOSA | ND | 0.0036 | 0.00089 | ug/l |  |
|----------|-------|----|--------|---------|------|--|

**PERFLUORO OCTANESULFONAMIDOACETIC ACIDS**

|           |         |    |        |        |      |  |
|-----------|---------|----|--------|--------|------|--|
| 2355-31-9 | MeFOSAA | ND | 0.0071 | 0.0036 | ug/l |  |
| 2991-50-6 | EtFOSAA | ND | 0.0071 | 0.0036 | ug/l |  |

**FLUOROTELOMER SULFONATES**

|             |                             |    |        |        |      |  |
|-------------|-----------------------------|----|--------|--------|------|--|
| 757124-72-4 | 4:2 Fluorotelomer sulfonate | ND | 0.0071 | 0.0018 | ug/l |  |
| 27619-97-2  | 6:2 Fluorotelomer sulfonate | ND | 0.0071 | 0.0018 | ug/l |  |

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
 RL = Reporting Limit      B = Indicates analyte found in associated method blank  
 E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

## Report of Analysis

|   |                                |
|---|--------------------------------|
| <b>Client Sample ID:</b> FB_072420                          |                                |
| <b>Lab Sample ID:</b> FA77230-18                            | <b>Date Sampled:</b> 07/24/20  |
| <b>Matrix:</b> AQ - Field Blank Water                       | <b>Date Received:</b> 07/28/20 |
| <b>Method:</b> EPA 537M BY ID EPA 537 MOD                   | <b>Percent Solids:</b> n/a     |
| <b>Project:</b> Racer Lansing PFAS Delineation; Lansing, MI |                                |

| CAS No.    | Compound                    | Result | RL     | MDL    | Units | Q |
|------------|-----------------------------|--------|--------|--------|-------|---|
| 39108-34-4 | 8:2 Fluorotelomer sulfonate | ND     | 0.0071 | 0.0018 | ug/l  |   |

**NEXT GENERATION PFAS ANALYTES**

|             |                            |    |        |        |      |  |
|-------------|----------------------------|----|--------|--------|------|--|
| 13252-13-6  | HFPO-DA (GenX)             | ND | 0.018  | 0.0045 | ug/l |  |
| 919005-14-4 | ADONA                      | ND | 0.0071 | 0.0018 | ug/l |  |
| 756426-58-1 | 9Cl-PF3ONS (F-53B Major)   | ND | 0.0071 | 0.0018 | ug/l |  |
| 763051-92-9 | 11Cl-PF3OUdS (F-53B Minor) | ND | 0.0071 | 0.0018 | ug/l |  |

| CAS No. | ID Standard Recoveries | Run# 1 | Run# 2 | Limits  |
|---------|------------------------|--------|--------|---------|
|         | 13C4-PFBA              | 101%   |        | 35-135% |
|         | 13C5-PFPeA             | 100%   |        | 50-150% |
|         | 13C5-PFHxA             | 101%   |        | 50-150% |
|         | 13C4-PFHpA             | 103%   |        | 50-150% |
|         | 13C8-PFOA              | 102%   |        | 50-150% |
|         | 13C9-PFNA              | 102%   |        | 50-150% |
|         | 13C6-PFDA              | 107%   |        | 50-150% |
|         | 13C7-PFUnDA            | 103%   |        | 40-140% |
|         | 13C2-PFDoDA            | 92%    |        | 40-140% |
|         | 13C2-PFTeDA            | 87%    |        | 30-130% |
|         | 13C3-PFBS              | 102%   |        | 50-150% |
|         | 13C3-PFHxS             | 102%   |        | 50-150% |
|         | 13C8-PFOS              | 102%   |        | 50-150% |
|         | 13C8-FOSA              | 99%    |        | 30-130% |
|         | d3-MeFOSAA             | 93%    |        | 50-150% |
|         | 13C2-4:2FTS            | 96%    |        | 50-150% |
|         | 13C2-6:2FTS            | 102%   |        | 50-150% |
|         | 13C2-8:2FTS            | 102%   |        | 50-150% |
|         | 13C3-HFPO-DA           | 110%   |        | 50-150% |

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Misc. Forms

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### Custody Documents and Other Forms

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**Includes the following where applicable:**

- Certification Exceptions
- Chain of Custody

# Parameter Certification Exceptions

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.  
 The certification status of each is indicated below.

| Parameter                     | CAS#        | Method         | Mat | Certification Status   |
|-------------------------------|-------------|----------------|-----|------------------------|
| 4:2 Fluorotelomer sulfonate   | 757124-72-4 | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| 4:2 Fluorotelomer sulfonate   | 757124-72-4 | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| 6:2 Fluorotelomer sulfonate   | 27619-97-2  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| 6:2 Fluorotelomer sulfonate   | 27619-97-2  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| 8:2 Fluorotelomer sulfonate   | 39108-34-4  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| 8:2 Fluorotelomer sulfonate   | 39108-34-4  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| ADONA                         | 919005-14-4 | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| ADONA                         | 919005-14-4 | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| 11Cl-PF3OUdS (F-53B Minor)    | 763051-92-9 | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| 11Cl-PF3OUdS (F-53B Minor)    | 763051-92-9 | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| 9Cl-PF3ONS (F-53B Major)      | 756426-58-1 | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| 9Cl-PF3ONS (F-53B Major)      | 756426-58-1 | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| EtFOSAA                       | 2991-50-6   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| EtFOSAA                       | 2991-50-6   | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| HFPO-DA (GenX)                | 13252-13-6  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| HFPO-DA (GenX)                | 13252-13-6  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| MeFOSAA                       | 2355-31-9   | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| MeFOSAA                       | 2355-31-9   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| PFOSA                         | 754-91-6    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| PFOSA                         | 754-91-6    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorobutanesulfonic acid  | 375-73-5    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorobutanesulfonic acid  | 375-73-5    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorobutanoic acid        | 375-22-4    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorobutanoic acid        | 375-22-4    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorodecanesulfonic acid  | 335-77-3    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorodecanesulfonic acid  | 335-77-3    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorodecanoic acid        | 335-76-2    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorodecanoic acid        | 335-76-2    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorododecanoic acid      | 307-55-1    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorododecanoic acid      | 307-55-1    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluoroheptanesulfonic acid | 375-92-8    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluoroheptanesulfonic acid | 375-92-8    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoroheptanoic acid       | 375-85-9    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoroheptanoic acid       | 375-85-9    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorohexanesulfonic acid  | 355-46-4    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorohexanesulfonic acid  | 355-46-4    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorohexanoic acid        | 307-24-4    | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorohexanoic acid        | 307-24-4    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorononanesulfonic acid  | 68259-12-1  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorononanesulfonic acid  | 68259-12-1  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorononanoic acid        | 375-95-1    | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorononanoic acid        | 375-95-1    | EPA 537M BY ID | SO  | Certified by SOP MS014 |

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# Parameter Certification Exceptions

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

The following parameters included in this report are exceptions to NELAC certification.  
The certification status of each is indicated below.

| Parameter                     | CAS#       | Method         | Mat | Certification Status   |
|-------------------------------|------------|----------------|-----|------------------------|
| Perfluorooctanesulfonic acid  | 1763-23-1  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorooctanesulfonic acid  | 1763-23-1  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorooctanoic acid        | 335-67-1   | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorooctanoic acid        | 335-67-1   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoropentanesulfonic acid | 2706-91-4  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluoropentanesulfonic acid | 2706-91-4  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoropentanoic acid       | 2706-90-3  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoropentanoic acid       | 2706-90-3  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorotetradecanoic acid   | 376-06-7   | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorotetradecanoic acid   | 376-06-7   | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluorotridecanoic acid     | 72629-94-8 | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluorotridecanoic acid     | 72629-94-8 | EPA 537M BY ID | AQ  | Certified by SOP MS014 |
| Perfluoroundecanoic acid      | 2058-94-8  | EPA 537M BY ID | SO  | Certified by SOP MS014 |
| Perfluoroundecanoic acid      | 2058-94-8  | EPA 537M BY ID | AQ  | Certified by SOP MS014 |

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# FA77230

## SGS North America Inc - Orlando

### Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811  
TEL: 407-425-6700 FAX: 407-425-0707  
www.sgs.com

SGS - ORLANDO JOB #:

PAGE 1 OF 2

| Client / Reporting Information  |                                | Project Information  |   | Analytical Information  |   |                    |       |      |     |      |      |  |           | Matrix Codes        |      |   |
|---|--------------------------------|--|---|---|---|--------------------|-------|------|-----|------|------|--|-----------|---------------------|------|---|
| Company Name: <b>Arcadis</b>  |                                | Project Name: <b>MCLR Lansing PFAS delineation</b>   |   | <div style="writing-mode: vertical-rl; transform: rotate(180deg); font-size: small;">           PFA's via modified USEPA Method 537 with 150 fold dilution         </div> |   |                    |       |      |     |      |      |  |           | DW - Drinking Water |      |   |
| Address: <b>28550 Cabot Drive, Suite 500</b>  |                                | Street: <b>2800 W Saginaw Street</b>   |   |   |   |                    |       |      |     |      |      |  |           | GW - Ground Water   |      |   |
| City: <b>Novi</b> State: <b>MI</b> Zip: <b>48377</b>  |                                | City: <b>Lansing</b> State: <b>MI</b>  |   |   |   |                    |       |      |     |      |      |  |           | WW - Water          |      |   |
| Project Contact: <b>Alex Villhauer / Alex.Vilhauer@arcadis.com</b> Email:   |                                | Project # <b>30042872.03100</b>  |   |   |   |                    |       |      |     |      |      |  |           | SW - Surface Water  |      |   |
| Phone #: <b>616-180-3277</b>  |                                | Fax #: <b>313-994-2241</b>   |   |   |   |                    |       |      |     |      |      |  |           | SO - Soil           |      |   |
| Sampler(s) Name(s) (Printed): <b>Austin Westhuis Sampler 2: Kevin Donahue</b>   |                                | Client Purchase Order #  |   | SL - Sludge   |   |                    |       |      |     |      |      |  |           |                     |      |   |
|   |                                |  |   | OI - Oil  |   |                    |       |      |     |      |      |  |           |                     |      |   |
|   |                                |  |   | LIQ - Other Liquid  |   |                    |       |      |     |      |      |  |           |                     |      |   |
|   |                                |  |   | AIR - Air   |   |                    |       |      |     |      |      |  |           |                     |      |   |
|   |                                |  |   | SOL - Other Solid   |   |                    |       |      |     |      |      |  |           |                     |      |   |
|   |                                |  |   | LAB USE ONLY  |   |                    |       |      |     |      |      |  |           |                     |      |   |
| COLLECTION  |                                | CONTAINER INFORMATION  |   |   |   |                    |       |      |     |      |      |  |           |                     |      |   |
| SGS Orlando Sample #  | Field ID / Point of Collection | DATE   | TIME  | SAMPLED BY:   | MATRIX  | TOTAL # OF BOTTLES | OTHER | AGNE | HCl | NaOH | HNO3 | H2SO4  | NaOH/ZnAc | DI WATER            | MICH |   |
| 1   | SB-P2-0m185-0.6-1              | 7/17/20  | 1415  | AW  | S   | 1                  |       | X    |     |      |      |  |           |                     |      | X |
| 2   | SB-P2-0m185-9-9.5              | 7/17/20  | 1420  | AW  | S   | 1                  |       | X    |     |      |      |  |           |                     |      | X |
| 3   | SB-P2-0m185-19.5-20            | 7/17/20  | 1425  | AW  | S   | 1                  |       | X    |     |      |      |  |           |                     |      | X |
| 4   | SB-P2-0m185-31-31.5            | 7/17/20  | 1430  | AW  | S   | 1                  |       | X    |     |      |      |  |           |                     |      | X |
| 5   | SB-P2-0m185-41-41.5            | 7/17/20  | 1415  | AW  | S   | 1                  |       | X    |     |      |      |  |           |                     |      | X |
| 6   | SB-P2-0m185-52-52.5            | 7/17/20  | 1435  | AW  | S   | 1                  |       | X    |     |      |      |  |           |                     |      | X |
| 7   | SB-P2-0m185-59.5-60            | 7/17/20  | 1455  | AW  | S   | 1                  |       | X    |     |      |      |  |           |                     |      | X |
| 8   | VAP-P6-PG211-4-9               | 7/20/20  | 1543  | KD  | GW  | 2                  |       | X    |     |      |      |  |           |                     |      | X |
| 9   | DWP-01                         |  |   | KD  | GW  | 2                  |       | X    |     |      |      |  |           |                     |      | X |
| 10  | VAP-P2-NV170-6-11              | 7/23/20  | 0828  | KD  | GW  | 2                  |       | X    |     |      |      |  |           |                     |      | X |
| 11  | VAP-P2-NV170-18.5-23.5         | 7/23/20  | 0836  | KD  | GW  | 2                  |       | X    |     |      |      |  |           |                     |      | X |
| 12  | VAP-P6-OL211-1-6               | 7/23/20  | 1413  | KD  | GW  | 2                  |       | X    |     |      |      |  |           |                     |      | X |
| Turnaround Time (Business days)   |                                | Data Deliverable Information   |   |   |   |                    |       |      |     |      |      | Comments / Remarks   |           |                     |      |   |
| <input checked="" type="checkbox"/> 10 Day (Business) Approved By: / Date: _____<br><input type="checkbox"/> 7 Day<br><input type="checkbox"/> 5 Day<br><input type="checkbox"/> 3 Day RUSH<br><input type="checkbox"/> 2 Day RUSH<br><input type="checkbox"/> 1 Day RUSH<br><input type="checkbox"/> Other |                                | <input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY)<br><input type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC)<br><input type="checkbox"/> REDT1 (EPA LEVEL 3)<br><input type="checkbox"/> FULLT1 (EPA LEVEL 4)<br><input type="checkbox"/> EDD'S |   |   |   |                    |       |      |     |      |      | * Please analyze for the 28 PFAS outlined in the Michigan Department of Environment, Great Lakes, and Energy (EGLE) PFAS Minimum Laboratory Analyte List (EGLE2019) using modified USEPA Method 537 with 150 fold dilution |           |                     |      |   |
| Rush T/A Data Available VIA Email or Lablink  |                                | Sample Custody must be documented below each time samples change possession, including courier delivery.   |   |   |   |                    |       |      |     |      |      |  |           |                     |      |   |
| Relinquished by Sampler/Affiliation<br><i>Kevin Donahue/Arcadis</i>   | Date Time:<br>7/21/20 1745     | Received By/Affiliation<br>2 FedEx   | Relinquished By/Affiliation<br>3 <i>[Signature]</i> | Date Time:<br>7.45  | Received By/Affiliation<br>4 <i>[Signature]</i> |                    |       |      |     |      |      |  |           |                     |      |   |
| Relinquished by Affiliation<br>5  | Date Time:                     | Received By/Affiliation<br>6   | Relinquished By/Affiliation<br>7                    | Date Time:  | Received By/Affiliation<br>8                    |                    |       |      |     |      |      |  |           |                     |      |   |
| Lab Use Only: Cooler Temperature (s) Celsius (corrected): <i>10</i>   |                                | http://www.sgs.com/en/terms-and-conditions   |   |   |   |                    |       |      |     |      |      |  |           |                     |      |   |

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FA77230

SGS North America Inc - Orlando

Chain of Custody

4405 Vineland Road, Suite C-15 Orlando, FL 32811  
TEL: 407-425-6700 FAX: 407-425-0707  
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SGS - ORLANDO JOB #:

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SGS - ORLANDO Quote # SKIFF #

| Client / Reporting Information   |                                |              | Project Information  |            |            | Analytical Information   |       |            |                         |      |            |                             |       |            |                         | Matrix Codes        |  |
|--|--------------------------------|--------------|--|------------|------------|--|-------|------------|-------------------------|------|------------|-----------------------------|-------|------------|-------------------------|---------------------|--|
| Company Name: Arcadis  |                                |              | Project Name: RALER Lansing PFAS Delineation   |            |            |  |       |            |                         |      |            |                             |       |            |                         | DW - Drinking Water |  |
| Address: 28550 Cabot Dr, Suite 500   |                                |              | Street: 2800 W Saginaw St.   |            |            |  |       |            |                         |      |            |                             |       |            |                         | GW - Ground Water   |  |
| City: Novi State: MI Zip: 48377  |                                |              | City: Lansing State: MI  |            |            |  |       |            |                         |      |            |                             |       |            |                         | WW - Water          |  |
| Project Contact: Alex Villhauer Email: Alex.Vilhauer@arcadis.com   |                                |              | Project #: 30042872.03100  |            |            |  |       |            |                         |      |            |                             |       |            |                         | SW - Surface Water  |  |
| Phone #: 616-780-3277  |                                |              | Fax #: 248-944-2241  |            |            |  |       |            |                         |      |            |                             |       |            |                         | SO - Soil           |  |
| Sampler(s) Name(s) (Printed)   |                                |              | Client Purchase Order #  |            |            |  |       |            |                         |      |            |                             |       |            |                         | SL - Sludge         |  |
| Sampler 1: Kara Donahue  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         | LIQ - Other Liquid  |  |
| Sampler 2: Anyssa Mandich  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         | OI - Oil            |  |
|  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         | AIR - Air           |  |
|  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         | SOL - Other Solid   |  |
|  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         | LAB USE ONLY        |  |
| COLLECTION   |                                |              | CONTAINER INFORMATION  |            |            |  |       |            |                         |      |            |                             |       |            |                         |                     |  |
| SGS Orlando Sample #   | Field ID / Point of Collection | DATE         | TIME   | SAMPLED BY | MATRIX     | TOTAL # OF BOTTLES   | OTHER | PHONE      | HCl                     | NO3N | NO3N       | PHOS                        | PHOS4 | NH4NH2     | DIWATER                 | MESH                |  |
| 13   | VAP-P2-06211-33-38             | 7/23/20      | 1445   | KD         | GW         | 2  |       | X          |                         |      |            |                             |       |            |                         |                     |  |
| 14   | MW-20-130-072320               | 7/23/20      | 1750   | AM         | GW         | 2  |       | X          |                         |      |            |                             |       |            |                         |                     |  |
| 15   | VAP-P2-09164-10-15             | 7/24/20      | 1353   | KD         | GW         | 2  |       | X          |                         |      |            |                             |       |            |                         |                     |  |
| 16   | VAP-P2-09164-07-32             | 7/24/20      | 1410   | KD         | GW         | 2  |       | X          |                         |      |            |                             |       |            |                         |                     |  |
| 17   | VAP-P2-PP185-19-24             | 7/24/20      | 1445   | KD         | GW         | 2  |       | X          |                         |      |            |                             |       |            |                         |                     |  |
|  | KD Trip Blank                  | 7/24/20      |  |            |            |  |       |            |                         |      |            |                             |       |            |                         |                     |  |
| 18   | FB-072420                      | 7/24/20      | 1610   | KD         | WW         | 2  |       | X          |                         |      |            |                             |       |            |                         |                     |  |
|  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         | APR APPROVAL        |  |
|  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         | APR VERIFICATION    |  |
| Turnaround Time (Business days)  |                                |              | Data Deliverable Information   |            |            | Comments / Remarks   |       |            |                         |      |            |                             |       |            |                         |                     |  |
| <input checked="" type="checkbox"/> 10 Day (Business)<br><input type="checkbox"/> 7 Day<br><input type="checkbox"/> 5 Day<br><input type="checkbox"/> 3 Day RUSH<br><input type="checkbox"/> 2 Day RUSH<br><input type="checkbox"/> 1 Day RUSH<br><input type="checkbox"/> Other |                                |              | Approved By: / Date:   |            |            | <input type="checkbox"/> COMMERCIAL "A" (RESULTS ONLY)<br><input type="checkbox"/> COMMERCIAL "B" (RESULTS PLUS QC)<br><input type="checkbox"/> REDT1 (EPA LEVEL 3)<br><input type="checkbox"/> FULLT1 (EPA LEVEL 4)<br><input type="checkbox"/> EDD'S |       |            |                         |      |            |                             |       |            |                         |                     |  |
|  |                                |              |  |            |            | * PLEASE ANALYZE FOR THE 28 PFAS outlined in the Michigan Dept. of Environment Great Lakes, and Energy (EGLE) PFAS minimum Laboratory Analyte List (EGLE 2019) using modified USEPA Method 537 with isotope dilution                                   |       |            |                         |      |            |                             |       |            |                         |                     |  |
| Rush T/A Data Available VIA Email or Lablink   |                                |              | Sample Custody must be documented below each time samples change possession, including courier delivery. |            |            |  |       |            |                         |      |            |                             |       |            |                         |                     |  |
| Relinquished by Sampler/Affiliation  |                                | Date Time:   | Received By/Affiliation  |            | Date Time: | Relinquished By/Affiliation  |       | Date Time: | Received By/Affiliation |      | Date Time: | Relinquished By/Affiliation |       | Date Time: | Received By/Affiliation |                     |  |
| Kara Donahue / Arcadis   |                                | 7/24/20 1445 | 2 FEDEX  |            |            | 3  |       |            | 4 07/28/20              |      | 5          |                             | 6     |            | 7                       |                     |  |
| Relinquished by/Affiliation  |                                | Date Time:   | Received By/Affiliation  |            | Date Time: | Relinquished By/Affiliation  |       | Date Time: | Received By/Affiliation |      | Date Time: | Relinquished By/Affiliation |       | Date Time: | Received By/Affiliation |                     |  |
|  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         |                     |  |
| Lab Use Only: Cooler Temperature (s) Celsius (corrected): 1.0  |                                |              |  |            |            |  |       |            |                         |      |            |                             |       |            |                         |                     |  |

ORLD-SMT-0001-03-FORM-COC (4).xls Rev 031318

FA77230: Chain of Custody

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## SGS Sample Receipt Summary

Job Number: FA77230

Client: ARCADIS

Project: RACER LANSING PFAS DELINEATION

Date / Time Received: 7/28/2020 9:45:00 AM

Delivery Method: FEDEX

Airbill #s: 1002284323770003281100138666005237

Therm ID: IR 1;

Therm CF: -0.2;

# of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (0.8);

Cooler Temps (Corrected) °C: Cooler 1: (0.6);

**Cooler Information**

|                             | <u>Y</u>                            | <u>or</u> | <u>N</u>                 |
|-----------------------------|-------------------------------------|-----------|--------------------------|
| 1. Custody Seals Present    | <input checked="" type="checkbox"/> |           | <input type="checkbox"/> |
| 2. Custody Seals Intact     | <input checked="" type="checkbox"/> |           | <input type="checkbox"/> |
| 3. Temp criteria achieved   | <input checked="" type="checkbox"/> |           | <input type="checkbox"/> |
| 4. Cooler temp verification | <u>IR Gun</u>                       |           |                          |
| 5. Cooler media             | <u>Ice (Bag)</u>                    |           |                          |

**Trip Blank Information**

|                                | <u>Y</u>                 | <u>or</u> | <u>N</u>                 | <u>N/A</u>                          |
|--------------------------------|--------------------------|-----------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler | <input type="checkbox"/> |           | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Trip Blank listed on COC    | <input type="checkbox"/> |           | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|                                | <u>W</u>                 | <u>or</u> | <u>S</u>                 | <u>N/A</u>                          |
| 3. Type Of TB Received         | <input type="checkbox"/> |           | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

**Sample Information**

|   | <u>Y</u>                            | <u>or</u> | <u>N</u>                            | <u>N/A</u>                          |
|---|-------------------------------------|-----------|-------------------------------------|-------------------------------------|
| 1. Sample labels present on bottles                 | <input checked="" type="checkbox"/> |           | <input type="checkbox"/>            |                                     |
| 2. Samples preserved properly                       | <input checked="" type="checkbox"/> |           | <input type="checkbox"/>            |                                     |
| 3. Sufficient volume/containers recvd for analysis: | <input checked="" type="checkbox"/> |           | <input type="checkbox"/>            |                                     |
| 4. Condition of sample                              | <u>Intact</u>                       |           |                                     |                                     |
| 5. Sample recvd within HT                           | <input checked="" type="checkbox"/> |           | <input type="checkbox"/>            |                                     |
| 6. Dates/Times/IDs on COC match Sample Label        | <input checked="" type="checkbox"/> |           | <input type="checkbox"/>            |                                     |
| 7. VOCs have headspace                              | <input type="checkbox"/>            |           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8. Bottles received for unspecified tests           | <input type="checkbox"/>            |           | <input checked="" type="checkbox"/> |                                     |
| 9. Compositing instructions clear                   | <input type="checkbox"/>            |           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10. Voa Soil Kits/Jars received past 48hrs?         | <input type="checkbox"/>            |           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11. % Solids Jar received?                          | <input type="checkbox"/>            |           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 12. Residual Chlorine Present?                      | <input type="checkbox"/>            |           | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Misc. Information**

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_ Number of 5035 Field Kits: \_\_\_\_\_ Number of Lab Filtered Metals: \_\_\_\_\_  
 Test Strip Lot #: pH 0-3 230315 pH 10-12 219813A Other: (Specify) \_\_\_\_\_  
 Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Comments

SM001  
Rev. Date 05/24/17

Technician: AKARIG

Date: 7/28/2020 9:45:00 AM

Reviewer: \_\_\_\_\_

Date: \_\_\_\_\_

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4.2  
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## MS Semi-volatiles

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### QC Data Summaries

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**Includes the following where applicable:**

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

# Method Blank Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |     |           |            |                  |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| OP81355-MB | 2Q52155.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No.         | Compound                      | Result | RL     | MDL    | Units | Q |
|-----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4        | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3       | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4        | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9        | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1        | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1        | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2        | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8       | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1        | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8      | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7        | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5        | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4       | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4        | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8        | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1       | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1      | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3        | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6        | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9       | MeFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 2991-50-6       | EiFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 757124-72-44:2  | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2      | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4      | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 13252-13-6      | HFPO-DA (GenX)                | ND     | 0.020  | 0.0050 | ug/l  |   |
| 919005-14-4     | ADONA                         | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 756426-58-19Cl  | PF3ONS (F-53B Major)          | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 763051-92-911Cl | PF3OUdS (F-53B Minor)         | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C4-PFBA              | 85% 35-135% |
|         | 13C5-PFPeA             | 85% 50-150% |
|         | 13C5-PFHxA             | 84% 50-150% |
|         | 13C4-PFHpA             | 85% 50-150% |

5.1.1  
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## Method Blank Summary

**Job Number:** FA77230  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81355-MB | 2Q52155.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C8-PFOA              | 85% 50-150% |
|         | 13C9-PFNA              | 95% 50-150% |
|         | 13C6-PFDA              | 80% 50-150% |
|         | 13C7-PFUnDA            | 76% 40-140% |
|         | 13C2-PFDoDA            | 70% 40-140% |
|         | 13C2-PFTeDA            | 70% 30-130% |
|         | 13C3-PFBS              | 83% 50-150% |
|         | 13C3-PFHxS             | 82% 50-150% |
|         | 13C8-PFOS              | 78% 50-150% |
|         | 13C8-FOSA              | 82% 30-130% |
|         | d3-MeFOSAA             | 77% 50-150% |
|         | 13C2-4:2FTS            | 80% 50-150% |
|         | 13C2-6:2FTS            | 81% 50-150% |
|         | 13C2-8:2FTS            | 76% 50-150% |
|         | 13C3-HFPO-DA           | 94% 50-150% |

5.1.1  
5

# Method Blank Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |    |           |            |                  |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
| OP81352-MB | 3Q24681.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 13252-13-6     | HFPO-DA (GenX)                | ND     | 0.020  | 0.0050 | ug/l  |   |
| 919005-14-4    | ADONA                         | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C4-PFBA              | 82% 35-135% |
|         | 13C5-PFPeA             | 80% 50-150% |
|         | 13C5-PFHxA             | 81% 50-150% |
|         | 13C4-PFHpA             | 82% 50-150% |

## Method Blank Summary

**Job Number:** FA77230  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP81352-MB | 3Q24681.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C8-PFOA              | 82% 50-150% |
|         | 13C9-PFNA              | 81% 50-150% |
|         | 13C6-PFDA              | 81% 50-150% |
|         | 13C7-PFUnDA            | 77% 40-140% |
|         | 13C2-PFDoDA            | 70% 40-140% |
|         | 13C2-PFTeDA            | 70% 30-130% |
|         | 13C3-PFBS              | 81% 50-150% |
|         | 13C3-PFHxS             | 82% 50-150% |
|         | 13C8-PFOS              | 79% 50-150% |
|         | 13C8-FOSA              | 86% 30-130% |
|         | d3-MeFOSAA             | 76% 50-150% |
|         | 13C2-4:2FTS            | 77% 50-150% |
|         | 13C2-6:2FTS            | 80% 50-150% |
|         | 13C2-8:2FTS            | 77% 50-150% |
|         | 13C3-HFPO-DA           | 89% 50-150% |

# Method Blank Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81430-MB | 2Q52453.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C4-PFBA              | 108% 35-135% |
|         | 13C5-PFPeA             | 102% 50-150% |
|         | 13C5-PFHxA             | 103% 50-150% |
|         | 13C4-PFHpA             | 105% 50-150% |
|         | 13C8-PFOA              | 107% 50-150% |
|         | 13C9-PFNA              | 107% 50-150% |
|         | 13C6-PFDA              | 106% 50-150% |
|         | 13C7-PFUnDA            | 104% 40-140% |

5.1.3  
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# Method Blank Summary

**Job Number:** FA77230  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81430-MB | 2Q52453.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C2-PFDoDA            | 98% 40-140%  |
|         | 13C2-PFTeDA            | 89% 30-130%  |
|         | 13C3-PFBS              | 106% 50-150% |
|         | 13C3-PFHxS             | 111% 50-150% |
|         | 13C8-PFOS              | 107% 50-150% |
|         | 13C8-FOSA              | 105% 30-130% |
|         | d3-MeFOSAA             | 90% 50-150%  |
|         | 13C2-4:2FTS            | 95% 50-150%  |
|         | 13C2-6:2FTS            | 100% 50-150% |
|         | 13C2-8:2FTS            | 103% 50-150% |

5.1.3  
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# Method Blank Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |     |           |            |                  |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| OP81449-MB | 2Q52538.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.0080 | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 13252-13-6     | HFPO-DA (GenX)                | ND     | 0.020  | 0.0050 | ug/l  |   |
| 919005-14-4    | ADONA                         | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C4-PFBA              | 82% 35-135% |
|         | 13C5-PFPeA             | 80% 50-150% |
|         | 13C5-PFHxA             | 79% 50-150% |
|         | 13C4-PFHpA             | 80% 50-150% |

5.1.4  
5

## Method Blank Summary

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81449-MB | 2Q52538.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C8-PFOA              | 83% 50-150% |
|         | 13C9-PFNA              | 80% 50-150% |
|         | 13C6-PFDA              | 79% 50-150% |
|         | 13C7-PFUnDA            | 74% 40-140% |
|         | 13C2-PFDoDA            | 68% 40-140% |
|         | 13C2-PFTeDA            | 64% 30-130% |
|         | 13C3-PFBS              | 85% 50-150% |
|         | 13C3-PFHxS             | 94% 50-150% |
|         | 13C8-PFOS              | 86% 50-150% |
|         | 13C8-FOSA              | 89% 30-130% |
|         | d3-MeFOSAA             | 62% 50-150% |
|         | 13C2-4:2FTS            | 76% 50-150% |
|         | 13C2-6:2FTS            | 78% 50-150% |
|         | 13C2-8:2FTS            | 74% 50-150% |
|         | 13C3-HFPO-DA           | 88% 50-150% |

# Method Blank Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| OP81492-MB | 4Q4439.D | 1  | 08/11/20 | NAF | 08/10/20  | OP81492    | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No.        | Compound                      | Result | RL   | MDL  | Units | Q |
|----------------|-------------------------------|--------|------|------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 1.0  | 0.38 | ug/kg |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.50 | 0.25 | ug/kg |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.50 | 0.25 | ug/kg |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.50 | 0.25 | ug/kg |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.50 | 0.25 | ug/kg |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.50 | 0.25 | ug/kg |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.50 | 0.25 | ug/kg |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.50 | 0.25 | ug/kg |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.50 | 0.25 | ug/kg |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.50 | 0.27 | ug/kg |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.50 | 0.25 | ug/kg |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.50 | 0.25 | ug/kg |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.50 | 0.25 | ug/kg |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.50 | 0.25 | ug/kg |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.50 | 0.25 | ug/kg |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.50 | 0.25 | ug/kg |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.50 | 0.25 | ug/kg |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.50 | 0.25 | ug/kg |   |
| 754-91-6       | PFOSA                         | ND     | 0.50 | 0.25 | ug/kg |   |
| 2355-31-9      | MeFOSAA                       | ND     | 1.0  | 0.50 | ug/kg |   |
| 2991-50-6      | EiFOSAA                       | ND     | 1.0  | 0.50 | ug/kg |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 1.0  | 0.25 | ug/kg |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 1.0  | 0.25 | ug/kg |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 1.0  | 0.25 | ug/kg |   |
| 13252-13-6     | HFPO-DA (GenX)                | ND     | 2.5  | 0.50 | ug/kg |   |
| 919005-14-4    | ADONA                         | ND     | 0.50 | 0.25 | ug/kg |   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND     | 0.50 | 0.29 | ug/kg |   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND     | 0.50 | 0.26 | ug/kg |   |

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C4-PFBA              | 75% 40-140% |
|         | 13C5-PFPeA             | 83% 50-150% |
|         | 13C5-PFHxA             | 86% 50-150% |
|         | 13C4-PFHpA             | 86% 50-150% |

5.1.5  
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## Method Blank Summary

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| OP81492-MB | 4Q4439.D | 1  | 08/11/20 | NAF | 08/10/20  | OP81492    | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C8-PFOA              | 88% 50-150% |
|         | 13C9-PFNA              | 87% 50-150% |
|         | 13C6-PFDA              | 86% 50-150% |
|         | 13C7-PFUnDA            | 82% 40-140% |
|         | 13C2-PFDoDA            | 81% 40-140% |
|         | 13C2-PFTeDA            | 82% 30-130% |
|         | 13C3-PFBS              | 85% 50-150% |
|         | 13C3-PFHxS             | 86% 50-150% |
|         | 13C8-PFOS              | 85% 50-150% |
|         | 13C8-FOSA              | 94% 30-130% |
|         | d3-MeFOSAA             | 84% 50-150% |
|         | 13C2-4:2FTS            | 82% 50-150% |
|         | 13C2-6:2FTS            | 85% 50-150% |
|         | 13C2-8:2FTS            | 80% 50-150% |
|         | 13C3-HFPO-DA           | 79% 50-150% |

# Instrument Blank

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|             |           |    |          |     |           |            |                  |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| S2Q776-IBLK | 2Q52149.D | 1  | 08/03/20 | NAF | n/a       | n/a        | S2Q776           |

The QC reported here applies to the following samples: Method: EPA 537M QSM5.3 B-15

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 13252-13-6     | HFPO-DA (GenX)                | ND     | 0.020  | 0.0050 | ug/l  |   |
| 919005-14-4    | ADONA                         | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C4-PFBA              | 105% 50-150% |
|         | 13C5-PFPeA             | 106% 50-150% |
|         | 13C5-PFHxA             | 104% 50-150% |
|         | 13C4-PFHpA             | 104% 50-150% |

5.1.6  
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# Instrument Blank

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| S2Q776-IBLK | 2Q52149.D | 1  | 08/03/20 | NAF | n/a       | n/a        | S2Q776           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C8-PFOA              | 105% 50-150% |
|         | 13C9-PFNA              | 120% 50-150% |
|         | 13C6-PFDA              | 100% 50-150% |
|         | 13C7-PFUnDA            | 109% 50-150% |
|         | 13C2-PFDoDA            | 107% 50-150% |
|         | 13C2-PFTeDA            | 104% 50-150% |
|         | 13C3-PFBS              | 103% 50-150% |
|         | 13C3-PFHxS             | 101% 50-150% |
|         | 13C8-PFOS              | 101% 50-150% |
|         | 13C8-FOSA              | 109% 50-150% |
|         | d3-MeFOSAA             | 103% 50-150% |
|         | 13C2-4:2FTS            | 97% 50-150%  |
|         | 13C2-6:2FTS            | 100% 50-150% |
|         | 13C2-8:2FTS            | 96% 50-150%  |

5.1.6  
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# Instrument Blank

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|             |           |    |          |     |           |            |                  |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| S2Q777-IBLK | 2Q52236.D | 1  | 08/04/20 | NAF | n/a       | n/a        | S2Q777           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-11

| CAS No.  | Compound | Result | RL     | MDL    | Units | Q |
|----------|----------|--------|--------|--------|-------|---|
| 754-91-6 | PFOSA    | ND     | 0.0040 | 0.0010 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C4-PFBA              | 95% 50-150%  |
|         | 13C5-PFPeA             | 94% 50-150%  |
|         | 13C5-PFHxA             | 93% 50-150%  |
|         | 13C4-PFHpA             | 98% 50-150%  |
|         | 13C8-PFOA              | 97% 50-150%  |
|         | 13C9-PFNA              | 99% 50-150%  |
|         | 13C6-PFDA              | 95% 50-150%  |
|         | 13C7-PFUnDA            | 95% 50-150%  |
|         | 13C2-PFDoDA            | 95% 50-150%  |
|         | 13C2-PFTeDA            | 97% 50-150%  |
|         | 13C3-PFBS              | 93% 50-150%  |
|         | 13C3-PFHxS             | 100% 50-150% |
|         | 13C8-PFOS              | 95% 50-150%  |
|         | 13C8-FOSA              | 99% 50-150%  |
|         | d3-MeFOSAA             | 96% 50-150%  |
|         | 13C2-4:2FTS            | 86% 50-150%  |
|         | 13C2-6:2FTS            | 92% 50-150%  |
|         | 13C2-8:2FTS            | 91% 50-150%  |

5.1.7  
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Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|             |           |    |          |    |           |            |                  |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
| S3Q375-IBLK | 3Q24647.D | 1  | 08/04/20 | NG | n/a       | n/a        | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-18

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 13252-13-6     | HFPO-DA (GenX)                | ND     | 0.020  | 0.0050 | ug/l  |   |
| 919005-14-4    | ADONA                         | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C4-PFBA              | 106% 50-150% |
|         | 13C5-PFPeA             | 105% 50-150% |
|         | 13C5-PFHxA             | 106% 50-150% |
|         | 13C4-PFHpA             | 107% 50-150% |

5.1.8  
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# Instrument Blank

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| S3Q375-IBLK | 3Q24647.D | 1  | 08/04/20 | NG | n/a       | n/a        | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-18

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C8-PFOA              | 109% 50-150% |
|         | 13C9-PFNA              | 109% 50-150% |
|         | 13C6-PFDA              | 110% 50-150% |
|         | 13C7-PFUnDA            | 108% 50-150% |
|         | 13C2-PFDoDA            | 110% 50-150% |
|         | 13C2-PFTeDA            | 107% 50-150% |
|         | 13C3-PFBS              | 105% 50-150% |
|         | 13C3-PFHxS             | 106% 50-150% |
|         | 13C8-PFOS              | 109% 50-150% |
|         | 13C8-FOSA              | 113% 50-150% |
|         | d3-MeFOSAA             | 109% 50-150% |
|         | 13C2-4:2FTS            | 100% 50-150% |
|         | 13C2-6:2FTS            | 104% 50-150% |
|         | 13C2-8:2FTS            | 102% 50-150% |
|         | 13C3-HFPO-DA           | 103% 50-150% |

5.1.8  
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# Instrument Blank

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|             |           |    |          |     |           |            |                  |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| S2Q780-IBLK | 2Q52449.D | 1  | 08/07/20 | NAF | n/a       | n/a        | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-15

| CAS No.        | Compound                      | Result | RL   | MDL  | Units | Q |
|----------------|-------------------------------|--------|------|------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 1.0  | 0.25 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.50 | 0.19 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.50 | 0.13 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.50 | 0.13 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.50 | 0.13 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.50 | 0.13 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.50 | 0.13 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.50 | 0.13 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.50 | 0.19 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.50 | 0.13 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.50 | 0.13 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.50 | 0.13 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.50 | 0.13 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.50 | 0.13 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.50 | 0.13 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.50 | 0.19 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.50 | 0.13 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.50 | 0.13 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.50 | 0.13 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 2.5  | 0.50 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 2.5  | 0.50 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 1.0  | 0.25 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 1.0  | 0.25 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 1.0  | 0.25 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C4-PFBA              | 97% 50-150%  |
|         | 13C5-PFPeA             | 96% 50-150%  |
|         | 13C5-PFHxA             | 99% 50-150%  |
|         | 13C4-PFHpA             | 98% 50-150%  |
|         | 13C8-PFOA              | 99% 50-150%  |
|         | 13C9-PFNA              | 100% 50-150% |
|         | 13C6-PFDA              | 100% 50-150% |
|         | 13C7-PFUnDA            | 99% 50-150%  |

5.1.9  
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# Instrument Blank

**Job Number:** FA77230  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| S2Q780-IBLK | 2Q52449.D | 1  | 08/07/20 | NAF | n/a       | n/a        | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-15

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C2-PFDoDA            | 99% 50-150%  |
|         | 13C2-PFTeDA            | 100% 50-150% |
|         | 13C3-PFBS              | 94% 50-150%  |
|         | 13C3-PFHxS             | 104% 50-150% |
|         | 13C8-PFOS              | 103% 50-150% |
|         | 13C8-FOSA              | 101% 50-150% |
|         | d3-MeFOSAA             | 85% 50-150%  |
|         | 13C2-4:2FTS            | 92% 50-150%  |
|         | 13C2-6:2FTS            | 93% 50-150%  |
|         | 13C2-8:2FTS            | 95% 50-150%  |

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Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|             |           |    |          |     |           |            |                  |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| S2Q781-IBLK | 2Q52502.D | 1  | 08/09/20 | NAF | n/a       | n/a        | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-17

| CAS No.        | Compound                      | Result | RL     | MDL    | Units | Q |
|----------------|-------------------------------|--------|--------|--------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 0.0040 | 0.0015 | ug/l  |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 754-91-6       | PFOSA                         | ND     | 0.0040 | 0.0010 | ug/l  |   |
| 2355-31-9      | MeFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 2991-50-6      | EiFOSAA                       | ND     | 0.020  | 0.0040 | ug/l  |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 13252-13-6     | HFPO-DA (GenX)                | ND     | 0.020  | 0.0050 | ug/l  |   |
| 919005-14-4    | ADONA                         | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND     | 0.0080 | 0.0020 | ug/l  |   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND     | 0.0080 | 0.0020 | ug/l  |   |

| CAS No. | ID Standard Recoveries | Limits      |
|---------|------------------------|-------------|
|         | 13C4-PFBA              | 89% 50-150% |
|         | 13C5-PFPeA             | 83% 50-150% |
|         | 13C5-PFHxA             | 82% 50-150% |
|         | 13C4-PFHpA             | 88% 50-150% |

5.1.10  
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# Instrument Blank

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| S2Q781-IBLK | 2Q52502.D | 1  | 08/09/20 | NAF | n/a       | n/a        | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-17

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C8-PFOA              | 87% 50-150%  |
|         | 13C9-PFNA              | 83% 50-150%  |
|         | 13C6-PFDA              | 89% 50-150%  |
|         | 13C7-PFUnDA            | 95% 50-150%  |
|         | 13C2-PFDoDA            | 94% 50-150%  |
|         | 13C2-PFTeDA            | 85% 50-150%  |
|         | 13C3-PFBS              | 92% 50-150%  |
|         | 13C3-PFHxS             | 105% 50-150% |
|         | 13C8-PFOS              | 95% 50-150%  |
|         | 13C8-FOSA              | 97% 50-150%  |
|         | d3-MeFOSAA             | 78% 50-150%  |
|         | 13C2-4:2FTS            | 80% 50-150%  |
|         | 13C2-6:2FTS            | 83% 50-150%  |
|         | 13C2-8:2FTS            | 84% 50-150%  |

5.1.10  
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# Instrument Blank

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |          |    |          |     |           |            |                  |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| Sample     | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| S4Q62-IBLK | 4Q4395.D | 1  | 08/11/20 | NAF | n/a       | n/a        | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No.        | Compound                      | Result | RL  | MDL  | Units | Q |
|----------------|-------------------------------|--------|-----|------|-------|---|
| 375-22-4       | Perfluorobutanoic acid        | ND     | 1.0 | 0.25 | ug/kg |   |
| 2706-90-3      | Perfluoropentanoic acid       | ND     | 1.0 | 0.20 | ug/kg |   |
| 307-24-4       | Perfluorohexanoic acid        | ND     | 1.0 | 0.20 | ug/kg |   |
| 375-85-9       | Perfluoroheptanoic acid       | ND     | 1.0 | 0.25 | ug/kg |   |
| 335-67-1       | Perfluorooctanoic acid        | ND     | 1.0 | 0.25 | ug/kg |   |
| 375-95-1       | Perfluorononanoic acid        | ND     | 1.0 | 0.25 | ug/kg |   |
| 335-76-2       | Perfluorodecanoic acid        | ND     | 1.0 | 0.25 | ug/kg |   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND     | 1.0 | 0.25 | ug/kg |   |
| 307-55-1       | Perfluorododecanoic acid      | ND     | 1.0 | 0.25 | ug/kg |   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND     | 1.0 | 0.25 | ug/kg |   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND     | 1.0 | 0.25 | ug/kg |   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND     | 1.0 | 0.25 | ug/kg |   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND     | 1.0 | 0.25 | ug/kg |   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND     | 1.0 | 0.25 | ug/kg |   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND     | 1.0 | 0.25 | ug/kg |   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND     | 1.0 | 0.25 | ug/kg |   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND     | 1.0 | 0.25 | ug/kg |   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND     | 1.0 | 0.25 | ug/kg |   |
| 754-91-6       | PFOSA                         | ND     | 1.0 | 0.25 | ug/kg |   |
| 2355-31-9      | MeFOSAA                       | ND     | 2.5 | 0.50 | ug/kg |   |
| 2991-50-6      | EiFOSAA                       | ND     | 2.5 | 0.50 | ug/kg |   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND     | 1.0 | 0.25 | ug/kg |   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND     | 1.0 | 0.25 | ug/kg |   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND     | 1.0 | 0.25 | ug/kg |   |
| 13252-13-6     | HFPO-DA (GenX)                | ND     | 5.0 | 1.3  | ug/kg |   |
| 919005-14-4    | ADONA                         | ND     | 1.0 | 0.25 | ug/kg |   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND     | 1.0 | 0.25 | ug/kg |   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND     | 1.0 | 0.25 | ug/kg |   |

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C4-PFBA              | 100% 50-150% |
|         | 13C5-PFPeA             | 102% 50-150% |
|         | 13C5-PFHxA             | 102% 50-150% |
|         | 13C4-PFHpA             | 103% 50-150% |

5.1.11  
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# Instrument Blank

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| S4Q62-IBLK | 4Q4395.D | 1  | 08/11/20 | NAF | n/a       | n/a        | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M QSM5.3 B-15

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No. | ID Standard Recoveries | Limits       |
|---------|------------------------|--------------|
|         | 13C8-PFOA              | 105% 50-150% |
|         | 13C9-PFNA              | 105% 50-150% |
|         | 13C6-PFDA              | 104% 50-150% |
|         | 13C7-PFUnDA            | 102% 50-150% |
|         | 13C2-PFDoDA            | 101% 50-150% |
|         | 13C2-PFTeDA            | 102% 50-150% |
|         | 13C3-PFBS              | 104% 50-150% |
|         | 13C3-PFHxS             | 105% 50-150% |
|         | 13C8-PFOS              | 101% 50-150% |
|         | 13C8-FOSA              | 111% 50-150% |
|         | d3-MeFOSAA             | 99% 50-150%  |
|         | 13C2-4:2FTS            | 97% 50-150%  |
|         | 13C2-6:2FTS            | 100% 50-150% |
|         | 13C2-8:2FTS            | 96% 50-150%  |

5.1.11  
5

# Blank Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |     |           |            |                  |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| OP81355-BS | 2Q52154.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No.        | Compound                      | Spike ug/l | BSP ug/l | BSP % | Limits |
|----------------|-------------------------------|------------|----------|-------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.08       | 0.0800   | 100   | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 0.08       | 0.0856   | 107   | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 0.08       | 0.0842   | 105   | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 0.08       | 0.0862   | 108   | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.08       | 0.0835   | 104   | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | 0.08       | 0.0879   | 110   | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | 0.08       | 0.0879   | 110   | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.08       | 0.0863   | 108   | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | 0.08       | 0.0842   | 105   | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.08       | 0.0819   | 102   | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.08       | 0.0850   | 106   | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.08       | 0.0854   | 107   | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.08       | 0.0832   | 104   | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.08       | 0.0843   | 105   | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.08       | 0.0866   | 108   | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.08       | 0.0825   | 103   | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.08       | 0.0808   | 101   | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | 0.08       | 0.0721   | 90    | 60-130 |
| 754-91-6       | PFOSA                         | 0.08       | 0.0818   | 102   | 70-130 |
| 2355-31-9      | MeFOSAA                       | 0.08       | 0.0852   | 107   | 70-130 |
| 2991-50-6      | EiFOSAA                       | 0.08       | 0.0852   | 107   | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.08       | 0.0847   | 106   | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.08       | 0.0843   | 105   | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.08       | 0.0851   | 106   | 70-130 |
| 13252-13-6     | HFPO-DA (GenX)                | 0.08       | 0.0977   | 122   | 60-140 |
| 919005-14-4    | ADONA                         | 0.08       | 0.0812   | 102   | 60-140 |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | 0.08       | 0.0857   | 107   | 60-140 |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | 0.08       | 0.0765   | 96    | 60-140 |

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C4-PFBA              | 92% | 35-135% |
|         | 13C5-PFPeA             | 89% | 50-150% |
|         | 13C5-PFHxA             | 85% | 50-150% |
|         | 13C4-PFHpA             | 86% | 50-150% |

\* = Outside of Control Limits.

5.2.1  
5

# Blank Spike Summary

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81355-BS | 2Q52154.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples: Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C8-PFOA              | 88% | 50-150% |
|         | 13C9-PFNA              | 97% | 50-150% |
|         | 13C6-PFDA              | 79% | 50-150% |
|         | 13C7-PFUnDA            | 81% | 40-140% |
|         | 13C2-PFDoDA            | 75% | 40-140% |
|         | 13C2-PFTeDA            | 69% | 30-130% |
|         | 13C3-PFBS              | 88% | 50-150% |
|         | 13C3-PFHxS             | 83% | 50-150% |
|         | 13C8-PFOS              | 81% | 50-150% |
|         | 13C8-FOSA              | 82% | 30-130% |
|         | d3-MeFOSAA             | 77% | 50-150% |
|         | 13C2-4:2FTS            | 84% | 50-150% |
|         | 13C2-6:2FTS            | 88% | 50-150% |
|         | 13C2-8:2FTS            | 77% | 50-150% |
|         | 13C3-HFPO-DA           | 97% | 50-150% |

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |    |           |            |                  |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
| OP81352-BS | 3Q24680.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No.        | Compound                      | Spike ug/l | BSP ug/l | BSP % | Limits |
|----------------|-------------------------------|------------|----------|-------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.08       | 0.0817   | 102   | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 0.08       | 0.0850   | 106   | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 0.08       | 0.0814   | 102   | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 0.08       | 0.0821   | 103   | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.08       | 0.0828   | 104   | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | 0.08       | 0.0853   | 107   | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | 0.08       | 0.0804   | 101   | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.08       | 0.0797   | 100   | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | 0.08       | 0.0817   | 102   | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.08       | 0.0797   | 100   | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.08       | 0.0815   | 102   | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.08       | 0.0842   | 105   | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.08       | 0.0840   | 105   | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.08       | 0.0840   | 105   | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.08       | 0.0878   | 110   | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.08       | 0.0827   | 103   | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.08       | 0.0816   | 102   | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | 0.08       | 0.0739   | 92    | 60-130 |
| 754-91-6       | PFOSA                         | 0.08       | 0.0830   | 104   | 70-130 |
| 2355-31-9      | MeFOSAA                       | 0.08       | 0.0855   | 107   | 70-130 |
| 2991-50-6      | EiFOSAA                       | 0.08       | 0.0778   | 97    | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.08       | 0.0822   | 103   | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.08       | 0.0827   | 103   | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.08       | 0.0839   | 105   | 70-130 |
| 13252-13-6     | HFPO-DA (GenX)                | 0.08       | 0.0772   | 97    | 60-140 |
| 919005-14-4    | ADONA                         | 0.08       | 0.0795   | 99    | 60-140 |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | 0.08       | 0.0733   | 92    | 60-140 |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | 0.08       | 0.0811   | 101   | 60-140 |

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C4-PFBA              | 96% | 35-135% |
|         | 13C5-PFPeA             | 94% | 50-150% |
|         | 13C5-PFHxA             | 95% | 50-150% |
|         | 13C4-PFHpA             | 95% | 50-150% |

\* = Outside of Control Limits.

5.2.2  
5

# Blank Spike Summary

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP81352-BS | 3Q24680.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No. | ID Standard Recoveries | BSP  | Limits  |
|---------|------------------------|------|---------|
|         | 13C8-PFOA              | 93%  | 50-150% |
|         | 13C9-PFNA              | 93%  | 50-150% |
|         | 13C6-PFDA              | 93%  | 50-150% |
|         | 13C7-PFUnDA            | 91%  | 40-140% |
|         | 13C2-PFDoDA            | 82%  | 40-140% |
|         | 13C2-PFTeDA            | 81%  | 30-130% |
|         | 13C3-PFBS              | 95%  | 50-150% |
|         | 13C3-PFHxS             | 94%  | 50-150% |
|         | 13C8-PFOS              | 92%  | 50-150% |
|         | 13C8-FOSA              | 93%  | 30-130% |
|         | d3-MeFOSAA             | 91%  | 50-150% |
|         | 13C2-4:2FTS            | 94%  | 50-150% |
|         | 13C2-6:2FTS            | 96%  | 50-150% |
|         | 13C2-8:2FTS            | 93%  | 50-150% |
|         | 13C3-HFPO-DA           | 103% | 50-150% |

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |     |           |            |                  |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| OP81430-BS | 2Q52452.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No.        | Compound                      | Spike ug/l | BSP ug/l | BSP % | Limits |
|----------------|-------------------------------|------------|----------|-------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.08       | 0.0785   | 98    | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 0.08       | 0.0754   | 94    | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 0.08       | 0.0766   | 96    | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 0.08       | 0.0766   | 96    | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.08       | 0.0802   | 100   | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | 0.08       | 0.0777   | 97    | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | 0.08       | 0.0779   | 97    | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.08       | 0.0783   | 98    | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | 0.08       | 0.0816   | 102   | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.08       | 0.0792   | 99    | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.08       | 0.0837   | 105   | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.08       | 0.0774   | 97    | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.08       | 0.0841   | 105   | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.08       | 0.0720   | 90    | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.08       | 0.0743   | 93    | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.08       | 0.0804   | 101   | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.08       | 0.0767   | 96    | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | 0.08       | 0.0713   | 89    | 60-130 |
| 754-91-6       | PFOSA                         | 0.08       | 0.0740   | 93    | 70-130 |
| 2355-31-9      | MeFOSAA                       | 0.08       | 0.0799   | 100   | 70-130 |
| 2991-50-6      | EiFOSAA                       | 0.08       | 0.0746   | 93    | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.08       | 0.0907   | 113   | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.08       | 0.0801   | 100   | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.08       | 0.0907   | 113   | 70-130 |

| CAS No. | ID Standard Recoveries | BSP  | Limits  |
|---------|------------------------|------|---------|
|         | 13C4-PFBA              | 105% | 35-135% |
|         | 13C5-PFPeA             | 104% | 50-150% |
|         | 13C5-PFHxA             | 110% | 50-150% |
|         | 13C4-PFHpA             | 105% | 50-150% |
|         | 13C8-PFOA              | 106% | 50-150% |
|         | 13C9-PFNA              | 104% | 50-150% |
|         | 13C6-PFDA              | 101% | 50-150% |
|         | 13C7-PFUnDA            | 101% | 40-140% |

\* = Outside of Control Limits.

5.2.3  
5

# Blank Spike Summary

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81430-BS | 2Q52452.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No. | ID Standard Recoveries | BSP  | Limits  |
|---------|------------------------|------|---------|
|         | 13C2-PFDoDA            | 94%  | 40-140% |
|         | 13C2-PFTeDA            | 87%  | 30-130% |
|         | 13C3-PFBS              | 103% | 50-150% |
|         | 13C3-PFHxS             | 111% | 50-150% |
|         | 13C8-PFOS              | 101% | 50-150% |
|         | 13C8-FOSA              | 98%  | 30-130% |
|         | d3-MeFOSAA             | 87%  | 50-150% |
|         | 13C2-4:2FTS            | 105% | 50-150% |
|         | 13C2-6:2FTS            | 104% | 50-150% |
|         | 13C2-8:2FTS            | 102% | 50-150% |

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |           |    |          |     |           |            |                  |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| OP81449-BS | 2Q52537.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No.        | Compound                      | Spike ug/l | BSP ug/l | BSP % | Limits |
|----------------|-------------------------------|------------|----------|-------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.08       | 0.0856   | 107   | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 0.08       | 0.0824   | 103   | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 0.08       | 0.0828   | 104   | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 0.08       | 0.0837   | 105   | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.08       | 0.0863   | 108   | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | 0.08       | 0.0841   | 105   | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | 0.08       | 0.0814   | 102   | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.08       | 0.0837   | 105   | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | 0.08       | 0.0867   | 108   | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.08       | 0.0836   | 105   | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.08       | 0.0898   | 112   | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.08       | 0.0841   | 105   | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.08       | 0.0850   | 106   | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.08       | 0.0806   | 101   | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.08       | 0.0788   | 99    | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.08       | 0.0798   | 100   | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.08       | 0.0805   | 101   | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | 0.08       | 0.0750   | 94    | 60-130 |
| 754-91-6       | PFOSA                         | 0.08       | 0.0803   | 100   | 70-130 |
| 2355-31-9      | MeFOSAA                       | 0.08       | 0.0860   | 108   | 70-130 |
| 2991-50-6      | EiFOSAA                       | 0.08       | 0.0832   | 104   | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.08       | 0.0946   | 118   | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.08       | 0.0859   | 107   | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.08       | 0.0954   | 119   | 70-130 |
| 13252-13-6     | HFPO-DA (GenX)                | 0.08       | 0.0766   | 96    | 60-140 |
| 919005-14-4    | ADONA                         | 0.08       | 0.0821   | 103   | 60-140 |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | 0.08       | 0.0759   | 95    | 60-140 |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | 0.08       | 0.0767   | 96    | 60-140 |

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C4-PFBA              | 97% | 35-135% |
|         | 13C5-PFPeA             | 92% | 50-150% |
|         | 13C5-PFHxA             | 92% | 50-150% |
|         | 13C4-PFHpA             | 92% | 50-150% |

\* = Outside of Control Limits.

5.2.4  
5

# Blank Spike Summary

Job Number: FA77230  
Account: ARCMIL Arcadis  
Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81449-BS | 2Q52537.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No. | ID Standard Recoveries | BSP  | Limits  |
|---------|------------------------|------|---------|
|         | 13C8-PFOA              | 95%  | 50-150% |
|         | 13C9-PFNA              | 92%  | 50-150% |
|         | 13C6-PFDA              | 92%  | 50-150% |
|         | 13C7-PFUnDA            | 87%  | 40-140% |
|         | 13C2-PFDoDA            | 86%  | 40-140% |
|         | 13C2-PFTeDA            | 78%  | 30-130% |
|         | 13C3-PFBS              | 96%  | 50-150% |
|         | 13C3-PFHxS             | 109% | 50-150% |
|         | 13C8-PFOS              | 101% | 50-150% |
|         | 13C8-FOSA              | 95%  | 30-130% |
|         | d3-MeFOSAA             | 75%  | 50-150% |
|         | 13C2-4:2FTS            | 93%  | 50-150% |
|         | 13C2-6:2FTS            | 93%  | 50-150% |
|         | 13C2-8:2FTS            | 92%  | 50-150% |
|         | 13C3-HFPO-DA           | 99%  | 50-150% |

\* = Outside of Control Limits.

# Blank Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

|            |          |    |          |     |           |            |                  |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| Sample     | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
| OP81492-BS | 4Q4438.D | 1  | 08/11/20 | NAF | 08/10/20  | OP81492    | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No.        | Compound                      | Spike<br>ug/kg | BSP<br>ug/kg | BSP<br>% | Limits |
|----------------|-------------------------------|----------------|--------------|----------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 10             | 10.6         | 106      | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 10             | 9.7          | 97       | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 10             | 10.0         | 100      | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 10             | 10           | 100      | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 10             | 10.2         | 102      | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | 10             | 10.1         | 101      | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | 10             | 10.1         | 101      | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | 10             | 10.1         | 101      | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | 10             | 10.4         | 104      | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | 10             | 9.7          | 97       | 70-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | 10             | 9.7          | 97       | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 10             | 10.5         | 105      | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 10             | 9.9          | 99       | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 10             | 10.1         | 101      | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 10             | 10.1         | 101      | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 10             | 9.8          | 98       | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | 10             | 10           | 100      | 70-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | 10             | 9.6          | 96       | 70-130 |
| 754-91-6       | PFOSA                         | 10             | 9.9          | 99       | 70-130 |
| 2355-31-9      | MeFOSAA                       | 10             | 10.4         | 104      | 70-130 |
| 2991-50-6      | EiFOSAA                       | 10             | 10.5         | 105      | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 10             | 10.1         | 101      | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 10             | 9.9          | 99       | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 10             | 9.9          | 99       | 70-130 |
| 13252-13-6     | HFPO-DA (GenX)                | 10             | 9.6          | 96       | 60-140 |
| 919005-14-4    | ADONA                         | 10             | 9.8          | 98       | 60-140 |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | 10             | 9.7          | 97       | 60-140 |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | 10             | 9.6          | 96       | 60-140 |

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C4-PFBA              | 75% | 40-140% |
|         | 13C5-PFPeA             | 83% | 50-150% |
|         | 13C5-PFHxA             | 85% | 50-150% |
|         | 13C4-PFHpA             | 85% | 50-150% |

\* = Outside of Control Limits.

5.2.5  
5

# Blank Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|----------|----|----------|-----|-----------|------------|------------------|
| OP81492-BS | 4Q4438.D | 1  | 08/11/20 | NAF | 08/10/20  | OP81492    | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No. | ID Standard Recoveries | BSP | Limits  |
|---------|------------------------|-----|---------|
|         | 13C8-PFOA              | 87% | 50-150% |
|         | 13C9-PFNA              | 87% | 50-150% |
|         | 13C6-PFDA              | 86% | 50-150% |
|         | 13C7-PFUnDA            | 83% | 40-140% |
|         | 13C2-PFDoDA            | 81% | 40-140% |
|         | 13C2-PFTeDA            | 82% | 30-130% |
|         | 13C3-PFBS              | 84% | 50-150% |
|         | 13C3-PFHxS             | 88% | 50-150% |
|         | 13C8-PFOS              | 85% | 50-150% |
|         | 13C8-FOSA              | 89% | 30-130% |
|         | d3-MeFOSAA             | 82% | 50-150% |
|         | 13C2-4:2FTS            | 86% | 50-150% |
|         | 13C2-6:2FTS            | 88% | 50-150% |
|         | 13C2-8:2FTS            | 84% | 50-150% |
|         | 13C3-HFPO-DA           | 80% | 50-150% |

\* = Outside of Control Limits.

5.2.5  
5

# Matrix Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81355-MS | 2Q52157.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |
| FA77286-1  | 2Q52156.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No.        | Compound                      | FA77286-1<br>ug/l | Spike<br>Q | MS<br>ug/l | MS<br>% | Limits |        |
|----------------|-------------------------------|-------------------|------------|------------|---------|--------|--------|
| 375-22-4       | Perfluorobutanoic acid        | ND                |            | 0.154      | 0.158   | 103    | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | ND                |            | 0.154      | 0.166   | 108    | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | ND                |            | 0.154      | 0.165   | 107    | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | ND                |            | 0.154      | 0.166   | 108    | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.0068            | J          | 0.154      | 0.167   | 104    | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | ND                |            | 0.154      | 0.170   | 110    | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | ND                |            | 0.154      | 0.170   | 110    | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | ND                |            | 0.154      | 0.166   | 108    | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | ND                |            | 0.154      | 0.165   | 107    | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | ND                |            | 0.154      | 0.174   | 113    | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | ND                |            | 0.154      | 0.168   | 109    | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.0081            |            | 0.154      | 0.173   | 107    | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.0065            | J          | 0.154      | 0.161   | 100    | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.0225            |            | 0.154      | 0.190   | 109    | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.0043            | J          | 0.154      | 0.168   | 106    | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.0540            |            | 0.154      | 0.213   | 103    | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND                |            | 0.154      | 0.159   | 103    | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND                |            | 0.154      | 0.150   | 97     | 60-130 |
| 754-91-6       | PFOSA                         | ND                |            | 0.154      | 0.162   | 105    | 70-130 |
| 2355-31-9      | MeFOSAA                       | ND                |            | 0.154      | 0.164   | 107    | 70-130 |
| 2991-50-6      | EiFOSAA                       | ND                |            | 0.154      | 0.174   | 113    | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND                |            | 0.154      | 0.164   | 107    | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND                |            | 0.154      | 0.165   | 107    | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND                |            | 0.154      | 0.167   | 109    | 70-130 |
| 13252-13-6     | HFPO-DA (GenX)                | ND                |            | 0.154      | 0.186   | 121    | 60-140 |
| 919005-14-4    | ADONA                         | ND                |            | 0.154      | 0.161   | 105    | 60-140 |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND                |            | 0.154      | 0.165   | 107    | 60-140 |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND                |            | 0.154      | 0.150   | 97     | 60-140 |

| CAS No. | ID Standard Recoveries | MS   | FA77286-1 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C4-PFBA              | 100% | 96%       | 35-135% |
|         | 13C5-PFPeA             | 108% | 96%       | 50-150% |
|         | 13C5-PFHxA             | 97%  | 93%       | 50-150% |
|         | 13C4-PFHpA             | 96%  | 99%       | 50-150% |

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81355-MS | 2Q52157.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |
| FA77286-1  | 2Q52156.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No. | ID Standard Recoveries | MS   | FA77286-1 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C8-PFOA              | 95%  | 97%       | 50-150% |
|         | 13C9-PFNA              | 110% | 109%      | 50-150% |
|         | 13C6-PFDA              | 90%  | 93%       | 50-150% |
|         | 13C7-PFUnDA            | 87%  | 90%       | 40-140% |
|         | 13C2-PFDoDA            | 88%  | 88%       | 40-140% |
|         | 13C2-PFTeDA            | 82%  | 78%       | 30-130% |
|         | 13C3-PFBS              | 104% | 96%       | 50-150% |
|         | 13C3-PFHxS             | 91%  | 94%       | 50-150% |
|         | 13C8-PFOS              | 92%  | 85%       | 50-150% |
|         | 13C8-FOSA              | 86%  | 77%       | 30-130% |
|         | d3-MeFOSAA             | 89%  | 87%       | 50-150% |
|         | 13C2-4:2FTS            | 96%  | 88%       | 50-150% |
|         | 13C2-6:2FTS            | 95%  | 91%       | 50-150% |
|         | 13C2-8:2FTS            | 91%  | 90%       | 50-150% |
|         | 13C3-HFPO-DA           | 109% |           | 50-150% |

\* = Outside of Control Limits.

5.3.1  
5

# Matrix Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP81352-MS | 3Q24695.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |
| FA77232-13 | 3Q24694.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No.        | Compound                      | FA77232-13<br>ug/l | Spike<br>Q | MS<br>ug/l | MS<br>% | Limits |
|----------------|-------------------------------|--------------------|------------|------------|---------|--------|
| 375-22-4       | Perfluorobutanoic acid        | ND                 | 0.154      | 0.159      | 103     | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | ND                 | 0.154      | 0.168      | 109     | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | ND                 | 0.154      | 0.158      | 103     | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | ND                 | 0.154      | 0.158      | 103     | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | ND                 | 0.154      | 0.160      | 104     | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | ND                 | 0.154      | 0.167      | 109     | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | ND                 | 0.154      | 0.157      | 102     | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | ND                 | 0.154      | 0.152      | 99      | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | ND                 | 0.154      | 0.161      | 105     | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | ND                 | 0.154      | 0.161      | 105     | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | ND                 | 0.154      | 0.158      | 103     | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND                 | 0.154      | 0.162      | 105     | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND                 | 0.154      | 0.159      | 103     | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND                 | 0.154      | 0.161      | 105     | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND                 | 0.154      | 0.165      | 107     | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND                 | 0.154      | 0.157      | 102     | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND                 | 0.154      | 0.163      | 106     | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND                 | 0.154      | 0.161      | 105     | 60-130 |
| 754-91-6       | PFOSA                         | ND                 | 0.154      | 0.158      | 103     | 70-130 |
| 2355-31-9      | MeFOSAA                       | ND                 | 0.154      | 0.165      | 107     | 70-130 |
| 2991-50-6      | EiFOSAA                       | ND                 | 0.154      | 0.170      | 110     | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND                 | 0.154      | 0.159      | 103     | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND                 | 0.154      | 0.158      | 103     | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND                 | 0.154      | 0.162      | 105     | 70-130 |
| 13252-13-6     | HFPO-DA (GenX)                | ND                 | 0.154      | 0.147      | 96      | 60-140 |
| 919005-14-4    | ADONA                         | ND                 | 0.154      | 0.158      | 103     | 60-140 |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND                 | 0.154      | 0.141      | 92      | 60-140 |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND                 | 0.154      | 0.160      | 104     | 60-140 |

| CAS No. | ID Standard Recoveries | MS  | FA77232-13 | Limits  |
|---------|------------------------|-----|------------|---------|
|         | 13C4-PFBA              | 86% | 100%       | 35-135% |
|         | 13C5-PFPeA             | 86% | 100%       | 50-150% |
|         | 13C5-PFHxA             | 85% | 100%       | 50-150% |
|         | 13C4-PFHpA             | 85% | 100%       | 50-150% |

\* = Outside of Control Limits.

5.3.2  
5

# Matrix Spike Summary

**Job Number:** FA77230  
**Account:** ARCMIL Arcadis  
**Project:** Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|----|-----------|------------|------------------|
| OP81352-MS | 3Q24695.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |
| FA77232-13 | 3Q24694.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No. | ID Standard Recoveries | MS   | FA77232-13 | Limits  |
|---------|------------------------|------|------------|---------|
|         | 13C8-PFOA              | 82%  | 98%        | 50-150% |
|         | 13C9-PFNA              | 84%  | 100%       | 50-150% |
|         | 13C6-PFDA              | 85%  | 103%       | 50-150% |
|         | 13C7-PFUnDA            | 86%  | 103%       | 40-140% |
|         | 13C2-PFDoDA            | 88%  | 100%       | 40-140% |
|         | 13C2-PFTeDA            | 84%  | 98%        | 30-130% |
|         | 13C3-PFBS              | 85%  | 100%       | 50-150% |
|         | 13C3-PFHxS             | 83%  | 96%        | 50-150% |
|         | 13C8-PFOS              | 85%  | 100%       | 50-150% |
|         | 13C8-FOSA              | 86%  | 103%       | 30-130% |
|         | d3-MeFOSAA             | 86%  | 101%       | 50-150% |
|         | 13C2-4:2FTS            | 85%  | 95%        | 50-150% |
|         | 13C2-6:2FTS            | 100% | 119%       | 50-150% |
|         | 13C2-8:2FTS            | 86%  | 96%        | 50-150% |
|         | 13C3-HFPO-DA           | 97%  |            | 50-150% |

\* = Outside of Control Limits.

5.3.2  
5

# Matrix Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81430-MS | 2Q52460.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |
| FA77396-2  | 2Q52459.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No.        | Compound                      | FA77396-2<br>ug/l | Spike<br>Q | MS<br>ug/l | MS<br>% | Limits |
|----------------|-------------------------------|-------------------|------------|------------|---------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.017 U           |            | 0.167      | 98      | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 0.0060 J          |            | 0.167      | 93      | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 0.0044 J          |            | 0.167      | 93      | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 0.0059 J          |            | 0.167      | 94      | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.0036 J          |            | 0.167      | 99      | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | 0.0083 U          |            | 0.167      | 97      | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | 0.0083 U          |            | 0.167      | 95      | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.0083 U          |            | 0.167      | 97      | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | 0.0083 U          |            | 0.167      | 99      | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.0083 U          |            | 0.167      | 97      | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.0083 U          |            | 0.167      | 103     | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.0083 U          |            | 0.167      | 95      | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.0083 U          |            | 0.167      | 98      | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.0049 J          |            | 0.167      | 95      | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.0083 U          |            | 0.167      | 91      | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.0190            |            | 0.167      | 91      | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.0083 U          |            | 0.167      | 90      | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | 0.0083 U          |            | 0.167      | 83      | 60-130 |
| 754-91-6       | PFOSA                         | 0.0083 U          |            | 0.167      | 92      | 70-130 |
| 2355-31-9      | MeFOSAA                       | 0.017 U           |            | 0.167      | 98      | 70-130 |
| 2991-50-6      | EiFOSAA                       | 0.017 U           |            | 0.167      | 97      | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.017 U           |            | 0.167      | 109     | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.017 U           |            | 0.167      | 100     | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.017 U           |            | 0.167      | 113     | 70-130 |

| CAS No. | ID Standard Recoveries | MS   | FA77396-2 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C4-PFBA              | 104% |           | 35-135% |
|         | 13C5-PFPeA             | 100% |           | 50-150% |
|         | 13C5-PFHxA             | 100% | 99%       | 50-150% |
|         | 13C4-PFHpA             | 101% | 93%       | 50-150% |
|         | 13C8-PFOA              | 104% | 93%       | 50-150% |
|         | 13C9-PFNA              | 102% | 92%       | 50-150% |
|         | 13C6-PFDA              | 101% | 91%       | 50-150% |
|         | 13C7-PFUnDA            | 99%  | 88%       | 40-140% |

\* = Outside of Control Limits.

5.3.3  
5

# Matrix Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81430-MS | 2Q52460.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |
| FA77396-2  | 2Q52459.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No. | ID Standard Recoveries | MS   | FA77396-2 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C2-PFDoDA            | 96%  | 85%       | 40-140% |
|         | 13C2-PFTeDA            | 88%  | 77%       | 30-130% |
|         | 13C3-PFBS              | 100% | 91%       | 50-150% |
|         | 13C3-PFHxS             | 112% | 99%       | 50-150% |
|         | 13C8-PFOS              | 104% | 92%       | 50-150% |
|         | 13C8-FOSA              | 94%  |           | 30-130% |
|         | d3-MeFOSAA             | 84%  | 73%       | 50-150% |
|         | 13C2-4:2FTS            | 96%  |           | 50-150% |
|         | 13C2-6:2FTS            | 98%  |           | 50-150% |
|         | 13C2-8:2FTS            | 100% |           | 50-150% |
|         | 13C3-HFPO-DA           |      | 99%       | 50-150% |

\* = Outside of Control Limits.

5.3.3  
5

# Matrix Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81449-MS | 2Q52546.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |
| FA77413-6  | 2Q52545.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No.        | Compound                      | FA77413-6<br>ug/l | Spike<br>Q | MS<br>ug/l | MS<br>% | Limits |        |
|----------------|-------------------------------|-------------------|------------|------------|---------|--------|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.0092            | J          | 0.167      | 0.189   | 108    | 70-130 |
| 2706-90-3      | Perfluoropentanoic acid       | 0.0109            |            | 0.167      | 0.186   | 105    | 70-130 |
| 307-24-4       | Perfluorohexanoic acid        | 0.0149            |            | 0.167      | 0.183   | 101    | 70-130 |
| 375-85-9       | Perfluoroheptanoic acid       | 0.0119            |            | 0.167      | 0.168   | 94     | 70-130 |
| 335-67-1       | Perfluorooctanoic acid        | 0.0030            | J          | 0.167      | 0.181   | 107    | 70-130 |
| 375-95-1       | Perfluorononanoic acid        | ND                |            | 0.167      | 0.176   | 106    | 70-130 |
| 335-76-2       | Perfluorodecanoic acid        | ND                |            | 0.167      | 0.168   | 101    | 70-130 |
| 2058-94-8      | Perfluoroundecanoic acid      | ND                |            | 0.167      | 0.172   | 103    | 70-130 |
| 307-55-1       | Perfluorododecanoic acid      | ND                |            | 0.167      | 0.180   | 108    | 70-130 |
| 72629-94-8     | Perfluorotridecanoic acid     | ND                |            | 0.167      | 0.183   | 110    | 65-130 |
| 376-06-7       | Perfluorotetradecanoic acid   | ND                |            | 0.167      | 0.184   | 110    | 70-130 |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.0029            | J          | 0.167      | 0.176   | 104    | 70-130 |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND                |            | 0.167      | 0.179   | 107    | 70-130 |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.0253            |            | 0.167      | 0.191   | 99     | 70-130 |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND                |            | 0.167      | 0.162   | 97     | 70-130 |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND                |            | 0.167      | 0.167   | 100    | 70-130 |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND                |            | 0.167      | 0.163   | 98     | 65-130 |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND                |            | 0.167      | 0.174   | 104    | 60-130 |
| 754-91-6       | PFOSA                         | ND                |            | 0.167      | 0.169   | 101    | 70-130 |
| 2355-31-9      | MeFOSAA                       | ND                |            | 0.167      | 0.189   | 113    | 70-130 |
| 2991-50-6      | EiFOSAA                       | ND                |            | 0.167      | 0.190   | 114    | 70-130 |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND                |            | 0.167      | 0.196   | 118    | 70-130 |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND                |            | 0.167      | 0.178   | 107    | 70-130 |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND                |            | 0.167      | 0.200   | 120    | 70-130 |
| 13252-13-6     | HFPO-DA (GenX)                | ND                |            | 0.167      | 0.157   | 94     | 60-140 |
| 919005-14-4    | ADONA                         | ND                |            | 0.167      | 0.175   | 105    | 60-140 |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND                |            | 0.167      | 0.166   | 100    | 60-140 |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND                |            | 0.167      | 0.176   | 106    | 60-140 |

| CAS No. | ID Standard Recoveries | MS  | FA77413-6 | Limits  |
|---------|------------------------|-----|-----------|---------|
|         | 13C4-PFBA              | 82% | 72%       | 35-135% |
|         | 13C5-PFPeA             | 77% | 71%       | 50-150% |
|         | 13C5-PFHxA             | 81% | 75%       | 50-150% |
|         | 13C4-PFHpA             | 79% | 79%       | 50-150% |

\* = Outside of Control Limits.

5.3.4  
5

# Matrix Spike Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample     | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81449-MS | 2Q52546.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |
| FA77413-6  | 2Q52545.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No. | ID Standard Recoveries | MS     | FA77413-6 | Limits  |
|---------|------------------------|--------|-----------|---------|
|         | 13C8-PFOA              | 81%    | 81%       | 50-150% |
|         | 13C9-PFNA              | 81%    | 74%       | 50-150% |
|         | 13C6-PFDA              | 77%    | 74%       | 50-150% |
|         | 13C7-PFUnDA            | 81%    | 77%       | 40-140% |
|         | 13C2-PFDoDA            | 78%    | 76%       | 40-140% |
|         | 13C2-PFTeDA            | 71%    | 71%       | 30-130% |
|         | 13C3-PFBS              | 88%    | 81%       | 50-150% |
|         | 13C3-PFHxS             | 98%    | 97%       | 50-150% |
|         | 13C8-PFOS              | 89%    | 81%       | 50-150% |
|         | 13C8-FOSA              | 72%    | 73%       | 30-130% |
|         | d3-MeFOSAA             | 48%* a | 49%* a    | 50-150% |
|         | 13C2-4:2FTS            | 74%    | 67%       | 50-150% |
|         | 13C2-6:2FTS            | 75%    | 72%       | 50-150% |
|         | 13C2-8:2FTS            | 72%    | 66%       | 50-150% |
|         | 13C3-HFPO-DA           | 90%    |           | 50-150% |

(a) Outside control limits due to matrix interference.

\* = Outside of Control Limits.

5.3.4  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|-----|-----------|------------|------------------|
| OP81492-MS  | 4Q4455.D | 1  | 08/12/20 | NAF | 08/10/20  | OP81492    | S4Q62            |
| OP81492-MSD | 4Q4456.D | 1  | 08/12/20 | NAF | 08/10/20  | OP81492    | S4Q62            |
| FA77314-1   | 4Q4461.D | 1  | 08/12/20 | NAF | 08/10/20  | OP81492    | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No.        | Compound                      | FA77314-1<br>ug/kg | Spike<br>Q | ug/kg | MS<br>ug/kg | MS<br>% | Spike<br>ug/kg | MSD<br>ug/kg | MSD<br>% | RPD       | Limits<br>Rec/RPD |
|----------------|-------------------------------|--------------------|------------|-------|-------------|---------|----------------|--------------|----------|-----------|-------------------|
| 375-22-4       | Perfluorobutanoic acid        | ND                 | 9.14       | 9.0   | 98          | 9.99    | 10.0           | 100          | 11       | 70-130/30 |                   |
| 2706-90-3      | Perfluoropentanoic acid       | ND                 | 9.14       | 8.5   | 93          | 9.99    | 9.5            | 95           | 11       | 70-130/30 |                   |
| 307-24-4       | Perfluorohexanoic acid        | ND                 | 9.14       | 8.7   | 95          | 9.99    | 9.7            | 97           | 11       | 70-130/30 |                   |
| 375-85-9       | Perfluoroheptanoic acid       | ND                 | 9.14       | 8.9   | 97          | 9.99    | 9.9            | 99           | 11       | 70-130/30 |                   |
| 335-67-1       | Perfluorooctanoic acid        | ND                 | 9.14       | 9.0   | 98          | 9.99    | 9.9            | 99           | 10       | 70-130/30 |                   |
| 375-95-1       | Perfluorononanoic acid        | ND                 | 9.14       | 9.0   | 98          | 9.99    | 9.8            | 98           | 9        | 70-130/30 |                   |
| 335-76-2       | Perfluorodecanoic acid        | ND                 | 9.14       | 8.9   | 97          | 9.99    | 9.8            | 98           | 10       | 70-130/30 |                   |
| 2058-94-8      | Perfluoroundecanoic acid      | ND                 | 9.14       | 8.9   | 97          | 9.99    | 9.7            | 97           | 9        | 70-130/30 |                   |
| 307-55-1       | Perfluorododecanoic acid      | ND                 | 9.14       | 9.1   | 100         | 9.99    | 10.1           | 101          | 10       | 70-130/30 |                   |
| 72629-94-8     | Perfluorotridecanoic acid     | ND                 | 9.14       | 8.4   | 92          | 9.99    | 9.4            | 94           | 11       | 70-130/30 |                   |
| 376-06-7       | Perfluorotetradecanoic acid   | ND                 | 9.14       | 8.4   | 92          | 9.99    | 9.4            | 94           | 11       | 70-130/30 |                   |
| 375-73-5       | Perfluorobutanesulfonic acid  | ND                 | 9.14       | 8.9   | 97          | 9.99    | 9.9            | 99           | 11       | 70-130/30 |                   |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND                 | 9.14       | 8.5   | 93          | 9.99    | 9.3            | 93           | 9        | 70-130/30 |                   |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND                 | 9.14       | 8.9   | 97          | 9.99    | 10.1           | 101          | 13       | 70-130/30 |                   |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND                 | 9.14       | 8.9   | 97          | 9.99    | 10.2           | 102          | 14       | 70-130/30 |                   |
| 1763-23-1      | Perfluorooctanesulfonic acid  | ND                 | 9.14       | 8.5   | 93          | 9.99    | 9.9            | 99           | 15       | 70-130/30 |                   |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND                 | 9.14       | 8.4   | 92          | 9.99    | 9.7            | 97           | 14       | 70-130/30 |                   |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND                 | 9.14       | 8.4   | 92          | 9.99    | 9.0            | 90           | 7        | 70-130/30 |                   |
| 754-91-6       | PFOSA                         | ND                 | 9.14       | 8.8   | 96          | 9.99    | 9.5            | 95           | 8        | 70-130/30 |                   |
| 2355-31-9      | MeFOSAA                       | ND                 | 9.14       | 9.0   | 98          | 9.99    | 9.7            | 97           | 7        | 70-130/30 |                   |
| 2991-50-6      | EtFOSAA                       | ND                 | 9.14       | 9.2   | 101         | 9.99    | 10             | 100          | 8        | 70-130/30 |                   |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND                 | 9.14       | 8.8   | 96          | 9.99    | 9.7            | 97           | 10       | 70-130/30 |                   |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND                 | 9.14       | 8.6   | 94          | 9.99    | 9.5            | 95           | 10       | 70-130/30 |                   |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND                 | 9.14       | 8.7   | 95          | 9.99    | 9.8            | 98           | 12       | 70-130/30 |                   |
| 13252-13-6     | HFPO-DA (GenX)                | ND                 | 9.14       | 8.6   | 94          | 9.99    | 9.2            | 92           | 7        | 60-140/30 |                   |
| 919005-14-4    | ADONA                         | ND                 | 9.14       | 8.6   | 94          | 9.99    | 9.6            | 96           | 11       | 60-140/30 |                   |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND                 | 9.14       | 8.4   | 92          | 9.99    | 9.3            | 93           | 10       | 60-140/30 |                   |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND                 | 9.14       | 8.4   | 92          | 9.99    | 9.1            | 91           | 8        | 60-140/30 |                   |

| CAS No.    | ID Standard Recoveries | MS  | MSD | FA77314-1 | Limits  |
|------------|------------------------|-----|-----|-----------|---------|
| 13C4-PFBA  |                        | 76% | 82% |           | 40-140% |
| 13C5-PFPeA |                        | 87% | 94% |           | 50-150% |
| 13C5-PFHxA |                        | 89% | 96% |           | 50-150% |
| 13C4-PFHpA |                        | 90% | 97% |           | 50-150% |

\* = Outside of Control Limits.

5.4.1  
5

# Matrix Spike/Matrix Spike Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID  | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|----------|----|----------|-----|-----------|------------|------------------|
| OP81492-MS  | 4Q4455.D | 1  | 08/12/20 | NAF | 08/10/20  | OP81492    | S4Q62            |
| OP81492-MSD | 4Q4456.D | 1  | 08/12/20 | NAF | 08/10/20  | OP81492    | S4Q62            |
| FA77314-1   | 4Q4461.D | 1  | 08/12/20 | NAF | 08/10/20  | OP81492    | S4Q62            |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-1, FA77230-2, FA77230-3, FA77230-4, FA77230-5, FA77230-6, FA77230-7

| CAS No.      | ID Standard Recoveries | MS  | MSD  | FA77314-1 | Limits  |
|--------------|------------------------|-----|------|-----------|---------|
| 13C8-PFOA    |                        | 92% | 99%  | 90%       | 50-150% |
| 13C9-PFNA    |                        | 89% | 96%  |           | 50-150% |
| 13C6-PFDA    |                        | 88% | 94%  |           | 50-150% |
| 13C7-PFUnDA  |                        | 84% | 90%  |           | 40-140% |
| 13C2-PFDoDA  |                        | 81% | 87%  |           | 40-140% |
| 13C2-PFTeDA  |                        | 83% | 88%  |           | 30-130% |
| 13C3-PFBS    |                        | 89% | 96%  |           | 50-150% |
| 13C3-PFHxS   |                        | 91% | 95%  |           | 50-150% |
| 13C8-PFOS    |                        | 88% | 91%  | 83%       | 50-150% |
| 13C8-FOSA    |                        | 96% | 105% |           | 30-130% |
| d3-MeFOSAA   |                        | 88% | 95%  |           | 50-150% |
| 13C2-4:2FTS  |                        | 90% | 98%  |           | 50-150% |
| 13C2-6:2FTS  |                        | 93% | 100% |           | 50-150% |
| 13C2-8:2FTS  |                        | 89% | 94%  |           | 50-150% |
| 13C3-HFPO-DA |                        | 87% | 94%  |           | 50-150% |

\* = Outside of Control Limits.

5.4.1  
5

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81355-DUP | 2Q52165.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |
| FA77286-6   | 2Q52164.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No.        | Compound                      | FA77286-6 |   | DUP    |   | RPD | Limits |
|----------------|-------------------------------|-----------|---|--------|---|-----|--------|
|                |                               | ug/l      | Q | ug/l   | Q |     |        |
| 375-22-4       | Perfluorobutanoic acid        | 0.0039    | J | 0.0042 | J | 7   | 30     |
| 2706-90-3      | Perfluoropentanoic acid       | 0.0114    |   | 0.0130 |   | 13  | 30     |
| 307-24-4       | Perfluorohexanoic acid        | 0.0075    | J | 0.0084 |   | 11  | 30     |
| 375-85-9       | Perfluoroheptanoic acid       | 0.0037    | J | 0.0040 | J | 8   | 30     |
| 335-67-1       | Perfluorooctanoic acid        | 0.0049    | J | 0.0054 | J | 10  | 30     |
| 375-95-1       | Perfluorononanoic acid        | ND        |   | ND     |   | nc  | 30     |
| 335-76-2       | Perfluorodecanoic acid        | ND        |   | ND     |   | nc  | 30     |
| 2058-94-8      | Perfluoroundecanoic acid      | ND        |   | ND     |   | nc  | 30     |
| 307-55-1       | Perfluorododecanoic acid      | ND        |   | ND     |   | nc  | 30     |
| 72629-94-8     | Perfluorotridecanoic acid     | ND        |   | ND     |   | nc  | 30     |
| 376-06-7       | Perfluorotetradecanoic acid   | ND        |   | ND     |   | nc  | 30     |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.0032    | J | 0.0039 | J | 20  | 30     |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND        |   | ND     |   | nc  | 30     |
| 355-46-4       | Perfluorohexanesulfonic acid  | ND        |   | ND     |   | nc  | 30     |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND        |   | ND     |   | nc  | 30     |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.0075    | J | 0.0067 | J | 11  | 30     |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND        |   | ND     |   | nc  | 30     |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND        |   | ND     |   | nc  | 30     |
| 754-91-6       | PFOSA                         | ND        |   | ND     |   | nc  | 30     |
| 2355-31-9      | MeFOSAA                       | ND        |   | ND     |   | nc  | 30     |
| 2991-50-6      | EiFOSAA                       | ND        |   | ND     |   | nc  | 30     |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND        |   | ND     |   | nc  | 30     |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND        |   | ND     |   | nc  | 30     |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND        |   | ND     |   | nc  | 30     |
| 13252-13-6     | HFPO-DA (GenX)                | ND        |   | ND     |   | nc  | 30     |
| 919005-14-4    | ADONA                         | ND        |   | ND     |   | nc  | 30     |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND        |   | ND     |   | nc  | 30     |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND        |   | ND     |   | nc  | 30     |

| CAS No. | ID Standard Recoveries | DUP | FA77286-6 | Limits  |
|---------|------------------------|-----|-----------|---------|
|         | 13C4-PFBA              | 82% | 83%       | 35-135% |
|         | 13C5-PFPeA             | 81% | 82%       | 50-150% |
|         | 13C5-PFHxA             | 81% | 81%       | 50-150% |
|         | 13C4-PFHpA             | 83% | 88%       | 50-150% |

\* = Outside of Control Limits.

5.5.1  
5

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81355-DUP | 2Q52165.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |
| FA77286-6   | 2Q52164.D | 1  | 08/03/20 | NAF | 07/31/20  | OP81355    | S2Q776           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-8, FA77230-9, FA77230-10, FA77230-11, FA77230-12, FA77230-13, FA77230-14, FA77230-16

| CAS No. | ID Standard Recoveries | DUP | FA77286-6 | Limits  |
|---------|------------------------|-----|-----------|---------|
|         | 13C8-PFOA              | 86% | 91%       | 50-150% |
|         | 13C9-PFNA              | 96% | 103%      | 50-150% |
|         | 13C6-PFDA              | 83% | 86%       | 50-150% |
|         | 13C7-PFUnDA            | 84% | 78%       | 40-140% |
|         | 13C2-PFDoDA            | 82% | 74%       | 40-140% |
|         | 13C2-PFTeDA            | 75% | 69%       | 30-130% |
|         | 13C3-PFBS              | 83% | 79%       | 50-150% |
|         | 13C3-PFHxS             | 81% | 83%       | 50-150% |
|         | 13C8-PFOS              | 78% | 81%       | 50-150% |
|         | 13C8-FOSA              | 81% | 79%       | 30-130% |
|         | d3-MeFOSAA             | 84% | 82%       | 50-150% |
|         | 13C2-4:2FTS            | 78% | 79%       | 50-150% |
|         | 13C2-6:2FTS            | 86% | 89%       | 50-150% |
|         | 13C2-8:2FTS            | 85% | 86%       | 50-150% |
|         | 13C3-HFPO-DA           | 94% |           | 50-150% |

\* = Outside of Control Limits.

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| OP81352-DUP | 3Q24692.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |
| FA77232-6   | 3Q24691.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No.        | Compound                      | FA77232-6<br>ug/l | DUP<br>Q ug/l | Q  | RPD | Limits |
|----------------|-------------------------------|-------------------|---------------|----|-----|--------|
| 375-22-4       | Perfluorobutanoic acid        | 0.155             | 0.149         | 4  |     | 30     |
| 2706-90-3      | Perfluoropentanoic acid       | 0.473             | 0.470         | 1  |     | 30     |
| 307-24-4       | Perfluorohexanoic acid        | 0.184             | 0.182         | 1  |     | 30     |
| 375-85-9       | Perfluoroheptanoic acid       | 0.363             | 0.362         | 0  |     | 30     |
| 335-67-1       | Perfluorooctanoic acid        | 0.403             | 0.403         | 0  |     | 30     |
| 375-95-1       | Perfluorononanoic acid        | 0.191             | 0.189         | 1  |     | 30     |
| 335-76-2       | Perfluorodecanoic acid        | 0.138             | 0.134         | 3  |     | 30     |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.302             | 0.286         | 5  |     | 30     |
| 307-55-1       | Perfluorododecanoic acid      | 0.480             | 0.453         | 6  |     | 30     |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.541             | 0.517         | 5  |     | 30     |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.223             | 0.209         | 6  |     | 30     |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.151             | 0.151         | 0  |     | 30     |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.432             | 0.433         | 0  |     | 30     |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.185             | 0.182         | 2  |     | 30     |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND                | ND            | nc |     | 30     |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.466             | 0.475         | 2  |     | 30     |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.463             | 0.462         | 0  |     | 30     |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND                | ND            | nc |     | 30     |
| 754-91-6       | PFOSA                         | 0.338             | 0.319         | 6  |     | 30     |
| 2355-31-9      | MeFOSAA                       | 0.167             | 0.161         | 4  |     | 30     |
| 2991-50-6      | EiFOSAA                       | 0.144             | 0.125         | 14 |     | 30     |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.146             | 0.145         | 1  |     | 30     |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.380             | 0.378         | 1  |     | 30     |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.359             | 0.350         | 3  |     | 30     |
| 13252-13-6     | HFPO-DA (GenX)                | 0.115             | 0.112         | 3  |     | 30     |
| 919005-14-4    | ADONA                         | 0.457             | 0.455         | 0  |     | 30     |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | 0.188             | 0.190         | 1  |     | 30     |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | 0.151             | 0.141         | 7  |     | 30     |

| CAS No. | ID Standard Recoveries | DUP  | FA77232-6 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C4-PFBA              | 97%  | 94%       | 35-135% |
|         | 13C5-PFPeA             | 101% | 97%       | 50-150% |
|         | 13C5-PFHxA             | 102% | 95%       | 50-150% |
|         | 13C4-PFHpA             | 103% | 98%       | 50-150% |

\* = Outside of Control Limits.

5.5.2  
5

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|----|-----------|------------|------------------|
| OP81352-DUP | 3Q24692.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |
| FA77232-6   | 3Q24691.D | 1  | 08/05/20 | NG | 08/01/20  | OP81352    | S3Q375           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-18

| CAS No. | ID Standard Recoveries | DUP  | FA77232-6 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C8-PFOA              | 97%  | 92%       | 50-150% |
|         | 13C9-PFNA              | 97%  | 93%       | 50-150% |
|         | 13C6-PFDA              | 101% | 100%      | 50-150% |
|         | 13C7-PFUnDA            | 103% | 96%       | 40-140% |
|         | 13C2-PFDoDA            | 96%  | 89%       | 40-140% |
|         | 13C2-PFTeDA            | 86%  | 83%       | 30-130% |
|         | 13C3-PFBS              | 104% | 99%       | 50-150% |
|         | 13C3-PFHxS             | 106% | 98%       | 50-150% |
|         | 13C8-PFOS              | 97%  | 95%       | 50-150% |
|         | 13C8-FOSA              | 87%  | 82%       | 30-130% |
|         | d3-MeFOSAA             | 99%  | 89%       | 50-150% |
|         | 13C2-4:2FTS            | 101% | 94%       | 50-150% |
|         | 13C2-6:2FTS            | 106% | 101%      | 50-150% |
|         | 13C2-8:2FTS            | 108% | 107%      | 50-150% |
|         | 13C3-HFPO-DA           | 114% |           | 50-150% |

\* = Outside of Control Limits.

5.5.2  
5

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81430-DUP | 2Q52466.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |
| FA77396-5   | 2Q52465.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No.        | Compound                      | FA77396-5 |          | Q | RPD | Limits |
|----------------|-------------------------------|-----------|----------|---|-----|--------|
|                |                               | ug/l      | DUP ug/l |   |     |        |
| 375-22-4       | Perfluorobutanoic acid        | 0.017 U   | ND       |   | nc  | 30     |
| 2706-90-3      | Perfluoropentanoic acid       | 0.0083 U  | ND       |   | nc  | 30     |
| 307-24-4       | Perfluorohexanoic acid        | 0.0028 J  | 0.0026 J |   | 7   | 30     |
| 375-85-9       | Perfluoroheptanoic acid       | 0.0083 U  | ND       |   | nc  | 30     |
| 335-67-1       | Perfluorooctanoic acid        | 0.0039 J  | 0.0038 J |   | 3   | 30     |
| 375-95-1       | Perfluorononanoic acid        | 0.0083 U  | ND       |   | nc  | 30     |
| 335-76-2       | Perfluorodecanoic acid        | 0.0083 U  | ND       |   | nc  | 30     |
| 2058-94-8      | Perfluoroundecanoic acid      | 0.0083 U  | ND       |   | nc  | 30     |
| 307-55-1       | Perfluorododecanoic acid      | 0.0083 U  | ND       |   | nc  | 30     |
| 72629-94-8     | Perfluorotridecanoic acid     | 0.0083 U  | ND       |   | nc  | 30     |
| 376-06-7       | Perfluorotetradecanoic acid   | 0.0083 U  | ND       |   | nc  | 30     |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.0083 U  | ND       |   | nc  | 30     |
| 2706-91-4      | Perfluoropentanesulfonic acid | 0.0083 U  | ND       |   | nc  | 30     |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.0081 J  | 0.0081 J |   | 0   | 30     |
| 375-92-8       | Perfluoroheptanesulfonic acid | 0.0083 U  | ND       |   | nc  | 30     |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.0097    | 0.0096   |   | 1   | 30     |
| 68259-12-1     | Perfluorononanesulfonic acid  | 0.0083 U  | ND       |   | nc  | 30     |
| 335-77-3       | Perfluorodecanesulfonic acid  | 0.0083 U  | ND       |   | nc  | 30     |
| 754-91-6       | PFOSA                         | 0.0083 U  | ND       |   | nc  | 30     |
| 2355-31-9      | MeFOSAA                       | 0.017 U   | ND       |   | nc  | 30     |
| 2991-50-6      | EiFOSAA                       | 0.017 U   | ND       |   | nc  | 30     |
| 757124-72-44:2 | Fluorotelomer sulfonate       | 0.017 U   | ND       |   | nc  | 30     |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | 0.017 U   | ND       |   | nc  | 30     |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | 0.017 U   | ND       |   | nc  | 30     |

| CAS No. | ID Standard Recoveries | DUP  | FA77396-5 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C4-PFBA              | 106% |           | 35-135% |
|         | 13C5-PFPeA             | 99%  |           | 50-150% |
|         | 13C5-PFHxA             | 103% | 90%       | 50-150% |
|         | 13C4-PFHpA             | 107% | 88%       | 50-150% |
|         | 13C8-PFOA              | 108% | 93%       | 50-150% |
|         | 13C9-PFNA              | 103% | 89%       | 50-150% |
|         | 13C6-PFDA              | 103% | 89%       | 50-150% |
|         | 13C7-PFUnDA            | 98%  | 86%       | 40-140% |

\* = Outside of Control Limits.

5.5.3  
5

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81430-DUP | 2Q52466.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |
| FA77396-5   | 2Q52465.D | 1  | 08/07/20 | NAF | 08/06/20  | OP81430    | S2Q780           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-15

| CAS No. | ID Standard Recoveries | DUP  | FA77396-5 | Limits  |
|---------|------------------------|------|-----------|---------|
|         | 13C2-PFDoDA            | 99%  | 87%       | 40-140% |
|         | 13C2-PFTeDA            | 87%  | 76%       | 30-130% |
|         | 13C3-PFBS              | 102% | 89%       | 50-150% |
|         | 13C3-PFHxS             | 114% | 96%       | 50-150% |
|         | 13C8-PFOS              | 105% | 90%       | 50-150% |
|         | 13C8-FOSA              | 96%  |           | 30-130% |
|         | d3-MeFOSAA             | 85%  | 74%       | 50-150% |
|         | 13C2-4:2FTS            | 94%  |           | 50-150% |
|         | 13C2-6:2FTS            | 99%  |           | 50-150% |
|         | 13C2-8:2FTS            | 97%  |           | 50-150% |
|         | 13C3-HFPO-DA           |      | 95%       | 50-150% |

\* = Outside of Control Limits.

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81449-DUP | 2Q52554.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |
| FA77413-11  | 2Q52553.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No.        | Compound                      | FA77413-11 DUP |          | Q | RPD | Limits |
|----------------|-------------------------------|----------------|----------|---|-----|--------|
|                |                               | ug/l           | Q ug/l   |   |     |        |
| 375-22-4       | Perfluorobutanoic acid        | ND             | ND       |   | nc  | 30     |
| 2706-90-3      | Perfluoropentanoic acid       | ND             | ND       |   | nc  | 30     |
| 307-24-4       | Perfluorohexanoic acid        | 0.0029         | J 0.0029 | J | 0   | 30     |
| 375-85-9       | Perfluoroheptanoic acid       | 0.0027         | J 0.0027 | J | 0   | 30     |
| 335-67-1       | Perfluorooctanoic acid        | 0.0095         | 0.0094   |   | 1   | 30     |
| 375-95-1       | Perfluorononanoic acid        | ND             | ND       |   | nc  | 30     |
| 335-76-2       | Perfluorodecanoic acid        | ND             | ND       |   | nc  | 30     |
| 2058-94-8      | Perfluoroundecanoic acid      | ND             | ND       |   | nc  | 30     |
| 307-55-1       | Perfluorododecanoic acid      | ND             | ND       |   | nc  | 30     |
| 72629-94-8     | Perfluorotridecanoic acid     | ND             | ND       |   | nc  | 30     |
| 376-06-7       | Perfluorotetradecanoic acid   | ND             | ND       |   | nc  | 30     |
| 375-73-5       | Perfluorobutanesulfonic acid  | 0.0025         | J 0.0026 | J | 4   | 30     |
| 2706-91-4      | Perfluoropentanesulfonic acid | ND             | ND       |   | nc  | 30     |
| 355-46-4       | Perfluorohexanesulfonic acid  | 0.0038         | J 0.0045 | J | 17  | 30     |
| 375-92-8       | Perfluoroheptanesulfonic acid | ND             | ND       |   | nc  | 30     |
| 1763-23-1      | Perfluorooctanesulfonic acid  | 0.0059         | J 0.0057 | J | 3   | 30     |
| 68259-12-1     | Perfluorononanesulfonic acid  | ND             | ND       |   | nc  | 30     |
| 335-77-3       | Perfluorodecanesulfonic acid  | ND             | ND       |   | nc  | 30     |
| 754-91-6       | PFOSA                         | ND             | ND       |   | nc  | 30     |
| 2355-31-9      | MeFOSAA                       | ND             | ND       |   | nc  | 30     |
| 2991-50-6      | EiFOSAA                       | ND             | ND       |   | nc  | 30     |
| 757124-72-44:2 | Fluorotelomer sulfonate       | ND             | ND       |   | nc  | 30     |
| 27619-97-2     | 6:2 Fluorotelomer sulfonate   | ND             | ND       |   | nc  | 30     |
| 39108-34-4     | 8:2 Fluorotelomer sulfonate   | ND             | ND       |   | nc  | 30     |
| 13252-13-6     | HFPO-DA (GenX)                | ND             | ND       |   | nc  | 30     |
| 919005-14-4    | ADONA                         | ND             | ND       |   | nc  | 30     |
| 756426-58-19   | Cl-PF3ONS (F-53B Major)       | ND             | ND       |   | nc  | 30     |
| 763051-92-91   | Cl-PF3OUdS (F-53B Minor)      | ND             | ND       |   | nc  | 30     |

| CAS No. | ID Standard Recoveries | DUP | FA77413-11 | Limits  |
|---------|------------------------|-----|------------|---------|
|         | 13C4-PFBA              | 87% | 83%        | 35-135% |
|         | 13C5-PFPeA             | 83% | 81%        | 50-150% |
|         | 13C5-PFHxA             | 85% | 84%        | 50-150% |
|         | 13C4-PFHpA             | 87% | 81%        | 50-150% |

\* = Outside of Control Limits.

# Duplicate Summary

Job Number: FA77230  
 Account: ARCMIL Arcadis  
 Project: Racer Lansing PFAS Delineation; Lansing, MI

| Sample      | File ID   | DF | Analyzed | By  | Prep Date | Prep Batch | Analytical Batch |
|-------------|-----------|----|----------|-----|-----------|------------|------------------|
| OP81449-DUP | 2Q52554.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |
| FA77413-11  | 2Q52553.D | 1  | 08/09/20 | NAF | 08/07/20  | OP81449    | S2Q781           |

The QC reported here applies to the following samples:

Method: EPA 537M BY ID

FA77230-17

| CAS No. | ID Standard Recoveries | DUP  | FA77413-11 | Limits  |
|---------|------------------------|------|------------|---------|
|         | 13C8-PFOA              | 90%  | 86%        | 50-150% |
|         | 13C9-PFNA              | 84%  | 83%        | 50-150% |
|         | 13C6-PFDA              | 85%  | 86%        | 50-150% |
|         | 13C7-PFUnDA            | 85%  | 84%        | 40-140% |
|         | 13C2-PFDoDA            | 82%  | 78%        | 40-140% |
|         | 13C2-PFTeDA            | 74%  | 70%        | 30-130% |
|         | 13C3-PFBS              | 92%  | 89%        | 50-150% |
|         | 13C3-PFHxS             | 108% | 101%       | 50-150% |
|         | 13C8-PFOS              | 94%  | 94%        | 50-150% |
|         | 13C8-FOSA              | 86%  | 86%        | 30-130% |
|         | d3-MeFOSAA             | 66%  | 62%        | 50-150% |
|         | 13C2-4:2FTS            | 78%  | 77%        | 50-150% |
|         | 13C2-6:2FTS            | 80%  | 78%        | 50-150% |
|         | 13C2-8:2FTS            | 78%  | 78%        | 50-150% |
|         | 13C3-HFPO-DA           | 99%  |            | 50-150% |

\* = Outside of Control Limits.

# ATTACHMENT 2

Soil Boring Logs



# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/14/2020 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 07/19/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 80° F, Sunny


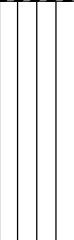


| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                 | PID (ppm)  | USCS Class  | Description | Construction Details  | Well |
|--------------|-----------------|-------------|----------------|---------------------------|--|---|-------------|---|------|
| 1            |                 |             |                | SB-P2-OM185_0.6-1 @ 14:15 | 0.1  | (0.0-0.6') CONCRETE.  |             | (0.0-36.0')<br>10.0" dia. drilled hole with 8.0" dia. Permanent Steel Casing cemented in-place with Neat Cement Grout (Portland Cement) |      |
| 2            |                 |             | 0.1            |                           | (0.6-1.0') SAND, fine to medium; trace granules, subrounded; trace pebbles, small to medium, subrounded; little silt; poorly sorted; dry; brown (10YR 5/3).<br>Note: Fill material.  |   |             |   |      |
| 3            |                 | 60          |                | 0.0                       | (1.0-2.5') CLAY, low to medium plasticity, no dilatancy; some silt; little sand, fine to medium; trace granules, subrounded; trace pebbles, small to large, subrounded; dry; stiff; light brownish gray (10YR 6/2).<br>Note: Fill material. Trace brick fragments present. |   |             |   |      |
| 4            |                 |             |                | 0.0                       | (2.5-4.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, fine; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; medium stiff to stiff; grayish brown (10YR 5/2).   |   |             |   |      |
| 5            |                 |             |                | 0.0                       | (4.0-8.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, fine; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; stiff; brown (10YR 5/3).  |   |             |   |      |
| 6            |                 |             | 60             | SB-P2-OM185_9-9.5 @ 14:20 | 0.0  | (8.5-9.5') SILT, nonplastic, rapid dilatancy; and SAND, very fine; trace clay; well sorted; wet; grayish brown (10YR 5/2).  |             |   |      |
| 7            |                 |             |                |                           | 0.0  | (9.5-27.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded; trace pebbles, small to very large, subrounded; moist; medium stiff; grayish brown (10YR 5/2). |             |   |      |
| 8            |                 |             |                | 0.0                       |  |   |             |   |      |
| 9            |                 |             |                | 0.0                       |  |   |             |   |      |
| 10           |                 |             |                | 0.0                       |  |   |             |   |      |
| 11           |                 |             |                | 0.0                       |  |   |             |   |      |
| 12           |                 |             |                | 0.0                       |  |   |             |   |      |
| 13           |                 |             |                | 0.0                       |  |   |             |   |      |
| 14           |                 |             |                | 0.0                       |  |   |             |   |      |
| 15           |                 | 96          |                | 0.0                       |  |   |             |   |      |
| 16           |                 |             |                | 0.0                       |  |   |             |   |      |
| 17           |                 |             |                | 0.0                       |  |   |             |   |      |
| 18           |                 |             |                | 0.0                       |  |   |             |   |      |
| 19           |                 |             |                | 0.0                       |  |   |             |   |      |
| 20           |                 |             |                | 0.0                       |  |   |             |   |      |
| 21           |                 |             |                | 0.0                       |  |   |             |   |      |
| 22           |                 |             |                | 0.0                       |  |   |             |   |      |
| 23           |                 |             |                | 0.0                       |  |   |             |   |      |
| 24           |                 |             |                | 0.0                       |  |   |             |   |      |
| 25           |                 |             |                | 0.0                       |  |   |             |   |      |

Drilling Co.: Traut Drilling Sampling Method: Core Barrel  
 Driller: Dan Karasch Sampling Interval: Continuous  
 Drilling Method: Sonic Drilling Water Level Start (ft. bgs.): NA  
 Drilling Fluid: Water Water Level Finish (ft. btoc.): NA  
 Remarks: bgs = below ground surface. Converted to Well:  Yes  No  
 Surface Elev.: 862.2  
 North Coor.: 450938.8  
 East Coor.: 13065381.6

SOIL BORING LOG: 2013 \ARCADIS-US\COMMON\MONITORING\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_102220.GPJ ARCADIS 2013 GDT 10/22/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/14/2020 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 07/19/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 80° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                   | PID (ppm) | USCS Class   | Description   | Construction Details                  | Well |
|--------------|-----------------|-------------|----------------|-----------------------------|-----------|--|---|---------------------------------------|------|
| 26           |                 |             | 120            |                             | 0.0       |   | (9.5-27.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded; trace pebbles, small to very large, subrounded; moist; medium stiff; grayish brown (10YR 5/2).<br>Note: Very fine, wet sand lenses present at 25.0' bgs and 25.5' bgs. |                                       |      |
| 27           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 28           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 29           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 30           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 31           |                 |             |                | SB-P2-OM185_31-31.5 @ 14:30 | 0.0       |   | (27.0-31.5') SILT, nonplastic, rapid dilatancy; some sand, very fine; well sorted; wet; grayish brown (10YR 5/2).   | (0.0-63.0')<br>2.0" dia. PVC casing   |      |
| 32           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 33           |                 | 72          |                | 0.0                         |           |  |   |                                       |      |
| 34           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 35           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 36           |                 |             |                |                             | 0.0       |   | (31.5-36.0') CLAY, high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; trace cobbles, small, subrounded; moist; stiff to very stiff; gray (10YR 5/1).                                   |                                       |      |
| 37           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 38           |                 | 48          |                | 0.0                         |           |  |   |                                       |      |
| 39           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 40           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 41           |                 |             |                | SB-P2-OM185_41-41.5 @ 14:15 | 0.0       |  | (36.0-52.0') CLAY, medium to high plasticity, no dilatancy; some silt; trace sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; moist; very stiff; gray (10YR 5/1).  | (36.0-59.0')<br>Bentonite Quick Grout |      |
| 42           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 43           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 44           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 45           |                 | 120         |                | 0.0                         |           |  |   |                                       |      |
| 46           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 47           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 48           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 49           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 50           |                 |             |                | 0.0                         |           |  |   |                                       |      |
| 51           |                 | 120         |                | 0.0                         |           |  |   |                                       |      |

Remarks:

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SOIL BORING LOG: 2013 \\ARCADIS-US-CO\OFFICE\DATA\NOV\1\MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_102220.GPJ ARCADIS\_2013.GDT 10/22/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/14/2020 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 07/19/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 80° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                   | PID (ppm) | USCS Class | Description   | Construction Details   | Well |
|--------------|-----------------|-------------|----------------|-----------------------------|-----------|------------|---|--|------|
| 53           |                 |             |                | SB-P2-OM185_52-52.5 @ 14:35 | 0.0       | SP         | (52.0-54.0') SAND, fine to very coarse, subrounded to subangular; little granules, subrounded; little pebbles, small to large, subrounded; little silt; poorly sorted; dry; grayish brown (10YR 5/2).   |  |      |
| 54           |                 |             |                |                             | 0.0       |            | (54.0-60.0') SILT, nonplastic to low plasticity, no dilatancy; little clay; little sand, very fine to fine, subrounded; trace granules, subrounded; trace pebbles, small to large, subrounded; dry to moist; stiff; grayish brown (10YR 5/2). |  |      |
| 55           |                 |             | 120            |                             | 0.0       |            |   | (59.0-60.0') Bentonite Time-Release Coated Pellets<br>(60.0-61.0') Fine Choker Sand<br>(61.0-70.0') Filter Pack Sand<br><br>(63.0-68.0') 2.0" dia. Stainless-Steel 0.010-Slot Screen |      |
| 56           |                 |             |                | SB-P2-OM185_59.5-60 @ 14:55 | 0.0       |            |   |  |      |
| 57           |                 |             |                |                             | 0.0       |            |   |  |      |
| 58           |                 |             |                |                             | 0.0       |            |   |  |      |
| 59           |                 |             |                |                             | 0.0       |            |   |  |      |
| 60           |                 |             |                |                             | 0.0       |            |   |  |      |
| 61           |                 |             |                |                             | 0.0       | SW         | (60.0-68.0') WEATHERED SANDSTONE, very fine; well sorted; light gray (10YR 7/1). Note: Many brittle fragments in a mostly soft sand matrix. Heavily weathered. No competency.   |  |      |
| 62           |                 |             |                |                             | 0.0       |            |   |  |      |
| 63           |                 |             |                |                             | 0.0       |            |   |  |      |
| 64           |                 |             |                |                             | 0.0       |            |   |  |      |
| 65           |                 |             | 120            |                             | 0.0       |            |   |  |      |
| 66           |                 |             |                |                             | 0.0       |            |   |  |      |
| 67           |                 |             |                |                             | 0.0       |            |   |  |      |
| 68           |                 |             |                |                             | 0.0       |            |   |  |      |
| 69           |                 |             |                |                             | 0.0       | SM         | (68.0-69.5') SHALE; black (10YR 2/1).   |  |      |
| 70           |                 |             |                |                             | 0.0       |            |   | (69.5-70.0') SANDSTONE, very fine; well sorted; light gray (10YR 7/1).<br>End of boring at 70.0' bgs.  |      |
| 71           |                 |             |                |                             |           |            |   |  |      |
| 72           |                 |             |                |                             |           |            |   |  |      |
| 73           |                 |             |                |                             |           |            |   |  |      |
| 74           |                 |             |                |                             |           |            |   |  |      |
| 75           |                 |             |                |                             |           |            |   |  |      |
| 76           |                 |             |                |                             |           |            |   |  |      |
| 77           |                 |             |                |                             |           |            |   |  |      |
| 78           |                 |             |                |                             |           |            |   |  |      |

Remarks:

SOIL BORING LOG - 2013 \ARCADIS\US\COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_102220.GPJ ARCADIS\_2013.GDT 10/22/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/14/2020 Logger: A. Westhuis  
 Project Number: 30042872 Date Completed: 07/19/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 80° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID | PID (ppm) | USCS Class | Description | Construction Details | Well |
|--------------|-----------------|-------------|----------------|-----------|-----------|------------|-------------|----------------------|------|
| 79           |                 |             |                |           |           |            |             |                      |      |
| 80           |                 |             |                |           |           |            |             |                      |      |
| 81           |                 |             |                |           |           |            |             |                      |      |
| 82           |                 |             |                |           |           |            |             |                      |      |
| 83           |                 |             |                |           |           |            |             |                      |      |
| 84           |                 |             |                |           |           |            |             |                      |      |
| 85           |                 |             |                |           |           |            |             |                      |      |
| 86           |                 |             |                |           |           |            |             |                      |      |
| 87           |                 |             |                |           |           |            |             |                      |      |
| 88           |                 |             |                |           |           |            |             |                      |      |
| 89           |                 |             |                |           |           |            |             |                      |      |
| 90           |                 |             |                |           |           |            |             |                      |      |
| 91           |                 |             |                |           |           |            |             |                      |      |
| 92           |                 |             |                |           |           |            |             |                      |      |
| 93           |                 |             |                |           |           |            |             |                      |      |
| 94           |                 |             |                |           |           |            |             |                      |      |
| 95           |                 |             |                |           |           |            |             |                      |      |
| 96           |                 |             |                |           |           |            |             |                      |      |
| 97           |                 |             |                |           |           |            |             |                      |      |
| 98           |                 |             |                |           |           |            |             |                      |      |
| 99           |                 |             |                |           |           |            |             |                      |      |
| 100          |                 |             |                |           |           |            |             |                      |      |
| 101          |                 |             |                |           |           |            |             |                      |      |
| 102          |                 |             |                |           |           |            |             |                      |      |
| 103          |                 |             |                |           |           |            |             |                      |      |
| 104          |                 |             |                |           |           |            |             |                      |      |
| 105          |                 |             |                |           |           |            |             |                      |      |

Remarks: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

SOIL BORING LOG: 2013 \ARCADIS-US-CO\OFFICE\DATA\NOV\COMMON\RCER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING\MASTER.DAT\BASE\_102220.GPJ ARCADIS\_2013.GDT 10/22/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/21/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/21/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 72° F, Cloudy

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                       | PID (ppm) | USCS Class | Description   | Construction Details                   | Well |
|--------------|-----------------|-------------|----------------|---------------------------------|-----------|------------|---|--|------|
| 0            |                 |             |                |                                 | 0.0       |            | (0.0-0.4') ASPHALT.   |  |      |
| 1            |                 |             |                |                                 | 0.0       |            | (0.4-2.5') SAND, very fine to medium; trace silt; trace gravel; trace granules; trace pebbles, small to large, subrounded to subangular; poorly sorted; moist; dark yellowish brown (10YR 4/4). |  |      |
| 2            |                 |             | 60             |                                 | 0.0       |            |   |  |      |
| 3            |                 |             |                |                                 | 0.0       |            | (2.5-7.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; soft; moist; gray (10YR 5/1) and brownish yellow (10YR 6/6).  |  |      |
| 4            |                 |             |                |                                 | 0.0       |            |   |  |      |
| 5            |                 |             |                |                                 | 0.0       |            |   |  |      |
| 6            |                 |             |                |                                 | 0.0       |            |   |  |      |
| 7            |                 |             |                | VAP-OS-MB263_5-10               | 0.0       |            |   |  |      |
| 8            |                 |             | 54             | and MS/MSD @ 13:37 on 7/21/2020 | 0.0       |            | (7.0-8.0') SAND, very fine to fine; some silt; trace granules, subrounded to subangular; trace clay; well sorted; wet; yellowish brown (10YR 5/4).  |  |      |
| 9            |                 |             |                |                                 | 0.0       |            | (8.0-14.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace pebbles, very large, subrounded to subangular; soft; moist to wet; dark gray (10YR 4/1).     |  |      |
| 10           |                 |             |                |                                 | 0.0       |            |   | (0.0-20.0') Backfilled with bentonite. |      |
| 11           |                 |             |                |                                 | 0.0       |            |   |  |      |
| 12           |                 |             |                |                                 | 0.0       |            |   |  |      |
| 13           |                 |             | 52             |                                 | 0.0       |            |   |  |      |
| 14           |                 |             |                |                                 | 0.0       |            |   |  |      |
| 15           |                 |             |                |                                 | 0.0       |            | (14.0-17.0') SILT, nonplastic, rapid dilatancy; little sand, very fine to fine; trace clay; wet; gray (10YR 5/1).   |  |      |
| 16           |                 |             |                |                                 | 0.0       |            |   |  |      |
| 17           |                 |             |                |                                 | 0.0       |            |   |  |      |
| 18           |                 |             | 43             |                                 | 0.0       |            | (17.0-20.0') CLAY, medium to high plasticity, no dilatancy; some silt; little sand, very fine to fine; soft; wet; gray (10YR 5/1).  |  |      |
| 19           |                 |             |                |                                 | 0.0       |            |   |  |      |
| 20           |                 |             |                |                                 | 0.0       |            | End of boring at 20.0' bgs.   |  |      |

Drilling Co.: Stock Drilling Sampling Method: Dual Tube  
 Driller: Jesse Stromberger Sampling Interval: Continuous  
 Drilling Method: Hand Auger / Direct Push Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: Temporary well screen set from 5.0-10.0' bgs. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG: 2013 VARCADIS-US-COM-OFFICE-DATA\NOV-11-MICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_091520.GPJ ARCADIS 2013.GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/22/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/22/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 74° F, Cloudy

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                                    | PID (ppm) | USCS Class | Description   | Construction Details                      | Well |
|--------------|-----------------|-------------|----------------|--|-----------|------------|---|---|------|
| 1            |                 |             |                |  | NA        |            | (0.0-1.5') CONCRETE.  |   |      |
| 2            |                 |             | 32             |  | 0.0       |            | (1.5-2.0') SAND, very fine to medium; trace pebbles, very large, subrounded; trace silt; poorly sorted; moist; dark yellowish brown (10YR 3/6).   |   |      |
| 3            |                 |             |                |  | 0.0       |            | (2.0-6.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, very fine to fine; stiff; dry to moist; grayish brown (10YR 5/2) and yellowish brown (10YR 5/6).   |   |      |
| 4            |                 |             |                |  | 0.0       |            |   |   |      |
| 5            |                 |             |                |  | 0.0       |            |   |   |      |
| 6            |                 |             |                |  | 0.0       |            |   |   |      |
| 7            |                 |             | 45             | VAP-P2-NV170_6-11<br>@ 08:28 on<br>7/23/2020 | 0.0       |            | (6.0-10.0') SAND, very fine to medium; and CLAY, medium plasticity, no dilatancy; some sand, coarse, subrounded to angular; some pebbles, very large, subrounded to angular; little silt; poorly sorted; soft to medium stiff; wet; yellowish brown (10YR 5/4). | (0.0-40.0')<br>Backfilled with bentonite. |      |
| 8            |                 |             |                |  | 0.0       |            |   |   |      |
| 9            |                 |             |                |  | 0.0       |            |   |   |      |
| 10           |                 |             |                |  | 0.0       |            |   |   |      |
| 11           |                 |             |                |  | 0.0       |            | (10.0-10.5') SAND, very fine to coarse; some sand, very coarse, subrounded to angular; some pebbles, small, subrounded to angular; little silt; poorly sorted; wet; dark grayish brown (10YR 4/2).  |   |      |
| 12           |                 |             | 54             |  | 0.0       |            | (10.5-13.5') CLAY, high plasticity, no dilatancy; little sand, very fine to fine; little silt; trace sand, very coarse, subrounded to angular; trace granules, subround to angular; soft; moist to wet; dark gray (10YR 4/1).                                   |   |      |
| 13           |                 |             |                |  | 0.0       |            |   |   |      |
| 14           |                 |             |                |  | 0.0       |            |   |   |      |
| 15           |                 |             |                |  | 0.0       |            | (13.5-20.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; stiff; moist; dark gray (10YR 4/1).   |   |      |
| 16           |                 |             |                |  | 0.0       |            |   |   |      |
| 17           |                 |             |                |  | 0.0       |            |   |   |      |
| 18           |                 |             | 60             |  | 0.0       |            |   |   |      |
| 19           |                 |             |                |  | 0.0       |            |   |   |      |
| 20           |                 |             |                |  | 0.0       |            |   |   |      |

Drilling Co.: Stock Drilling Sampling Method: Dual Tube  
 Driller: Jesse Stromberger Sampling Interval: Continuous  
 Drilling Method: Geoprobe Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: Temporary well screen set from 6.0-11.0' bgs and 18.5-23.5' bgs. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG - 2013 VARCADIS-US-COM-OFFICE-DATA-NV-170-BORING-LOGS-RACER-LANSING-MASTER-DATABASE\_091520.GPJ ARCADIS 2013.GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/22/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/22/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 74° F, Cloudy

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                                   | PID (ppm)                   | USCS Class   | Description  | Construction Details                   | Well |
|--------------|-----------------|-------------|----------------|---|-----------------------------|--|--|--|------|
| 21           |                 |             |                | VAP-P2-NV170_18.5-23.5 @ 08:36 on 7/23/2020 | 0.0                         |  | (20.0-22.0') SAND, very fine to medium; trace sand, very coarse, subrounded to subangular; trace granules, subrounded to subangular; trace silt; well sorted; moist to wet; grayish brown (10YR 5/2).  | (0.0-40.0') Backfilled with bentonite. |      |
| 22           |                 |             | 0.0            |   |                             |  |  |  |      |
| 23           |                 |             | 60             | 0.0   |                             | (22.0-27.0') CLAY, high plasticity, no dilatancy; little silt; little sand, very fine to fine; trace granules, subrounded to subangular; trace pebbles, large, subrounded to subangular; medium stiff to stiff; moist; dark gray (10YR 4/1). |  |  |      |
| 24           |                 |             | 0.0            |   |                             |  |  |  |      |
| 25           |                 |             | 0.0            |   |                             |  |  |  |      |
| 26           |                 |             |                |   | 0.0                         |  | (27.0-28.5') SILT, nonplastic, rapid dilatancy; little sand, very fine to fine; trace clay; moist; dark grayish brown (10YR 4/2).  |  |      |
| 27           |                 |             | 60             | 0.0   |                             |  |  |  |      |
| 28           |                 |             | 0.0            |   |                             |  |  |  |      |
| 29           |                 |             |                |   | 0.0                         |  | (28.5-32.0') CLAY, medium plasticity, slow dilatancy; some silt; little sand, very fine to fine; moist to wet; very soft; dark gray (10YR 4/1).  |  |      |
| 30           |                 |             | 0.0            |   |                             |  |  |  |      |
| 31           |                 |             |                |   | 0.0                         |  | (32.0-35.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; soft to medium stiff; moist to wet; dark gray (10YR 4/1).  |  |      |
| 32           |                 |             | 60             | 0.0   |                             |  |  |  |      |
| 33           |                 |             | 0.0            |   |                             |  |  |  |      |
| 34           |                 |             |                |   | 0.0                         |  | (35.0-40.0') CLAY, medium to high plasticity, no dilatancy; little silt; little sand, very fine to fine; trace granules, subrounded to subangular; trace pebbles, medium, subrounded to subangular; very stiff; moist; dark gray (10YR 4/1). |  |      |
| 35           |                 |             | 0.0            |   |                             |  |  |  |      |
| 36           |                 |             |                | NR  |                             |  |  |  |      |
| 37           |                 |             |                | NR  |                             |  |  |  |      |
| 38           |                 |             |                | NR  |                             |  |  |  |      |
| 39           |                 |             |                | NR  |                             |  |  |  |      |
| 40           |                 |             |                | NR  | End of boring at 40.0' bgs. |  |  |  |      |
| 41           |                 |             |                |   |                             |  |  |  |      |

Remarks:

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/22/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/22/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 82° F, Cloudy

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                             | PID (ppm) | USCS Class | Description   | Construction Details                   | Well |
|--------------|-----------------|-------------|----------------|---------------------------------------|-----------|------------|---|--|------|
| 1            |                 |             |                |                                       | NR        |            | (0.0-1.5') CONCRETE.  | (0.0-40.0') Backfilled with bentonite. |      |
| 2            |                 |             | 26             |                                       | 0.0       |            | (1.5-9.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, very fine to fine; stiff; dry to moist; gray (10YR 6/1) and yellowish brown (10YR 5/6).  |  |      |
| 3            |                 |             |                |                                       | 0.0       |            |   |  |      |
| 4            |                 |             |                |                                       | 0.0       |            |   |  |      |
| 5            |                 |             |                |                                       | 0.0       |            |   |  |      |
| 6            |                 |             |                |                                       | 0.0       |            |   |  |      |
| 7            |                 |             |                |                                       | 0.0       |            |   |  |      |
| 8            |                 |             | 60             |                                       | 0.0       |            |   |  |      |
| 9            |                 |             |                |                                       | 0.0       |            |   |  |      |
| 10           |                 |             |                |                                       | 0.0       |            | (9.0-13.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace sand, very coarse, subrounded to subangular; trace granules, subrounded to subangular; stiff; moist; brown (10YR 5/3).   |  |      |
| 11           |                 |             |                |                                       | 0.0       |            | Note: Boring appeared wet at 11.0' bgs.   |  |      |
| 12           |                 |             |                |                                       | 0.0       |            |   |  |      |
| 13           |                 |             | 60             | VAP-P2-OP164_10-15 @ 13:53 on 7/24/20 | 0.0       |            |   |  |      |
| 14           |                 |             |                |                                       | 0.0       |            | (13.0-17.5') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace sand, very coarse, subrounded to subangular; trace pebbles, small, subrounded to subangular; soft to medium stiff; moist to wet; dark grayish brown (10YR 4/2).       |  |      |
| 15           |                 |             |                |                                       | 0.0       |            |   |  |      |
| 16           |                 |             |                |                                       | 0.0       |            |   |  |      |
| 17           |                 |             |                |                                       | 0.0       |            |   |  |      |
| 18           |                 |             | 60             |                                       | 0.0       |            | (17.5-18.5') SAND, very fine to fine; and CLAY, medium plasticity, slow dilatancy; some silt; trace sand, coarse to very coarse, subrounded to subangular; trace pebbles, small to large, subrounded to subangular; poorly sorted; medium stiff; moist; brown (10YR 5/3). |  |      |
| 19           |                 |             |                |                                       | 0.0       |            | (18.5-33.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded; soft; moist to wet; dark gray (10YR 4/1).   |  |      |
| 20           |                 |             |                |                                       | 0.0       |            |   |  |      |

Drilling Co.: Stock Drilling Sampling Method: Dual Tube  
 Driller: Jesse Stromberger Sampling Interval: Continuous  
 Drilling Method: Geoprobe Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: Temporary well screen set from 10.0-15.0' bgs and 27.0-32.0' bgs. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_081520.GPJ ARCADIS\_2013.GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/22/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/22/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 82° F, Cloudy

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID | PID (ppm) | USCS Class                             | Description   | Construction Details | Well |
|--------------|-----------------|-------------|----------------|-----------|-----------|--|---|----------------------|------|
| 21           |                 |             |                |           | 0.0       |  | (18.5-33.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded; soft; moist to wet; dark gray (10YR 4/1). |                      |      |
| 22           |                 |             |                | 0.0       |           |  |   |                      |      |
| 23           |                 |             | 60             | 0.0       |           |  |   |                      |      |
| 24           |                 |             |                | 0.0       |           |  |   |                      |      |
| 25           |                 |             |                | 0.0       |           |  |   |                      |      |
| 26           |                 |             |                | 0.0       |           |  |   |                      |      |
| 27           |                 |             |                | 0.0       |           |  |   |                      |      |
| 28           |                 |             | 60             | 0.0       |           |  |   |                      |      |
| 29           |                 |             |                | 0.0       |           |  |   |                      |      |
| 30           |                 |             |                | 0.0       |           |  |   |                      |      |
| 31           |                 |             |                | 0.0       |           | (0.0-40.0') Backfilled with bentonite. |   |                      |      |
| 32           |                 |             |                | 0.0       |           |  |   |                      |      |
| 33           |                 |             | 60             | 0.0       |           |  |   |                      |      |
| 34           |                 |             |                | 0.0       |           |  |   |                      |      |
| 35           |                 |             |                | 0.0       |           |  |   |                      |      |
| 36           |                 |             |                | 0.0       |           |  |   |                      |      |
| 37           |                 |             |                | 0.0       |           |  |   |                      |      |
| 38           |                 |             | 60             | 0.0       |           |  |   |                      |      |
| 39           |                 |             |                | 0.0       |           |  |   |                      |      |
| 40           |                 |             |                | 0.0       |           |  |   |                      |      |
| 41           |                 |             |                |           |           |  |   |                      |      |

VAP-P2-OP164\_27-32  
@ 14:10 on 7/24/20

Note: Boring appeared wet at 28.5' bgs.

End of boring at 40.0' bgs.

Remarks:

SOIL BORING LOG: 2013 \ARCADIS-US-COM\OFFICE\DATA\WORKING\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_091520.GPJ ARCADIS\_2013.GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/23/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/23/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 79° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID | PID (ppm)   | USCS Class   | Description         | Construction Details                   | Well        |
|--------------|-----------------|-------------|----------------|-----------|---|--|---------------------|--|-------------|
| 1            |                 |             |                |           | 0.0   | [Diagonal Hatching]  | (0.0-0.3') ASPHALT. | (0.0-40.0') Backfilled with bentonite. | [Black Box] |
| 2            |                 |             |                | 0.0       | (0.3-8.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; medium stiff; dry to moist; yellowish brown (10YR 5/4). |  |                     |  |             |
| 3            |                 | 53          |                | 0.0       |   |  |                     |  |             |
| 4            |                 |             |                | 0.0       |   |  |                     |  |             |
| 5            |                 |             |                | 0.0       |   |  |                     |  |             |
| 6            |                 |             |                | 0.0       | [Diagonal Hatching]   | (8.0-23.0') CLAY, medium to high plasticity, slow dilatancy; some sand, very fine to fine; little silt; trace sand, very coarse, subrounded to subangular; trace pebbles, small to large, subrounded to subangular; moist to wet; very soft; yellowish brown (10YR 5/4). |                     |  |             |
| 7            |                 |             |                | 0.0       |   |  |                     |  |             |
| 8            |                 | 60          |                | 0.0       |   |  |                     |  |             |
| 9            |                 |             |                | 0.0       |   |  |                     |  |             |
| 10           |                 |             |                | 0.0       |   |  |                     |  |             |
| 11           |                 |             |                | 0.0       | [Diagonal Hatching]   | Note: Boring appeared wet at 11.0' bgs.  |                     |  |             |
| 12           |                 |             |                | 0.0       |   |  |                     |  |             |
| 13           |                 | 60          |                | 0.0       |   |  |                     |  |             |
| 14           |                 |             |                | 0.0       |   |  |                     |  |             |
| 15           |                 |             |                | 0.0       |   |  |                     |  |             |
| 16           |                 |             |                | 0.0       | [Diagonal Hatching]   | Note: Color change to dark gray (10YR 4/1) at 14.0' bgs.   |                     |  |             |
| 17           |                 |             |                | 0.0       |   |  |                     |  |             |
| 18           |                 | 57          |                | 0.0       |   |  |                     |  |             |
| 19           |                 |             |                | 0.0       |   |  |                     |  |             |
| 20           |                 |             |                | 0.0       |   |  |                     |  |             |

Drilling Co.: Stock Drilling Sampling Method: Dual Tube  
 Driller: Jesse Stromberger Sampling Interval: Continuous  
 Drilling Method: Geoprobe Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: Temporary well screen set from 19.0-24.0' bgs and 30.0-35.0' bgs. No sample collected at from 30.0-35.0' bgs due to well running dry. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COM\OFFICE\DATA\ANNOV\HICOMMON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_091520.GPJ ARCADIS 2013 GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/23/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/23/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 79° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                                | PID (ppm) | USCS Class | Description  | Construction Details                      | Well |
|--------------|-----------------|-------------|----------------|--|-----------|------------|--|---|------|
| 21           | X               |             | 60             | VAP-P2-PP185_19-24<br>@ 14:45 on 7/24/20 | 0.0       |            | (8.0-23.0') CLAY, medium to high plasticity, slow dilatancy; some sand, very fine to fine; little silt; trace sand, very coarse, subrounded to subangular; trace pebbles, small to large, subrounded to subangular; moist to wet; very soft; yellowish brown (10YR 5/4). |   |      |
| 22           |                 |             |                |  | 0.0       |            |  |   |      |
| 23           |                 |             |                |  | 0.0       |            |  |   |      |
| 24           |                 |             |                |  | 0.0       |            |  |   |      |
| 25           | X               |             | 60             |  | 0.0       |            | (23.0-23.4') CLAY, medium to high plasticity, slow dilatancy; and SAND, very fine to fine; little silt; trace sand, very coarse, subrounded to subangular; trace granules, subrounded to subangular; very soft; well sorted; wet; dark grayish brown (10YR 4/2).         | (0.0-40.0')<br>Backfilled with bentonite. |      |
| 26           |                 |             |                |  | 0.0       |            |  |   |      |
| 27           |                 |             |                |  | 0.0       |            |  |   |      |
| 28           |                 |             |                |  | 0.0       |            |  |   |      |
| 29           |                 |             |                |  | 0.0       |            |  |   |      |
| 30           |                 |             |                |  | 0.0       |            |  |   |      |
| 31           | X               |             | 36             |  | 0.0       |            | (30.0-32.0') SAND, very fine to fine; little silt; trace clay; well sorted; moist; grayish brown (10YR 5/2).   |   |      |
| 32           |                 |             |                |  | 0.0       |            |  |   |      |
| 33           |                 |             |                |  | 0.0       |            |  |   |      |
| 34           |                 |             |                |  | 0.0       |            |  |   |      |
| 35           | X               |             | 60             |  | 0.0       |            | (32.0-35.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; stiff; moist; dark grayish brown (10YR 4/2).   |   |      |
| 36           |                 |             |                |  | 0.0       |            |  |   |      |
| 37           |                 |             |                |  | 0.0       |            |  |   |      |
| 38           |                 |             |                |  | 0.0       |            |  |   |      |
| 39           | X               |             |                |  | 0.0       |            | (35.0-38.0') CLAY, medium to high plasticity, no dilatancy; some silt; little sand, very fine to fine; trace sand, very coarse, subrounded to subangular; trace granules, subrounded to subangular; soft; wet; dark grayish brown (10YR 4/2).                            |   |      |
| 40           |                 |             |                |  | 0.0       |            |  |   |      |
| 41           |                 |             |                |  |           |            | (38.0-40.0') SAND, very fine to fine; and SILT, nonplastic, rapid dilatancy; trace clay; well sorted; wet; dark grayish brown (10YR 4/2).  |   |      |
|              |                 |             |                |  |           |            | End of boring at 40.0' bgs.  |   |      |

Remarks:

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/20/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/20/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 81° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                              | PID (ppm) | USCS Class   | Description  | Construction Details                      | Well |
|--------------|-----------------|-------------|----------------|--|-----------|--|--|---|------|
| 1            |                 |             |                | VAP-P6-OL211_1-6 @<br>14:13 on 7/23/20 | 0.0       |  | (0.0-0.5') SAND, very fine to fine, subrounded; little granules, subrounded to subangular; little pebbles, small to medium, subrounded to subangular; trace silt; poorly sorted, dry to moist; yellowish brown (10YR 5/4). | (0.0-40.0')<br>Backfilled with bentonite. |      |
| 2            |                 |             | 0.0            |  |           | (0.5-1.0') CLAY, medium plasticity, slow dilatancy; some sand, very fine to fine; little silt; trace granules, subrounded to subangular; soft; poorly sorted; brown (10YR 4/3).  |  |   |      |
| 3            |                 | 32          |                |  | 0.0       |  | (1.0-6.0') SAND, very fine to fine, subrounded; trace sand, very coarse sand, subrounded to subangular; trace granules, subrounded to subangular; trace silt; poorly sorted; wet; yellowish brown (10YR 5/4).              |   |      |
| 4            |                 |             |                |  | 0.0       |  |  |   |      |
| 5            |                 |             |                |  | 0.0       |  |  |   |      |
| 6            |                 |             |                | 0.0                                    |           | (6.0-10.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; moist; soft to medium stiff; dark grayish brown (10YR 4/2).   |  |   |      |
| 7            |                 |             | 45             |  | 0.0       |  |  |   |      |
| 8            |                 |             |                | 0.0                                    |           |  |  |   |      |
| 9            |                 |             |                | 0.0                                    |           |  |  |   |      |
| 10           |                 |             |                | 0.0                                    |           |  |  |   |      |
| 11           |                 |             |                | 0.0                                    |           | (10.0-17.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded to subangular; trace pebbles, small, subrounded to subangular; medium stiff; moist; brown (10YR 5/3). |  |   |      |
| 12           |                 |             |                | 0.0                                    |           |  |  |   |      |
| 13           |                 | 60          |                | 0.0                                    |           |  |  |   |      |
| 14           |                 |             |                | 0.0                                    |           |  |  |   |      |
| 15           |                 |             |                | 0.0                                    |           |  |  |   |      |
| 16           |                 |             |                | 0.0                                    |           |  |  |   |      |
| 17           |                 |             |                | 0.0                                    |           |  |  |   |      |
| 18           |                 | 60          |                | 0.0                                    |           | (17.0-20.0') CLAY, medium plasticity, no dilatancy; little silt; trace sand, very fine to fine; soft; moist; dark grayish brown (10YR 4/2).  |  |   |      |
| 19           |                 |             |                | 0.0                                    |           |  |  |   |      |
| 20           |                 |             |                | 0.0                                    |           |  |  |   |      |

Drilling Co.: Stock Drilling Sampling Method: Dual Tube  
 Driller: Jesse Stromberger Sampling Interval: Continuous  
 Drilling Method: Geoprobe Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: Temporary well screen set from 1.0-6.0' bgs and 33.0-38.0' bgs. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coord.: \_\_\_\_\_  
 East Coord.: \_\_\_\_\_

SOIL BORING LOG: 2013 \ARCADIS\US\COMMON\MONITORING\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_091520.GPJ ARCADIS 2013 GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/20/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/20/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 81° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID                                     | PID (ppm) | USCS Class | Description   | Construction Details                   | Well |
|--------------|-----------------|-------------|----------------|---|-----------|------------|---|--|------|
| 21           |                 |             |                |   | 0.0       |            | (20.0-33.0') CLAY, medium to high plasticity, no dilatancy; little silt; trace sand, very fine to fine; stiff; moist; dark gray (10YR 4/1).                       |  |      |
| 22           |                 |             |                |   | 0.0       |            |   |  |      |
| 23           |                 |             | 60             |   | 0.0       |            |   |  |      |
| 24           |                 |             |                |   | 0.0       |            |   |  |      |
| 25           |                 |             |                |   | 0.0       |            |   |  |      |
| 26           |                 |             |                |   | 0.0       |            |   |  |      |
| 27           |                 |             |                |   | 0.0       |            |   |  |      |
| 28           |                 |             | 60             |   | 0.0       |            |   |  |      |
| 29           |                 |             |                |   | 0.0       |            |   |  |      |
| 30           |                 |             |                |   | 0.0       |            |   |  |      |
| 31           |                 |             |                |   | 0.0       |            | (33.0-39.0') SAND, very fine to fine; little silt; well sorted; moist; brown (10YR 5/3).  | (0.0-40.0') Backfilled with bentonite. |      |
| 32           |                 |             |                |   | 0.0       |            |   |  |      |
| 33           |                 |             | 60             |   | 0.0       |            |   |  |      |
| 34           |                 |             |                |   | 0.0       |            |   |  |      |
| 35           |                 |             |                |   | 0.0       |            |   |  |      |
| 36           |                 |             |                | VAP-P6-OL211_33-38<br>@ 14:45 on<br>7/23/2020 | 0.0       |            |   |  |      |
| 37           |                 |             |                |   | 0.0       |            |   |  |      |
| 38           |                 |             | 18.5           |   | 0.0       |            |   |  |      |
| 39           |                 |             |                |   | 0.0       |            |   |  |      |
| 40           |                 |             |                |   | 0.0       |            |   |  |      |
| 41           |                 |             |                |   |           |            | (39.0-40.0') CLAY, medium plasticity, no dilatancy; little silt; trace sand, very fine to fine; soft; moist; dark gray (10YR 4/1).<br>End of boring at 40.0' bgs. |  |      |

Remarks:

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SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\NOV\COMMON\MONI\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_091520.GPJ ARCADIS\_2013.GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/20/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/20/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 81° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID  | PID (ppm) | USCS Class       | Description   | Construction Details                   | Well |
|--------------|-----------------|-------------|----------------|--|-----------|------------------|---|--|------|
| 1            |                 |             |                |  | 0.0       | [Dotted Pattern] | (0.0-5.0') SAND, very fine to medium, subrounded to subangular; some sand, very coarse, subrounded to subangular; some pebbles, small to large, subrounded to subangular; poorly sorted; dry; brown (10YR 5/3) and white (10YR 8/1).            |  |      |
| 2            |                 |             |                | 0.0  |           |                  |   |  |      |
| 3            |                 | 39          |                | 0.0  |           |                  |   |  |      |
| 4            |                 |             |                | 0.0  |           |                  |   |  |      |
| 5            |                 |             |                | 0.0  |           |                  |   |  |      |
| 6            |                 |             |                | VAP-P6-PG211_4-9 and DUP-01 @ 15:43 on 7/20/2020 | 0.0       | [Dotted Pattern] | (5.0-6.0') GRANULES, subrounded to subangular; some sand, very fine to medium, subrounded to subangular; poorly sorted; wet; black (10YR 2/1).  | (0.0-40.0') Backfilled with bentonite. |      |
| 7            |                 |             |                | 48   | 0.0       | [Diagonal Lines] | (6.0-11.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded to subangular; trace pebbles, small to large, subrounded to subangular; stiff; moist; brown (10YR 5/3).                 |  |      |
| 8            |                 |             |                |  | 0.0       |                  |   |  |      |
| 9            |                 |             |                |  | 0.0       |                  |   |  |      |
| 10           |                 |             |                |  | 0.0       |                  |   |  |      |
| 11           |                 |             |                |  | 0.0       |                  |   |  |      |
| 12           |                 |             |                |  | 0.0       | [Diagonal Lines] | (11.0-16.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded to subangular; trace pebbles, small to medium, subrounded to subangular; very soft; moist; yellowish brown (10YR 5/4). |  |      |
| 13           |                 | 60          |                |  | 0.0       |                  |   |  |      |
| 14           |                 |             |                |  | 0.0       |                  |   |  |      |
| 15           |                 |             |                |  | 0.0       |                  |   |  |      |
| 16           |                 |             |                |  | 0.0       | [Diagonal Lines] | (16.0-30.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded to subangular; trace pebbles, small to medium, subrounded to subangular; soft to stiff; moist; dark gray (10YR 4/1).   |  |      |
| 17           |                 |             |                |  | 0.0       |                  |   |  |      |
| 18           |                 | 60          |                |  | 0.0       |                  |   |  |      |
| 19           |                 |             |                |  | 0.0       |                  |   |  |      |
| 20           |                 |             |                |  | 0.0       |                  |   |  |      |

Drilling Co.: Stock Drilling Sampling Method: Dual Tube  
 Driller: Jesse Stromberger Sampling Interval: Continuous  
 Drilling Method: Geoprobe Water Level Start (ft. bgs.): NA  
 Drilling Fluid: None Water Level Finish (ft. btoc.): NA  
 Remarks: Temporary well screen set from 4.0-9.0' bgs and 34.0-39.0' bgs. No sample collected at from 34.0-39.0' bgs due to well running dry. Converted to Well:  Yes  No  
 Surface Elev.: NA  
 North Coor.: \_\_\_\_\_  
 East Coor.: \_\_\_\_\_

SOIL BORING LOG - 2013 \ARCADIS\US\COM\OFFICE\DATA\ANALYSIS\BORING LOGS\RACER LANSING MASTER.DAT\BASE\_091520.GPJ ARCADIS 2013.GDT 9/15/20

# Soil Boring Log

Project Name: RACER Lansing Date Started: 07/20/2020 Logger: K. Donahue  
 Project Number: 30042872 Date Completed: 07/20/2020 Editor: C. Cisco  
 Project Location: Lansing, MI Weather Conditions: 81° F, Sunny

| Depth (feet) | Sample Interval | Blow Counts | Recovery (in.) | Sample ID | PID (ppm) | USCS Class | Description  | Construction Details                   | Well |
|--------------|-----------------|-------------|----------------|-----------|-----------|------------|--|--|------|
| 21           |                 |             |                |           | 0.0       |            | (16.0-30.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded to subangular; trace pebbles, small to medium, subrounded to subangular; soft to stiff; moist; dark gray (10YR 4/1).<br><br>Note: Clay consistency changes to stiff at 23.0' bgs. |  |      |
| 22           |                 |             |                | 0.0       |           |            |  |  |      |
| 23           |                 |             | 60             |           | 0.0       |            |  |  |      |
| 24           |                 |             |                |           | 0.0       |            |  |  |      |
| 25           |                 |             |                |           | 0.0       |            |  |  |      |
| 26           |                 |             |                |           | 0.0       |            | (30.0-34.5') CLAY, high plasticity, no dilatancy; trace silt; trace granules, subrounded to subangular; soft; moist; dark gray (10YR 4/1).   | (0.0-40.0') Backfilled with bentonite. |      |
| 27           |                 |             |                |           | 0.0       |            |  |  |      |
| 28           |                 |             | 60             |           | 0.0       |            |  |  |      |
| 29           |                 |             |                |           | 0.0       |            |  |  |      |
| 30           |                 |             |                |           | 0.0       |            |  |  |      |
| 31           |                 |             |                |           | 0.0       |            | (34.5-35.0') SILT, nonplastic, rapid dilatancy; little sand, very fine; trace granules, subrounded to subangular; moist; grayish brown (2.5Y 5/2).   |  |      |
| 32           |                 |             |                |           | 0.0       |            |  |  |      |
| 33           |                 |             | 60             |           | 0.0       |            |  |  |      |
| 34           |                 |             |                |           | 0.0       |            |  |  |      |
| 35           |                 |             |                |           | 0.0       |            |  |  |      |
| 36           |                 |             |                |           | 0.0       |            | (35.0-38.0') CLAY, high plasticity, no dilatancy; little silt; trace sand, very fine to fine; trace granules, subrounded to subangular; very soft; moist to wet; dark gray (10YR 4/1).   |  |      |
| 37           |                 |             |                |           | 0.0       |            |  |  |      |
| 38           |                 |             | 57             |           | 0.0       |            |  |  |      |
| 39           |                 |             |                |           | 0.0       |            | (38.0-40.0') SAND, very fine to fine; some silt; trace clay; moist to wet; well sorted; grayish brown (2.5Y 5/2).  |  |      |
| 40           |                 |             |                |           | 0.0       |            |  |  |      |
| 41           |                 |             |                |           |           |            | End of boring at 40.0' bgs.  |  |      |

Remarks:

SOIL BORING LOG: 2013 \ARCADIS\US\COM\OFFICE\DATA\ANNOV\H\MICOM\MON\RACER\LANSING\WORKING DATA\ANALYSIS\BORING LOGS\RACER\LANSING MASTER.DAT\BASE\_091520.GPJ ARCADIS 2013.GDT 9/15/20