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# Evaluation of Delhi Township Wastewater Treatment Plant (WWTP) Biosolids Land Application Sites 03N02W29-DT01 & DT02

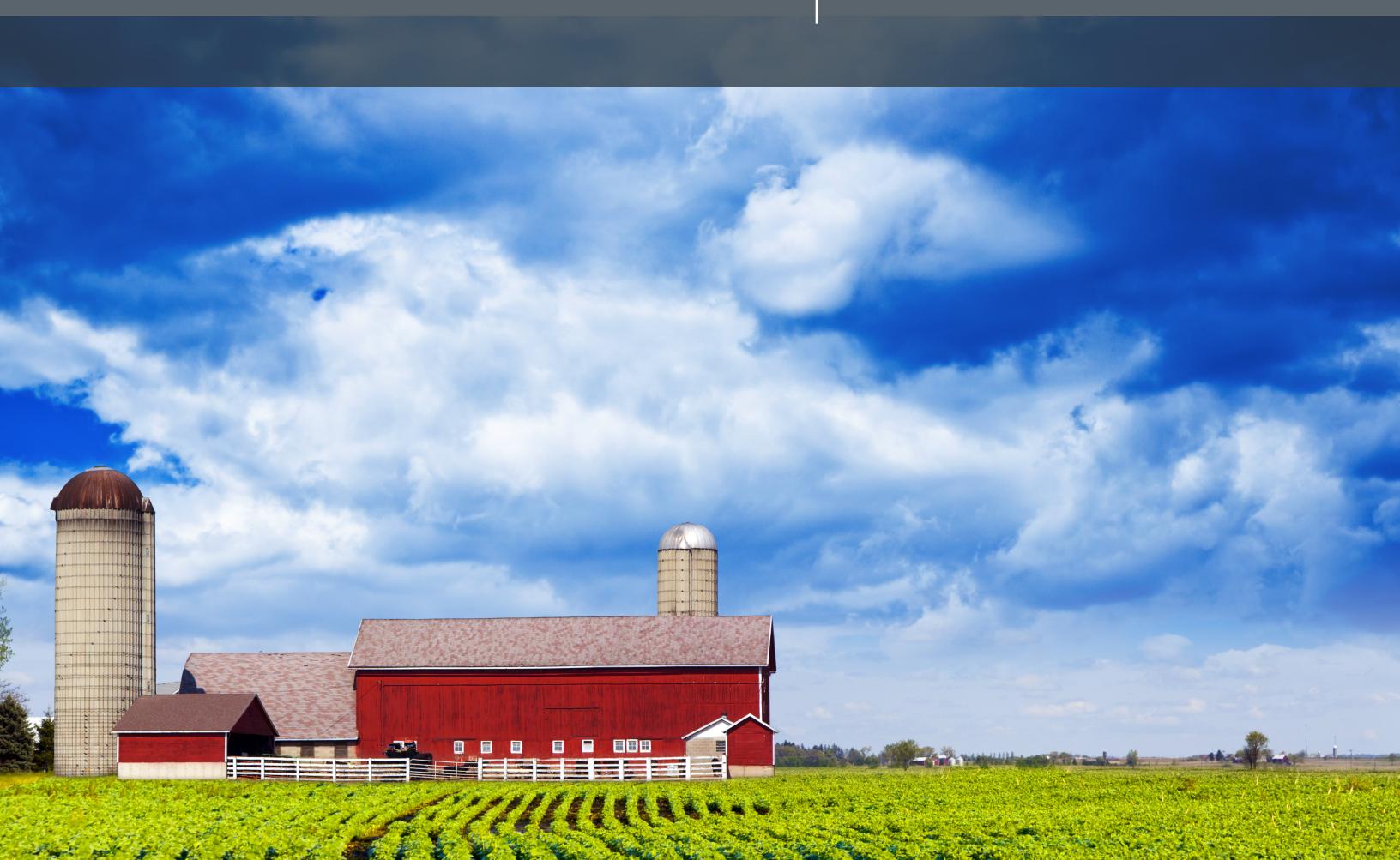
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## 1. Introduction

This technical memorandum summarizes and reports the findings of site investigations conducted at land application Sites 03N02W29-DT01 (Site DT01) and 03N02W29-DT02 (Site DT02) (**Figure 1**). The purpose of the investigation was to determine the impact, if any, from the land application of Per- and Polyfluoroalkyl Substances (PFAS)-impacted biosolids from the Delhi Township Wastewater Treatment Plant (WWTP) in the soil, groundwater, and adjacent surface water bodies.

The field investigation activities were designed to characterize soil, groundwater, and surface water conditions and collect data to evaluate the risk to human health and the environment from land applying potential PFAS-impacted biosolids. A review of existing data was used to guide the scope of this investigation. Field investigation activities at the Site included soil, groundwater, and surface water sampling activities.

## 2. Background

Site DT01 is a 12.3-acre field southeast of McCue Road and Grovenburg Road in Delhi Township, Michigan, bordering the northeast corner of the Delhi Township WWTP. The Blakeslee Drain flows along the eastern edge of Site DT02 until it connects with the Grovenburg Drain, which flows along the southern and eastern edge of Site DT01. Site DT02 is located directly south of Site DT01. Both Sites are owned by Delhi Charter Township.

Application to apply biosolids from the Delhi Township WWTP to Site DT01 was first received by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD) in 2001. Records indicate Site DT01 received 265.71 dry tons (dT) of biosolids from eight (8) applications by the Delhi Township WWTP from 2001 through 2018. Applications were consistent across a majority of the entire acreage of the Site and were relatively light or moderate, ranging from 17.4 to 56.1 dT and application rates of 2.1 to 18.6 dT per acre. The average application rate was 4.96 dT per acre. Application to apply biosolids from the Delhi Township WWTP to Site DT02 was first received by the EGLE WRD in 2003. Records indicate Site DT02 received 385.42 dT of biosolids from five (5) applications by the Delhi Township WWTP from 2003 through 2018. Applications were consistent across the entire acreage of the Site and were relatively light or moderate, ranging from 21.3 to 52 dT, with the exception in 2011 when 228 dT were applied. The application rate ranged from 2.13 to 16.26 dT per acre, with an average of 5.54 dT per acre. The application of biosolids for both Site DT01 and DT02 are presented in **Table 1**.

The investigation conducted by AECOM on behalf of EGLE was performed in accordance with applicable AECOM, EGLE, and US Environmental Protection Agency (USEPA) guidance documents, including the Scope of Work and the Quality Assurance Project Plan (QAPP), previously developed in 2018.

The USEPA has classified PFAS as emerging contaminants that are regulated by EGLE under Part 201, Environmental Remediation, and Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, Act 451 of 1994, as amended and their respective administrative rules, specifically Rule 299.44-299.50 (Generic Cleanup Criteria) and Rule 323.1057 (Rule 57) (Toxic Substances) of the Michigan Administrative Code. PFAS are a complex family of more than 4,750 human-made fluorinated organic chemicals. Due to their unique chemical properties, PFAS have been used in many industries and consumer products since the late 1950s. The Interstate Technology Regulatory Council (ITRC) has identified four

primary sources of PFAS: fire training/fire response sites, industrial sites, landfills, and wastewater treatment plants/biosolids.

AECOM initially sampled the Delhi Township WWTP on November 1, 2018. The Delhi Township WWTP has an approved Industrial Pretreatment Program (IPP) and authorization to discharge treated municipal wastewater under NPDES permit number MI0022781. The influent and effluent wastewater and anaerobically digested biosolids were sent to Vista Analytical Laboratories to be analyzed for 24 PFAS compounds recommended by EGLE as the PFAS Minimum Laboratory Analyte List. The Delhi Township WWTP influent, effluent, and biosolids were sampled again in August 2019 for PFOA and PFOS only by ALS Environmental Laboratories. The sampling in 2019 recorded similar PFOA and PFOS results as those initially reported in 2018, with low and non-detectable concentrations. It should be noted that the 2019 report included higher detectable limits for solids compared to 2018. The influent and effluent samples of the Delhi Township WWTP did not exceed the Rule 57 Water Quality Standards (WQS) for a surface water body not used as a drinking water source of 12 ng/L and 12,000 ng/L, for PFOS and PFOA. The results from both sampling events are summarized below.

| Sample Location | Sample Date | Total PFAS <sup>1</sup> | PFOA <sup>1</sup> | PFOS <sup>1</sup> |
|-----------------|-------------|-------------------------|-------------------|-------------------|
| Influent        | 11/1/2018   | <b>5.21</b>             | < 1.46            | < 1.46            |
| Effluent        | 11/1/2018   | <b>20.57</b>            | <b>2.33</b>       | <b>1.76</b>       |
| Biosolids       | 11/1/2018   | <b>34.09</b>            | < 0.85            | <b>2.68</b>       |
| Influent        | 8/28/2019   | --                      | < 1.8             | < 4.4             |
| Effluent        | 8/28/2019   | --                      | <b>5.5</b>        | < 4.2             |
| Raw Sludge      | 8/28/2019   | --                      | < 20              | < 20              |
| Digested Sludge | 8/28/2019   | --                      | < 43              | < 43              |

<sup>1</sup>Units for aqueous samples are in nanograms per liter (ng/L) or parts per trillion (ppt) and the solids are in micrograms per kilogram (µg/Kg) or parts per billion (ppb).

The Delhi Township WWTP has been approved to apply biosolids to the neighboring farmland since 2001, which provided Sites DT01 and DT02 for the study of biosolids from an IPP WWTP in the soil, surface water, and groundwater. The Delhi Township WWTP has an approved IPP but does not have the type of industrial users expected to be sources of PFAS. During its participation in the IPP PFAS Initiative, the Delhi Township WWTP found no sources of PFAS. EGLE conducted an initial, limited investigation in April 2019 at the Delhi Township WWTP Sites DT01 and DT02 that included the collection of four (4) surface soil samples and three (3) surface water samples. In January 2020, eight (8) groundwater samples were collected from eight (8) monitoring wells installed at four (4) locations (**Figure 2**).

The analytical results from sampling the influent, effluent, and biosolids at the Delhi Township WWTP represents only the conditions at the time of sampling. There is not enough historic information to accurately estimate the concentrations of PFOA and PFOS within the Delhi Township WWTP in the past, including the biosolids. It is documented that PFOA and PFOS were much more widely used in the past. As a result, concentrations in all environmental matrices found in agricultural fields where Delhi Township WWTP biosolids were land applied in the past may not be closely correlated to current concentrations found within the WWTP. However, biosolids associated with IPP WWTPs are expected to have higher PFAS concentrations than those from non-IPP WWTPs. The Delhi Township WWTP and agricultural fields DT01 and DT02, were selected to compare with other WWTPs and agricultural fields that participate in the IPP that had lower PFAS concentrations in their biosolids and non-IPP WWTPs and agricultural fields.

### 3. Hydrogeology/Geology

The geology and topography of Sites DT01 and DT02 are the result of glacial activity. The glacial aquifers consist of sand and gravel that are part of a thick sequence of Pleistocene glacial deposits (**Figure 8**). The area is composed of end moraines of coarse-textured till and lacustrine deposits that are predominately composed of clay and silt. Soil borings installed during the investigation generally encountered surficial sand containing silt and/or gravel intermixed by 10 to 15 feet of clay. Soil boring logs are provided in **Appendix A**.

The USDA Natural Resources Conservation Service Web Soil Survey identified four (4) primary types of surface soils from where samples were collected. The surface soils are described as the Matherton sandy loam (MrA), Colwood-Brookston loams (Co), Palms muck (Pa), and Conover loam (Cvraab). Both Matherton sandy loam and Colwood-Brookston loam are from outwash and lake plains, with higher loam content over glacial deposits. The Palms muck lithology contains herbaceous organic material over a loamy soil from drainageways/swamp-like conditions. The Conover loam is loamy till from ground moraines.

Regional groundwater flow is expected to generally be towards surface water bodies such as ponds and streams. The general groundwater elevation map based on EGLE-provided shallow groundwater elevation data indicates groundwater flows to the south in Site DT01 (the northern site) and to the north in Site DT02 (the southern site) (**Figure 2**). The figure also shows that the primary groundwater discharge point is the Grovenburg Drain of the Grand River, located centrally between Site DT01 and Site DT02, and flows from east to west.

### 4. Scope of Work

Soil, groundwater, and surface water samples were collected from the agricultural fields to evaluate the potential PFAS impact from the Delhi Township WWTP biosolids. The soil, groundwater, and surface water samples were submitted to Vista Analytical Laboratory and analyzed for EGLE's recommended minimum analyte list of 24 PFAS compounds provided below, using an isotope dilution method. Soil samples were additionally sent to Test America Laboratories for total organic carbon (TOC) analysis using the Lloyd Kahn Method.

| PFAS Name                                  | Carbon Chain length (C#) | Acronym | CAS #      |
|--|--------------------------|---------|------------|
| Perfluorobutanoic Acid <sup>1</sup>        | C4                       | PFBA    | 375-22-4   |
| Perfluoropentanoic Acid <sup>1</sup>       | C5                       | PPPeA   | 2706-90-3  |
| Perfluorohexanoic Acid <sup>1</sup>        | C6                       | PFHxA   | 307-24-4   |
| Perfluoroheptanoic Acid <sup>1</sup>       | C7                       | PFHpA   | 375-85-9   |
| Perfluorooctanoic Acid <sup>1</sup>        | C8                       | PFOA    | 335-67-1   |
| Perfluorononanoic Acid <sup>1</sup>        | C9                       | PFNA    | 375-95-1   |
| Perfluorodecanoic Acid <sup>1</sup>        | C10                      | PFDA    | 335-76-2   |
| Perfluoroundecanoic Acid <sup>1</sup>      | C11                      | PFUnDA  | 2058-94-8  |
| Perfluorododecanoic Acid <sup>1</sup>      | C12                      | PFDoDA  | 307-55-1   |
| Perfluorotridecanoic Acid <sup>1</sup>     | C13                      | PFTrDA  | 72629-94-8 |
| Perfluorotetradecanoic Acid <sup>1</sup>   | C14                      | PFTeDA  | 376-06-7   |
| Perfluorobutane Sulfonic Acid <sup>2</sup> | C4                       | PFBS    | 375-73-5   |

| PFAS Name  | Carbon Chain length (C#) | Acronym  | CAS #       |
|--|--------------------------|----------|-------------|
| Perfluoropentane Sulfonic Acid <sup>2</sup>                  | C5                       | PFPeS    | 2706-91-4   |
| Perfluorohexane Sulfonic Acid <sup>2</sup>                   | C6                       | PFHxS    | 355-46-4    |
| Perfluoroheptane Sulfonic Acid <sup>2</sup>                  | C7                       | PFHpS    | 375-92-8    |
| Perfluorooctane Sulfonic Acid <sup>2</sup>                   | C8                       | PFOS     | 1763-23-1   |
| Perfluorononane Sulfonic Acid <sup>2</sup>                   | C9                       | PFNS     | 474511-07-4 |
| Perfluorodecane Sulfonic Acid <sup>2</sup>                   | C10                      | PFDS     | 335-77-3    |
| Perfluorooctane Sulfonamide <sup>3</sup>                     | C8                       | FOSA     | 754-91-6    |
| 4:2 Fluorotelomer Sulfonic Acid <sup>4</sup>                 | C4                       | 4:2 FTSA | 757124-72-4 |
| 6:2 Fluorotelomer Sulfonic Acid <sup>4</sup>                 | C6                       | 6:2 FTSA | 27619-97-2  |
| 8:2 Fluorotelomer Sulfonic Acid <sup>4</sup>                 | C8                       | 8:2 FTSA | 39108-34-4  |
| N-Ethyl Perfluorooctane Sulfonamidoacetic Acid <sup>5</sup>  | C8                       | EtFOSAA  | 2991-50-6   |
| N-Methyl Perfluorooctane Sulfonamidoacetic Acid <sup>6</sup> | C8                       | MeFOSAA  | 2355-31-9   |

<sup>1</sup>Perfluoroalkyl Carboxylic Acids (PFCAs) Family is composed of the following PFAS: PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUnDA, PFDoDA, PFTDA, PFTeDA

<sup>2</sup>Perfluoroalkane Sulfonic Acids (PFSAs) Family is composed of the following PFAS: PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFNS, PFDS

<sup>3</sup>Perfluoroalkane Sulfonamides (FASAs) Family is composed of the following PFAS: FOSA

<sup>4</sup>(n:2) Fluorotelomer Sulfonic Acids (FTSAs) Family is composed of the following PFAS: 4:2 FTSA, 6:2 FTSA, 8:2 FTSA

<sup>5</sup>N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (EtFASAs) Family is composed of the following PFAS: EtFOSAA

<sup>6</sup>N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (MeFASAs) Family is composed of the following PFAS: MeFOSAA

## 5. Surface Soil

The locations of soil samples were selected based on previous studies, soil types, surface water flow and were generally biased with the intent of obtaining the highest possible concentrations as a worst-case scenario. A total of four (4) 50 by 50 feet Decision Units (DUs) were identified for soil sampling. Two (2) DUs were selected within Site DT01 and two (2) within Site DT02. The biosolids were assumed to have been applied consistently at a depth of eight (8) inches across the agricultural fields based on information provided by EGLE. As a result, soil samples were collected from each DU, which consisted of one (1) sample composed of nine (9) aliquots, from a depth of six (6) to eight (8) inches using a ¾" diameter soil sampler core. All nine (9) aliquots from each DU were homogenized into one sample. The four (4) soil samples were analyzed for PFAS and TOC.

The first DU soil sample (DT01-DU01) was sampled within the Colwood-Brookston loams (Co). The second DU (DT01-DU02) was sampled within the Matherton sandy loam (MrA). The third DU (DT02-DU01) was sampled within the Palms muck (Pa). The fourth DU (DT02-DU02) was sampled in the Conover loam (Cvraab). The soils identified in the Delhi Township WWTP Sites DT01 and DT02 are shown in **Figure 2** and described in **Appendix C**. The analytical results are summarized in the table below and attached in **Table 2** and **Figure 3**.

| Soil Sample ID    | Sample Date | Field Site | Total PFAS <sup>1</sup> | PFOA <sup>1</sup> | PFOS <sup>1</sup> |
|-------------------|-------------|------------|-------------------------|-------------------|-------------------|
| SXDU11904091050MK | 4/9/2019    | DT01-DU01  | <b>1.82</b>             | < 0.986           | <b>1.82</b>       |
| SXDU21904091155MK | 4/9/2019    | DT01-DU02  | <b>14.82</b>            | < 0.991           | <b>8.98</b>       |
| SXDU11904091350MK | 4/9/2019    | DT02-DU01  | <b>2.84</b>             | < 0.979           | <b>2.84</b>       |
| SXDU21904091300MK | 4/9/2019    | DT02-DU02  | <b>8.23</b>             | 1.52              | <b>5.36</b>       |

<sup>1</sup>Units are in micrograms per kilogram ( $\mu\text{g}/\text{Kg}$ ) or parts per billion (ppb)

All soil samples collected from the four (4) DUs had some PFAS compounds detected. Of the 24 analytes, only five (5) PFAS compounds were detected throughout the samples: PFOA, PFDA, PFDoDA, PFOS, and MeFOSAA. PFOS was the only compound detected in all four (4) samples with concentrations of 1.82 to 8.98  $\mu\text{g}/\text{Kg}$ . Three (3) of the four (4) soil samples did not detect values for PFOA, with only one (1) detection of 1.52  $\mu\text{g}/\text{Kg}$ . The area of highest total PFAS concentration was DT01-DU02 with the value of 14.82  $\mu\text{g}/\text{Kg}$ . All four (4) soil samples collected resulted in relatively low total PFAS concentrations compared to soil samples collected from other agricultural fields associated with industrially impacted biosolids from other municipal WWTPs with significant industrial sources.

The total organic carbon (TOC) analytical results ranged from 17,000 to 100,000 milligrams per kilogram (mg/Kg). The maximum TOC value is associated with DT02-DU01 and the Palms muck (Pa) lithology, with a value of 100,000 mg/Kg. The remaining three (3) soil samples detected lower TOC concentrations between 17,000 to 18,000 mg/Kg. **Table 2** summarizes the soil PFAS and TOC data by DU, and **Figure 3** shows the total PFAS concentration and soil classification for each sample.

## 6. Surface Water

Surface water samples were collected from three (3) locations from Sites DT01 and DT02, from either the Grovenburg or Blakeslee Drains of the Grand River. DT01/02-SW01 was collected from the Grovenburg Drain downstream/west of both Sites DT01 and DT02, and east of the Delhi Township WWTP. DT01/02-SW03 was also collected in the Grovenburg Drain, however, upstream/east of Site DT01. DT01/02-SW04 was collected from the Blakeslee Drain of the Grand River, upstream/east of Site DT02. The Scope of Work called for the collection of four (4) surface water samples; however, one (1) surface water sample, DT01/02-SW02, was unable to be collected due to inaccessibility. The analytical results are summarized in the table below and attached in **Table 3** and **Figure 4**.

| Surface Water Sample ID | Sample Date | Field Site   | Total PFAS <sup>1</sup> | PFOA <sup>1</sup> | PFOS <sup>1</sup> |
|-------------------------|-------------|--------------|-------------------------|-------------------|-------------------|
| SW011904091015RL        | 4/9/2019    | DT01/02-SW01 | <b>18.36</b>            | <b>2.87</b>       | < 2.25            |
| SW031904091125RL        | 4/9/2019    | DT01/02-SW03 | <b>9.71</b>             | <b>1.59</b>       | < 2.10            |
| SW041904091255RL        | 4/9/2019    | DT01/02-SW04 | <b>4.44</b>             | < 2.20            | < 2.20            |

<sup>1</sup>Units are in nanograms per liter (ng/L) or parts per trillion

All three (3) surface water samples were below the Rule 57 WQS for PFOS and PFOA (**Section 10**), with PFOS being non-detect and PFOA ranging from non-detect to low concentrations (**Table 3**).

The highest total PFAS concentration was collected in DT01/02-SW01 located on the Grovenburg drain to the west of both Sites, DT01 and DT02, downstream of the surface water

flow. The lowest total PFAS concentration was DT01/02-SW04, upgradient of surface water flow, east of Site DT02 from the Blakeslee drain.

## 7. Groundwater

During December 9 to 13, 2019, AECOM and Mateco Drilling Co. installed eight (8) monitoring wells throughout the Sites. Before any intrusive work was performed, a utility clearance was conducted by MISS DIG, Michigan's one-call utility locating service. Mateco Drilling Company used Ground Penetrating Technology (GPR) to conduct a sub-surface investigation around the boring site locations. All boring site locations marked by AECOM were cleared. No anomalies were encountered that would suggest any of the sampling locations needed to be relocated.

Four (4) drilling locations were selected across Sites DT01 and DT02. A pair of shallow (S) and deep (D) wells were installed at each drilling location. DT01-MW01(S, D) and DT02-MW02(S, D) boring locations were placed on the upgradient region of each Site. DT01-MW01(S, D) was set within the Matherton sandy loam, along the northern edge of Site DT01. DT02-MW02(S, D) was set along the southern edge of Site DT02 within the Conover loam. DT01-MW02(S, D) and DT02-MW01(S, D) boring locations were placed downgradient on each field, near the Grovenburg Drain, within the Colwood-Brookston loams.

The scope of work proposed four (4) monitoring well locations be installed in areas outside of the active farming fields and where data was needed within the farm fields. The up and downgradient locations of the eight (8) total groundwater wells were selected to provide vertical and horizontal groundwater flow information for PFAS. Monitoring well locations are as shown in **Figure 2**, and results are discussed in **Figure 5** and **Table 4**.

### 7.1 Permanent Monitoring Wells

Mateco Drilling Co. completed the soil borings by hand auguring the first five (5) feet below ground surface (bgs) and then using a Geoprobe 7822DT to drill to depth, typically stopping due to refusal or a very hard till-like lithology. Both hand auguring and 2-inch dual tube system were continuously used to core soils. Cored soils were logged using the Unified Soil Classification System (USCS) from the surface to total depth. Soil boring logs are provided in **Appendix A** and a photolog of the soil cuttings from the borings is provided in **Appendix D**. The initial borehole drilled per location provided lithology until refusal, allowing this borehole to act as the deep well at each Site. Once total depth was reached, hollow stem auger drilling was utilized to over drill the soil boring to the final depth. Additionally, an adjacent second borehole was blind drilled using the hollow stem auger to various shallow depths depending on the screen selection from the geologic soil log of the deep borehole. The borings ranged in depth from seven (7) to 40 feet bgs.

Monitoring wells were installed through the annulus of the hollow stem augers as the augers were extracted from the ground. Monitoring wells were constructed of 2-inch diameter, Schedule 40, polyvinyl chloride (PVC) well casing, and 5-foot long, 10-slot well screens. An appropriately sized filter sand pack was installed around each well screen to approximately 1-foot above the screened interval. The screens were placed in wet sand layers encountered at deep and shallow depths to ensure groundwater sampling success once installed. A 2-foot thick bentonite seal, hydrated in-place, was placed on top of the filter sand pack to isolate the well screen from the remaining borehole. Bentonite chips were then used to seal the remaining annual space within three (3) feet of the ground surface. Each monitoring well was completed at the ground surface with a stickup steel locking protective cover set in concrete surrounded by three (3) safety bollards for protection from any farming equipment. An expandable J-plug was provided for each monitoring well.

## 7.2 Groundwater Sampling

Eight (8) groundwater samples were collected within Sites DT01 and DT02 from all of the permanent monitoring wells at the four (4) locations (**Figure 2**). The monitoring wells were allowed to equilibrate for a total of one (1) month after the installation and development. Before collecting the groundwater samples, static water levels were measured using an electronic water tape from the top of the well casing of each of the wells. Each monitoring well was purged, and groundwater samples were collected for PFAS analysis in laboratory supplied containers. Water quality parameters (temperature, specific conductance, pH, dissolved solids, oxidation-reduction potential, and turbidity) were recorded following AECOM groundwater Standard Operating Procedures using a YSI Pro DDS water quality meter. Water quality measurements recorded during purging are summarized in **Table 5** and **Appendix B**. The analytical data are summarized in the table below and attached in **Table 4** and **Figure 5**.

| Ground Water Sample ID | Sample Date | Field Site | Total PFAS <sup>1</sup> | PFOA <sup>1</sup> | PFOS <sup>1</sup> |
|------------------------|-------------|------------|-------------------------|-------------------|-------------------|
| GW2001131025RAP        | 1/13/2020   | DT01-MW1S  | <b>21.39</b>            | <b>3.00</b>       | <b>1.50</b>       |
| GW2001131155RAP        | 1/13/2020   | DT01-MW1D  | < 2.00                  | < 2.00            | < 2.00            |
| GW2001131320RAP        | 1/13/2020   | DT01-MW2S  | <b>20.2</b>             | < 2.03            | < 2.03            |
| GW2001131320RAP-FD     | 1/13/2020   | DT01-MW2S  | <b>20.4</b>             | < 1.99            | < 1.99            |
| GW2001131435RAP        | 1/13/2020   | DT01-MW2D  | < 2.02                  | < 2.02            | < 2.02            |
| GW2001141055RAP        | 1/14/2020   | DT02-MW1S  | <b>96.8</b>             | <b>5.65</b>       | < 2.12            |
| GW2001141210RAP        | 1/14/2020   | DT02-MW1D  | <b>2.22</b>             | < 1.96            | < 1.96            |
| GW2001131535RAP        | 1/13/2020   | DT02-MW2S  | <b>2.67</b>             | < 1.98            | < 1.98            |
| GW2001131620RAP        | 1/13/2020   | DT02-MW2D  | <b>7.72</b>             | < 2.00            | < 2.00            |

<sup>1</sup>Units are in nanograms per liter (ng/L) or parts per trillion (ppt)

All samples taken from the eight (8) monitoring wells did not exceed Part 201 Residential and Nonresidential Drinking Water Criteria (DWC) for PFOA, PFOS, PFNA, PFHxS, PFHxA, and PFBS of 8, 16, 6, 51, 400,000, and 420 ng/L, respectively (**Table 4**).

At Site DT01, the two (2) shallow wells detected total PFAS concentrations, whereas the two (2) deep wells did not report detectable values of total PFAS. Three (3) of the four (4) monitoring wells resulted in non-detect concentrations for both PFOA and PFOS. Only DT01-MW01S detected PFOA and PFOS concentrations with values of 3.0 ng/L and 1.5 ng/L, and a total PFAS value of 21.39 ng/L. The second shallow well on Site DT01, DT01-MW01S, reported a total PFAS concentration of 20.2 ng/L. DT01-MW01S is screened from two (2) to seven (7) ft bgs, and DT01-MW02S is screened slightly deeper from 6.5 to 11.5 ft bgs. The shallow monitoring wells on both Site DT01 and DT02 all detected higher PFAS concentrations likely due to their screen placement depth and lithology. The relationship between screen depth and lithology is further described in **Section 11.3**.

At Site DT02, all four (4) wells reported concentrations of total PFAS. The highest groundwater total PFAS concentration was collected from the northwest corner at DT02-MW01S, with a value of 98.6 ng/L. It should be noted that DT02-MW01S was screened from two (2) to seven (7) ft bgs, likely in a perched groundwater zone. The remaining three (3) monitoring wells at Site DT02 resulted in non-detectable values for PFOA and PFOS, and total PFAS values ranging from 2.22 to 7.72 ng/L.

Groundwater flow is based on static water levels measured in the eight (8) monitoring wells (**Table 5**) and the location of nearby surface water bodies. The groundwater flow direction is

generally to the south for Site DT01 and the north for Site DT02, due to groundwater flowing towards the Grovenburg Drain of the Grand River (**Figure 6**).

## 8. QA/QC Results

Laboratory reports 1900730 (Soil), 1900730 (Surface Water), and 2000118 (Groundwater) from Vista Analytical Laboratories and report 460-179559-1 from Test America Laboratory were subjected to data quality review (**Appendix E**). The reports were evaluated for data completeness, holding times and sample preservation, method and field blanks, ongoing precision and recovery (OPR), field duplicate precision, extracted internal standard recoveries, and reporting issues.

The initial calibration and continuing calibration verifications met the method acceptance criteria. A method blank and ORP sample was extracted and analyzed with each preparation batch. No analytes were detected in the method blank above half (1/2) the Limit of Quantification (LOQ). The OPR recoveries were within the method acceptance criteria. No quality issues were identified for any of the samples, and all of the results were considered usable.

## 9. Investigation-Derived Waste (IDW)

Investigation-derived waste (IDW) generated during the investigation included the following:

- Disposable material such as Geoprobe® liners, personal protective equipment (PPE), plastic sheeting, etc.
- Drill cuttings
- Excess soil leftover from sampling activities
- Well development water
- Purge water
- Decontamination water

Minimally contaminated disposable sampling materials and PPE were containerized and disposed of as ordinary solid waste. Drill cuttings, excess soil from sampling, well development water, purge water, and decontamination water were discharged to the ground surface adjacent to where the material was generated.

## 10. Pathway and Receptors Evaluation

An exposure pathway includes five components: the source of contamination, environmental media and transport mechanism, the point of exposure, route of exposure, and receptor population. A pathway is considered potentially complete if all five components are present, and one or more hazardous substances are detected. The human health risk associated with a potentially complete exposure pathway is acceptable if concentrations do not exceed the applicable criteria and background concentrations (Rule 299.1013(3)). Ecological risks are acceptable if concentrations do not exceed water quality values or soil screening values. Potentially complete groundwater exposure pathways associated with Sites DT01 and DT02 and corresponding Part 201 cleanup criteria are:

- Part 201 Residential and Nonresidential Drinking Water Criteria (DWC):
  - PFOA = 8 ng/L
  - PFOS = 16 ng/L
  - Perfluorononanoic acid (PFNA) = 6 ng/L
  - Perfluorohexane sulfonic acid (PFHxS) = 51 ng/L
  - Perfluorohexanoic acid (PFHxA) = 400,000 ng/L
  - Perfluorobutane sulfonic acid (PFBS) = 420 ng/L
  - Hexafluoropropylene oxide dimer acid (HFPO-DA) 370 ng/L
- Groundwater-Surface Water Interface (GSI) Criteria: PFOA = 12,000 ng/L and PFOS = 12 ng/L

Additionally, EGLE only regulates PFOA and PFOS in the surface water. Criteria under the Michigan Rule 57 WQS were developed to protect humans, wildlife, and aquatic life. Potentially complete surface water exposure pathways associated with all Sites and corresponding Rule 57 WQS are:

| PFAS              | Human Noncancer Value (nondrinking water source) | Human Noncancer Value (drinking water source) | Final Chronic Value | Final Acute Value | Aquatic Maximum Value |
|-------------------|--|---|---------------------|-------------------|-----------------------|
| PFOS <sup>1</sup> | 12   | 11  | 140,000             | 1,600,000         | 780,000               |
| PFOA <sup>1</sup> | 12,000   | 420   | 880,000             | 15,000,000        | 7,700,000             |

<sup>1</sup>Units are in nanograms per liter (ng/L) or parts per trillion (ppt). These units are considered equivalent.

Potentially complete soil exposure pathways associated with all Sites and corresponding Part 201 cleanup criteria (if available) are:

- Direct Contact Criteria (DCC; criteria not available)
- Human exposure by consuming impacted vegetation (gardening, farming; screening levels not available)

Potential receptors associated with groundwater are:

- People who use impacted groundwater for drinking water

Potential receptors associated with surface water are:

- People using the drains and streams and other impacted surface waters for recreation and fishing.
- Fish and other aquatic life.

Potential receptors associated with soil are:

- Residents living at or near impacted soil areas.
- Non-residential use of impacted soil areas, such as farming and commercial use

## 10.1 Surface Soil Evaluation

On-site farm workers may encounter surficial soils with detectable PFAS concentrations; however, no Part 201 direct contact criteria have been established for any PFAS compounds,

including PFOS and PFOA. All soil samples collected from the four (4) DUs had some PFAS compounds detected. PFOS was the only compound detected in all the four samples with concentrations of 1.82 to 8.98 µg/Kg. Three (3) out of the four (4) soil samples were non-detect for PFOA, with only one detection of 1.52 µg/Kg. The area of highest total PFAS soil concentrations was DT01-DU02 with the value of 14.82 µg/Kg. All four (4) soil samples collected resulted in relatively low total PFAS concentrations (**Table 2**) compared to soil samples collected from other agricultural fields associated with industrially impacted biosolids from other municipal WWTPs with significant PFAS sources.

Studies have shown that PFAS does have the potential for plant uptake. Depending on the plant type and PFAS compound, the accumulation of PFAS is not evenly distributed throughout the major components of the plant. Some of the PFAS will accumulate more in the roots, while others accumulate in the leaves or fruits. However, exposure to PFAS via plant uptake through direct or indirect ingestion of PFAS-impacted plants may also be possible. Crops used for animal feed production (e.g., silage) may potentially allow the PFAS to bioaccumulate in the livestock. Currently, there are no PFAS criteria for plants; however, a consumption advisory could be developed in the future like those for fish.

## 10.2 Surface Water Evaluation

PFAS concentrations were detected in all three (3) surface water samples. Two (2) of the three (3) samples detected low PFOA concentrations. However, none of the locations detected values of PFOS (**Table 3**). Rule 57 WQS were not exceeded in any surface water samples for PFOS (12 ng/L) or PFOA (12,000 ng/L).

## 10.3 Groundwater Evaluation

Approximately 50 private/household wells (residential wells) were identified close to Sites DT01 and DT02 (**Figure 7**) using the EGLE Wellogic database. The EGLE Wellogic database does not include all of the well records; however, a review of additional scanned well logs were also performed. Based on the results of this investigation, there is no unacceptable risk based on Part 201 DWC. Groundwater may be used for agricultural irrigation; however, no irrigation wells are located on Site DT01 or DT02. All groundwater samples collected reported values below Part 201 DWC. Therefore, any installation of irrigation wells in the future does not suggest risk of Part 201 DWC exceedances. Note, groundwater samples collected as part of EGLE's Statewide Public Water Supply Sampling Program near the biosolids application sites were also non-detect for PFAS.

# 11. Summary and Discussion

AECOM conducted a field investigation to determine the impact, if any, from the land application of biosolids containing low levels of PFAS concentrations from the Delhi Township WWTP. This investigation expands EGLE's knowledge of PFAS at land application sites that may be associated with industrially impacted biosolids. Further, the investigation allows for comparison of PFAS in the soil, groundwater, and adjacent surface water bodies at Sites DT01 and DT02 to other agricultural fields associated with land application of biosolids not considered to be industrially impacted from non-IPP and IPP WWTPs. Land application field investigations will also help guide understanding of fate and transport of PFAS in environmental matrices and supplement fate and transport modeling analysis being conducted on this topic.

The soil, surface water, and groundwater sampling results indicate low PFAS concentrations in all three matrices due to the land applications of biosolids and are summarized in **Table 2**, **Table 3**, and **Table 4**. PFAS were detected in all four (4) surface soil samples (**Table 2** and

**Figure 3), all three (3) surface water locations (Table 3 and Figure 4), and six (6) of the eight (8) groundwater samples (Table 4 and Figure 5).** The laboratory reports are included in **Appendix E.**

PFAS such as PFBA, PFPeA, PFHxA, PFHpA, PFBS, and PFPeS have a shorter carbon chain length and are referred to as short-chain PFAS. While PFAS such as PFHxS, PFOA, and PFOS have longer fluorinated carbon chain lengths referred to as long-chain PFAS. The carbon chain length for PFBA and PFBS is four (4), and eight (8) for PFOA and PFOS. The shorter the carbon chain length for PFAS, the more mobile they are in the environment. As a result, long-chain PFAS are expected to concentrate and be present in the biosolids and soils at higher concentrations, while short-chain PFAS to be more frequently detected in the aqueous phases such as surface water, tile drains, and groundwater. The detection limits for the solid phase (i.e., biosolids and soil) are in the low micrograms per kilogram ( $\mu\text{g}/\text{Kg}$ ) or parts per billion (ppb) range. For the aqueous phase (i.e., surface water, tile drains, and groundwater), the detection limits are in the low nanograms per liter (ng/L) or parts per trillion (ppt). As a result, PFAS that are non-detect in the solid phase may still be present at very low concentrations below the detection limit and may be detected in the aqueous phases.

PFAS properties, including fate and transport in the environment, are still being studied and are currently not fully understood. Equations developed to estimate leachability and migration of PFAS have not been empirically verified at this time. EGLE is currently evaluating additional agricultural fields and performing subsurface modeling to better understand the fate and transport of PFOA and PFOS in the environment.

## 11.1 Soil

Based on EGLE's assessment of WWTPs, long-chain PFAS (e.g., PFOS and PFOA) accumulate at higher concentrations in sludge and biosolids; as a result, less short-chain PFAS are expected to be present in the land-applied biosolids when compared to long-chain PFAS. The soil results indicated that PFOS was the PFAS compound detected at the highest concentrations, varying from 1.82 to 8.98  $\mu\text{g}/\text{Kg}$ . However, the soil results showed that the PFOS concentrations in soils at Sites DT01 and DT02 were significantly lower than those detected at other agricultural fields (i.e., ~77 to 172  $\mu\text{g}/\text{Kg}$ ), where industrially impacted biosolids were applied. The PFOS concentrations in soils at Sites DT01 and DT02 were more similar to concentrations identified in some agricultural fields associated with land application of non-industrially impacted biosolids originated from non-IPP WWTPs. This indicates that the geological conditions at the Site could play a significant role.

Further, PFAS, especially the long-chain PFAS compounds, are known to adsorb more strongly to fine particles such as silt and clay, which contain more TOC. The TOC analysis indicates that the maximum TOC values are associated with DT02-DU01 and the Palms muck, located in the northeast area of Site DT02. However, DT02-DU01 did not have the highest PFAS concentrations, which indicates that site-specific environmental conditions could play a very significant role in environmental impacts.

A discussion about the PFAS concentrations in surface water and groundwater in relation to the soil samples is provided in **Section 11.2** and **11.3** below.

## 11.2 Surface Water

PFAS concentrations detected in surface water are likely related to surface runoff and potential discharge of shallow groundwater into the surface water body. A total of three (3) surface water samples were collected from Sites DT01 and DT02 (**Figure 4**). The highest total PFAS concentration was collected in DT01/02-SW01, downstream of surface water flow, and in the vicinity of the groundwater sample DT02-MW01S which reported the maximum detected total PFAS groundwater concentration. The shallow groundwater in the area likely discharges to the

surface water, affecting PFAS levels. Surface water runoff would also be expected to influence the PFAS concentrations in the Grovenburg Drain. PFAS were additionally detected in the two (2) upgradient surface water samples, DT01/02-SW01 and DT01/02-SW04, indicating that other PFAS sources may exist in the environment that are not related to the land application of the biosolids from the Delhi Township WWTP. All three (3) surface water results were below Rule 57 WQS for both PFOS and PFOA. PFOS was not detectable in all three (3) surface water samples, and PFOA was detected at low concentrations in two (2) of the three (3) locations with values of 1.59 and 2.87 ng/L.

### 11.3 Groundwater

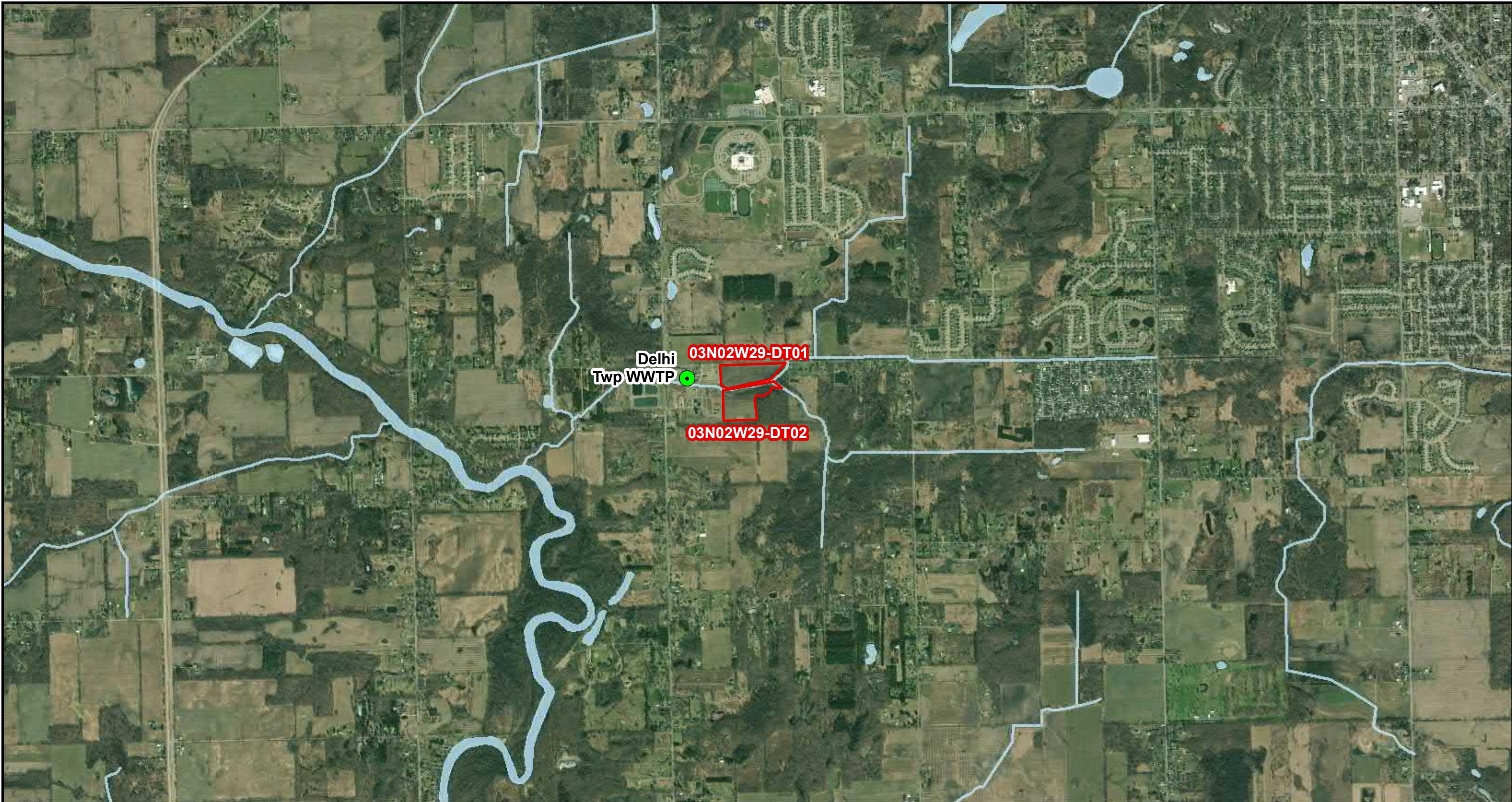
A total of eight (8) wells were installed as shallow and deep pairs at four (4) locations with four (4) wells DT01-MW1 (S, D) and DT01-MW2 (S, D) at Site DT01, and four (4) wells DT02-MW1 (S, D) and DT02-MW2 (S, D) at Site DT02. A total of eight (8) groundwater samples were collected within Sites DT01 and DT02 from all permanent monitoring wells (**Figures 5**).

The three (3) monitoring wells that reported the highest total PFAS groundwater concentrations (DT01-MW01S, DT01-MW02S, and DT02-MW01S) are the only monitoring well screens set within mixed lithologies of lean and fat clay with fine to medium gravelly sands. The maximum total PFAS concentration was detected in monitoring well DT02-MW01S (96.8 ng/L), where perched groundwater was encountered in silty medium sand with a gravel lens above a clay unit at a depth of approximately 2.5 ft bgs. The second and third highest total PFAS concentrations detected in groundwater are at DT01-MW01S and DT01-MW02S with screens set within various lithology of silty gravelly sands and fat clay. The remaining five (5) monitoring wells had no detectable PFOA or PFOS concentrations with low concentrations of total PFAS, and have screens set within only mixed sand and gravel zones.

The attached boring logs from **Appendix A** show intervals of deep clay throughout Sites DT01 and DT02. The only PFAS detected in deep wells were short-chain PFAS, such as PFBA and PFBS, which are more mobile in the environment, suggesting that deep silt and clay may prevent the migration of long-chain PFAS such as PFOA and PFOS. The total PFBA and PFBS were a high percentage of the total PFAS detected in many of the groundwater samples as well. Therefore, there likely is a stronger correlation of increased PFAS concentrations based on lithology on-site, rather than depth. Short-chain PFAS were detected at higher frequency and concentrations in groundwater samples compared to long-chain PFAS due to their higher mobility. Short-chain PFAS may still be present at very low concentrations below the detection limit in the solid phase (i.e., biosolids and soil) and be detected in the aqueous phase (i.e., surface water and groundwater) even when they are non-detect in the solid phase, due to a much lower detection limit for PFAS in the aqueous phase compared to the solid phase.

The groundwater at Sites DT01 and DT02 showed a low impact of short and long-chain PFAS, with no exceedance of the Part 201 DWC. Based on the regional groundwater flow, location of residential wells in the area, and minimal PFAS concentrations identified in the deep wells, there does not appear to be a potential risk to the drinking water wells.

# Figures



**AECOM**

Drawn: JS Date: 2/20/2020

Approved: DB Date: 2/20/2020

Project #:



**Legend**

● Waste Water Treatment Plant

■ Biosolids Application Field

0

1

2

Miles



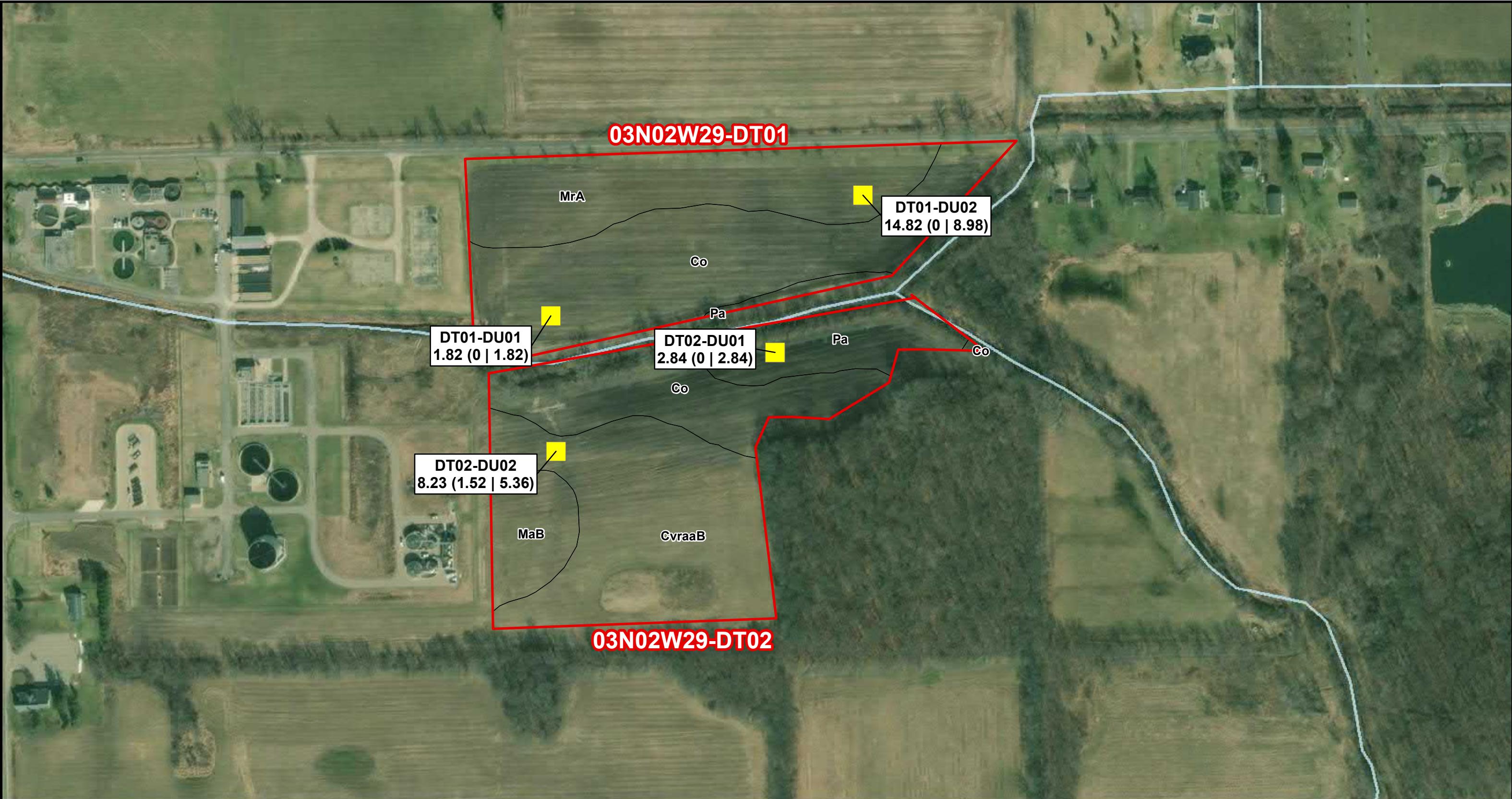
**FIGURE 1**  
**DELHI BIOSOLIDS APPLICATION FIELDS OVERVIEW**

DELHI, MI



**FIGURE 2**  
**03N02W29-DT01 & DT02**  
**SAMPLE LOCATIONS**

DELHI, MI



**AECOM**

Drawn: JS Date: 3/9/2020

Approved: DB Date: 3/9/2020

Project #:



#### Legend

|                              |                               |
|------------------------------|-------------------------------|
| 50' x 50' Soil Sampling Grid | ■ Biosolids Application Field |
| PFOS (ppb)                   | ■ Soil Type                   |
| Non-Detect                   |                               |
| >0 - 10                      |                               |
| >10 - 50                     |                               |
| >50 - 100                    |                               |
| >100 - 500                   |                               |
| >500                         |                               |

#### Sample Location

Total PFAS (PFOA | PFOS)

\*results reported in units of ppb

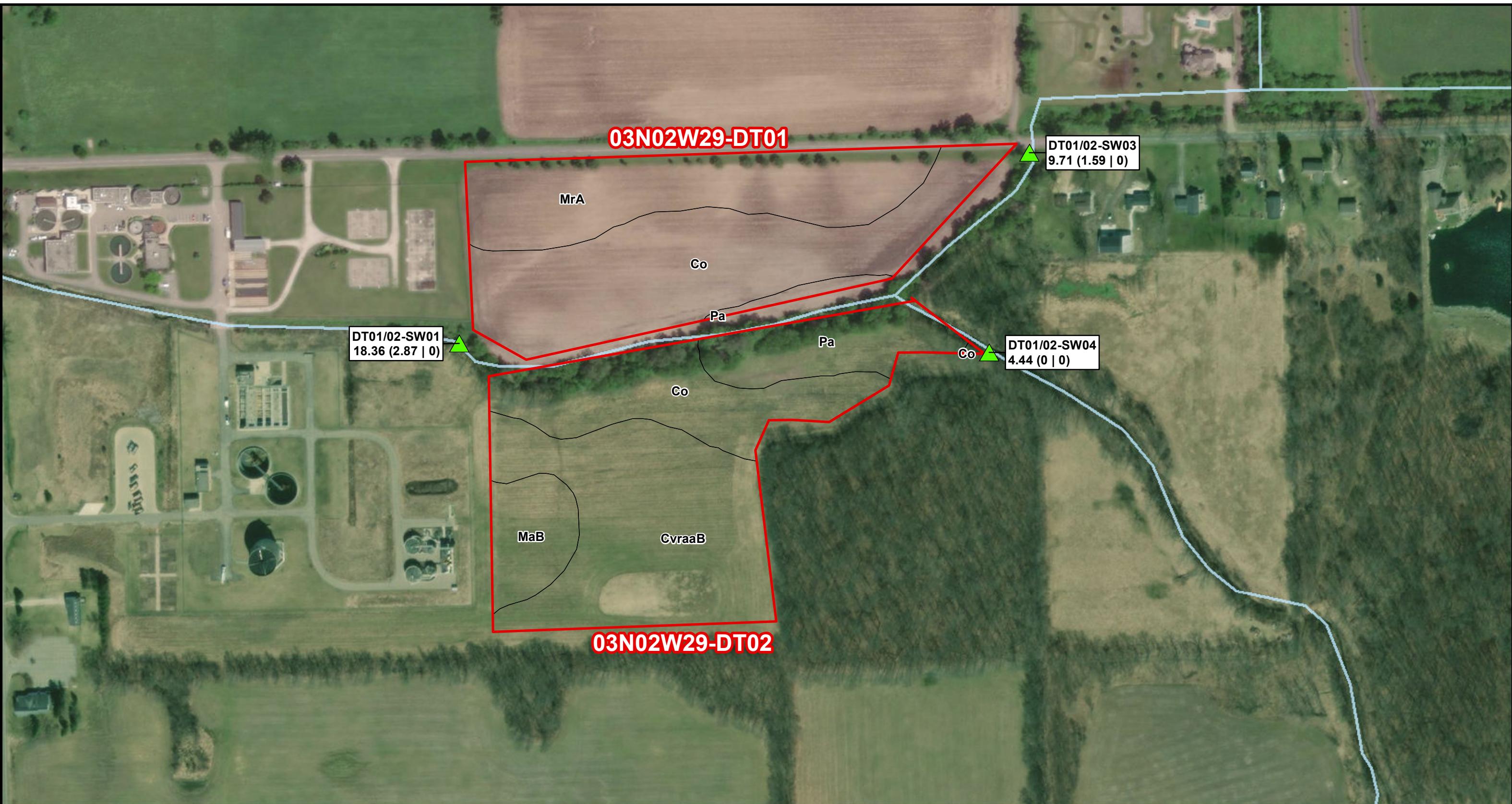
0 100 200 300 400 500

1,000  
Feet



**FIGURE 3**  
**03N02W29-DT01 & DT02**  
**SOIL SAMPLING RESULTS**

DELHI, MI

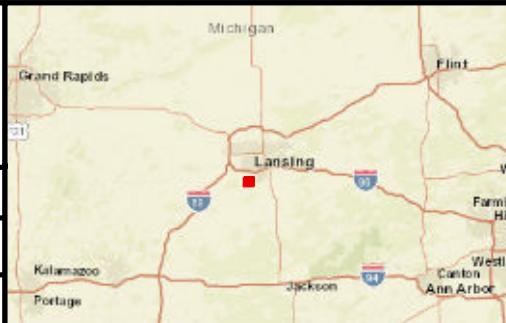


**AECOM**

Drawn: JS Date: 8/7/2020

Approved: DB Date: 8/7/2020

Project #:



**Legend**

**Surface Water Sample PFOS (ppt)**

- Below Detection Limit (DL)**
- >DL - ≤12**
- >12**

**Biosolids Application**

**Soil Type**

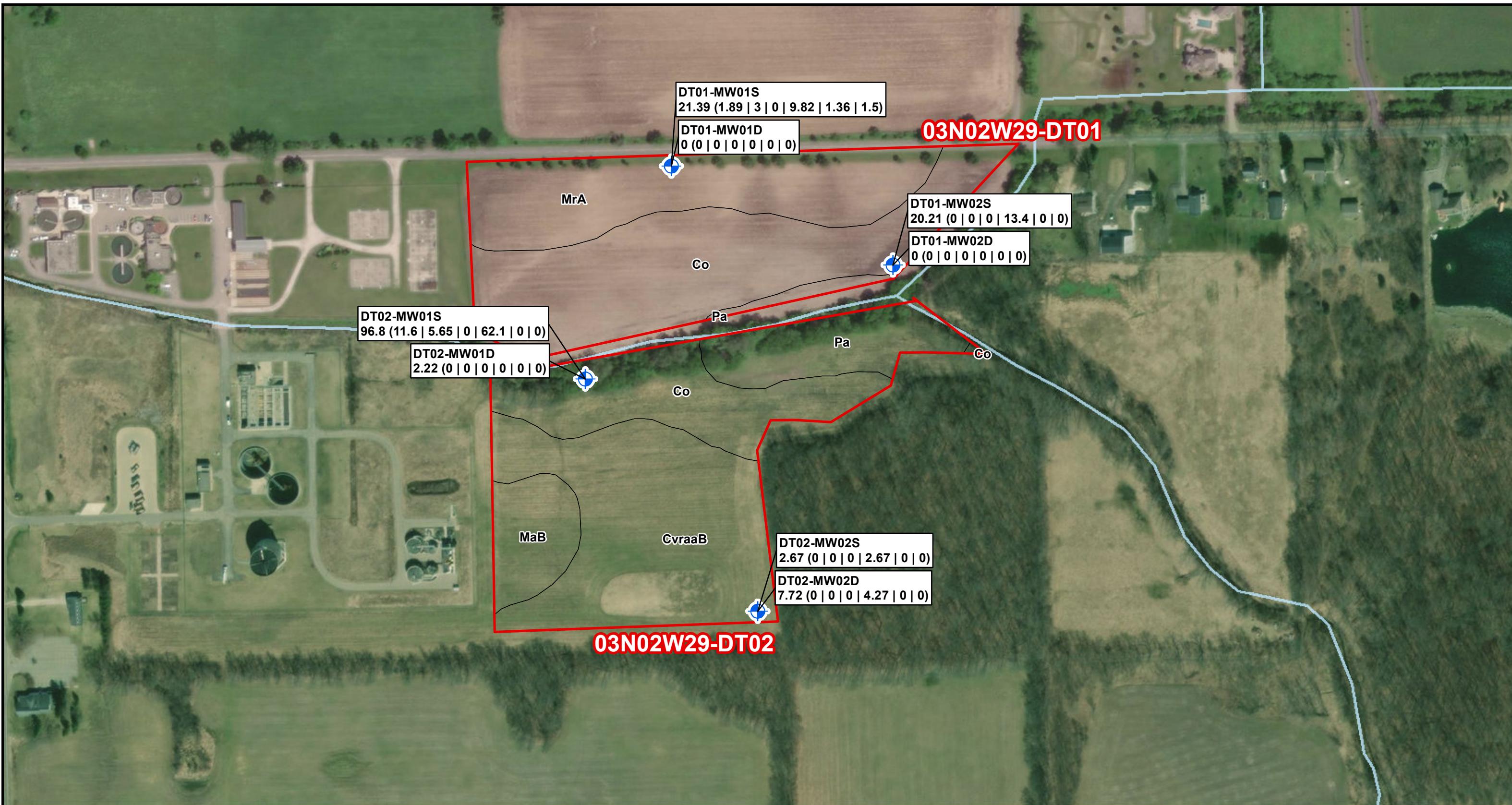
**Sample Location**

**Total PFAS (PFOA | PFOS)**

\*results reported in units of ppt



**FIGURE 4**  
**03N02W29-DT01 & DT02**  
**SURFACE WATER SAMPLING RESULTS**  
**DELHI, MI**



**AECOM**

Drawn: DP Date: 12/29/2020

Approved: DB Date: 12/29/2020

Project #: 60588767



**Legend**

- Monitoring Well Sample
- Biosolids Application
- Soil Type

**Sample Location**

**Total PFAS (PFHxA | PFOA | PFNA | PFBS | PFHxS | PFOS)**

red text indicates exceedance of Part 201 DWC

All sample results are in ng/L

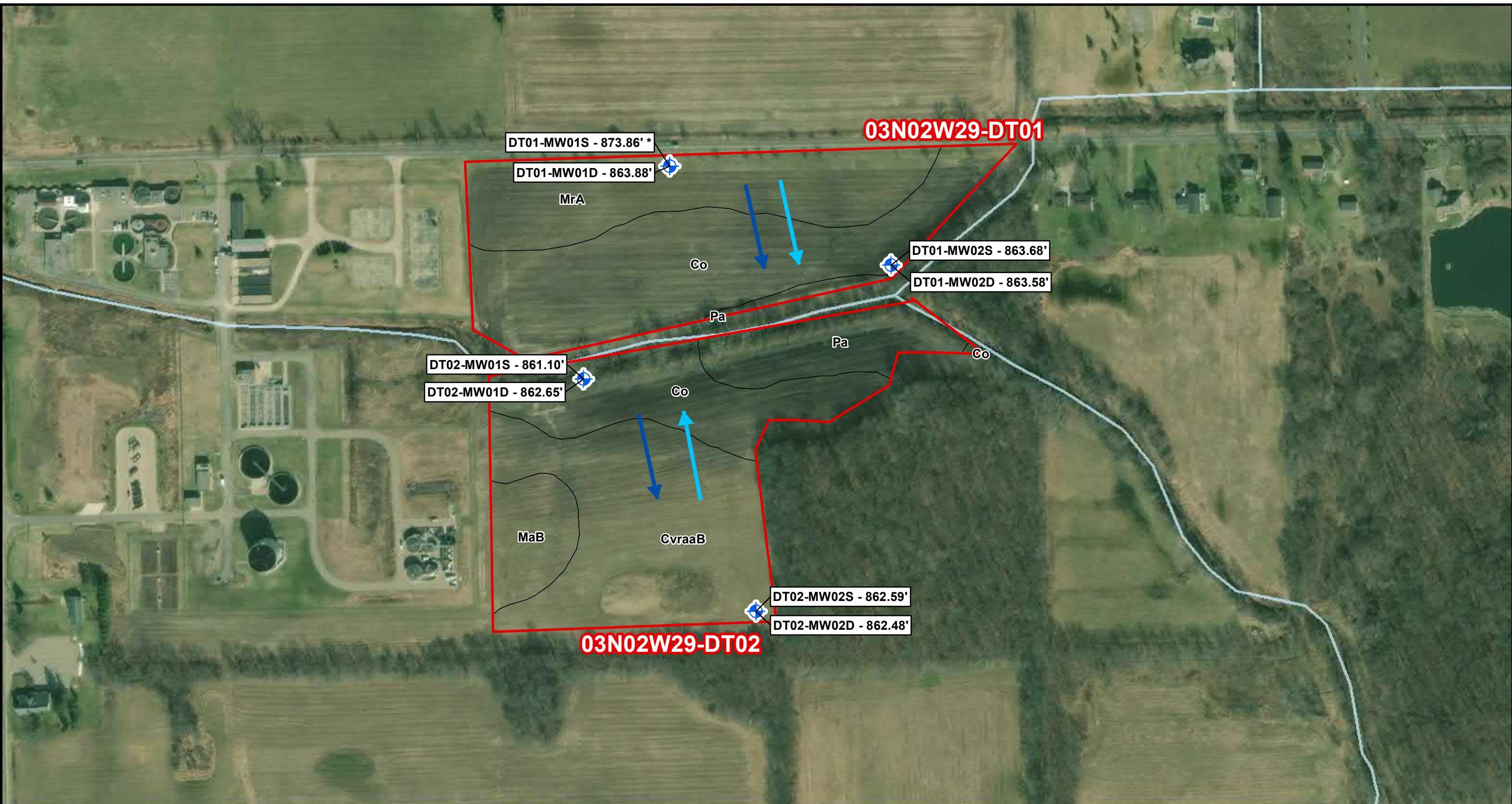
0 100 200 300 400 500

N

**FIGURE 5**  
**03N02W29-DT01 & DT02**  
**GROUNDWATER SAMPLING RESULTS**

DELHI, MI

1,000  
Feet



**AECOM**

Drawn: JS Date: 3/9/2020

Approved: DB Date: 3/9/2020

Project #:



**Legend**

● Monitoring Well Sample

■ Biosolids Application Field

□ Soil Type

→ Estimated Shallow GW Flow Direction

→ Estimated Deep GW Flow Direction

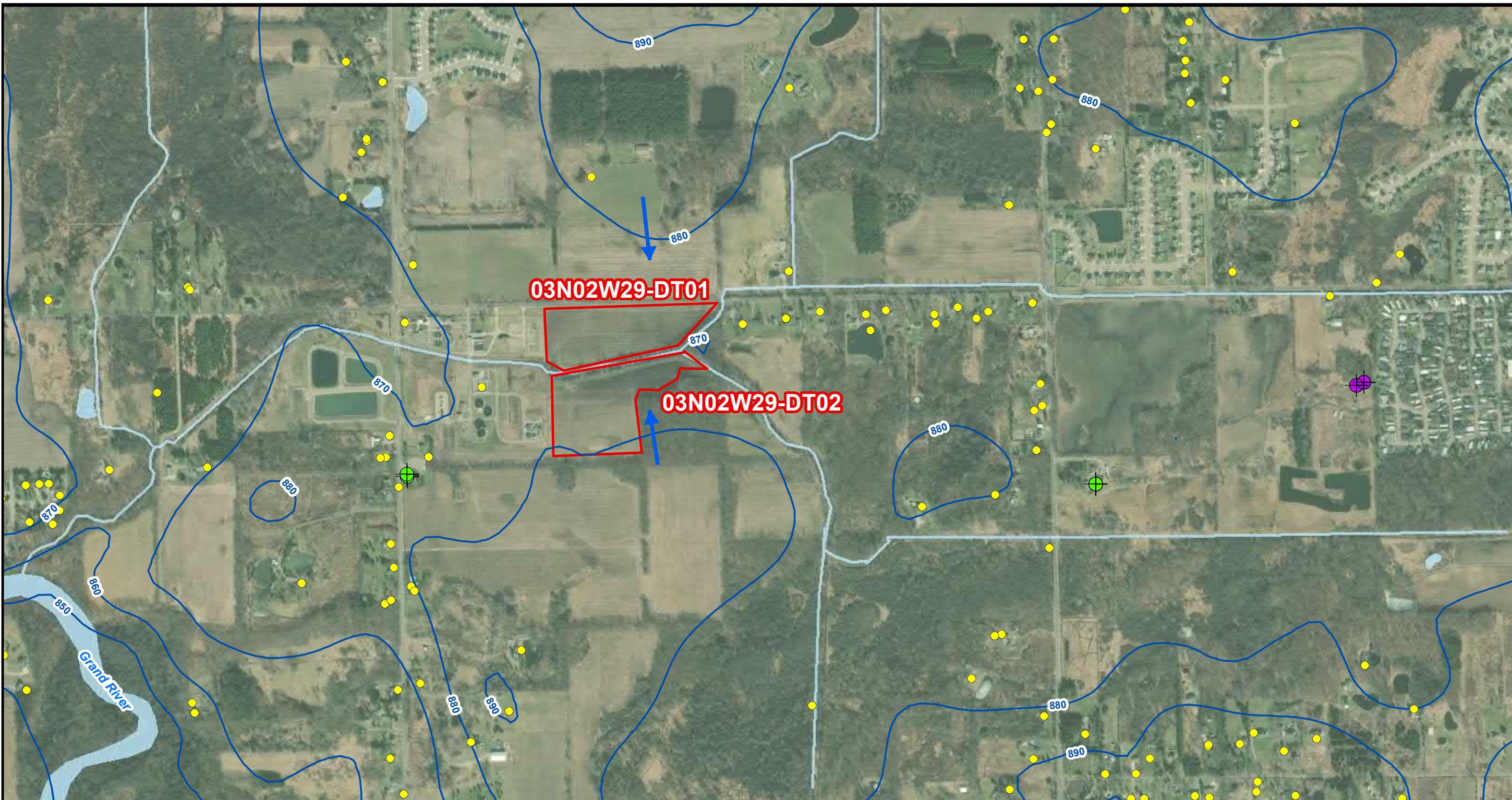
\* = Perched Elevation

Note: All Groundwater Elevations are Estimated Using  
Measured Depth to Water From DEM Ground Elevation

0 100 200 300 400 500 1,000  
Feet



**FIGURE 6**  
**03N02W29-DT01 & DT02**  
**LOCAL GROUNDWATER CONTOURS**  
DELHI, MI



**AECOM**

Drawn: JS Date: 3/9/2020

Approved: DB Date: 3/9/2020

Project #:



#### Legend

- Wellogic Water Wells
- Biosolids Application Field
- Wellogic Type I Wells
- Approximate GW Flow Direction
- Wellogic Type II Wells

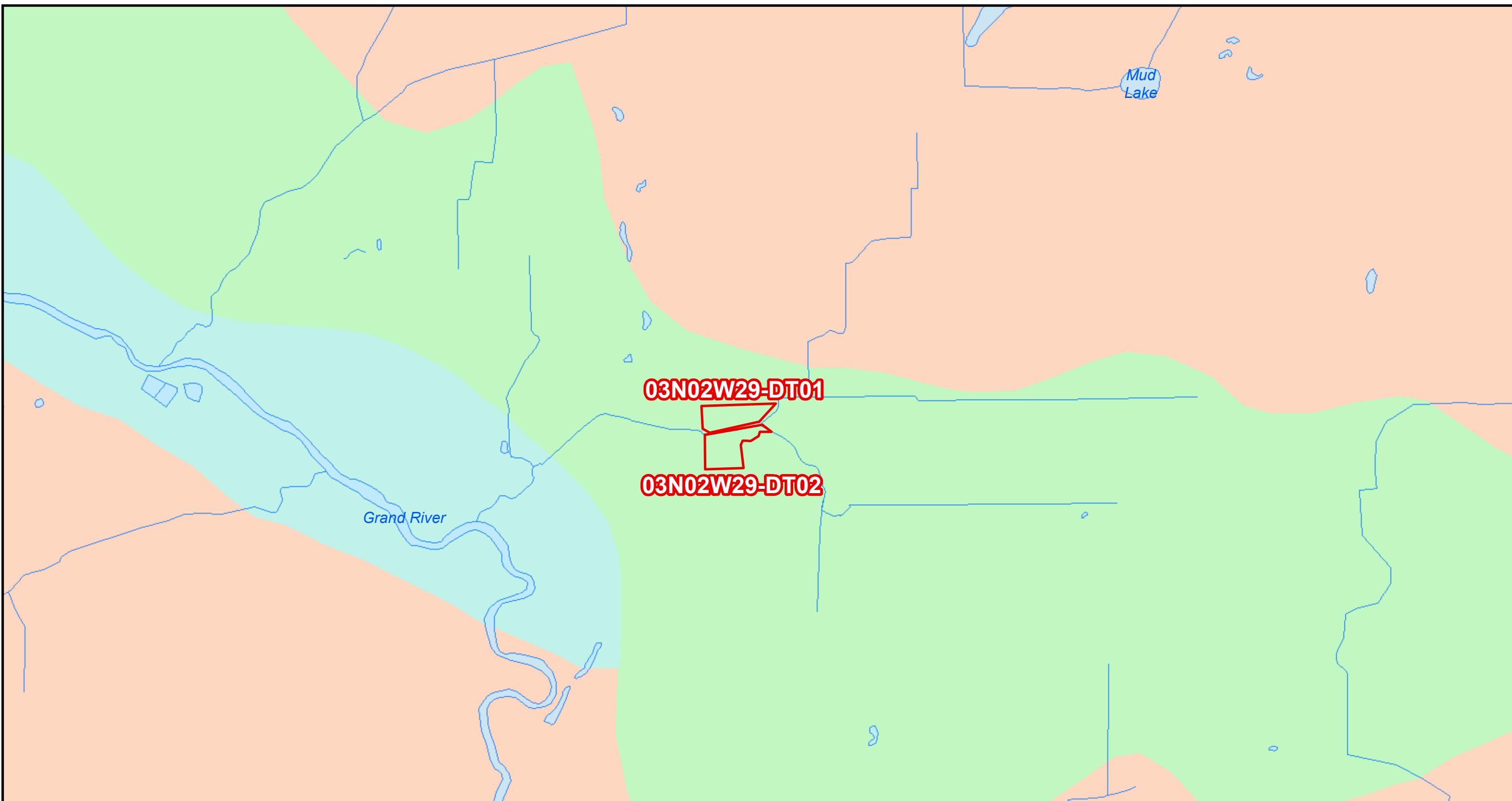
0 400 800 1,200 1,600 2,000

4,000  
Feet



**FIGURE 7**  
**03N02W29-DT01 & DT02**  
**POTENTIAL RECEPTORS**

DELHI, MI



**AECOM**

Drawn: JS Date: 3/9/2020

Approved: DB Date: 3/9/2020

Project #:



#### Legend

##### Glacial Geology

- Coarse-textured glacial till
- Dune sand
- End moraines of coarse-textured till
- End moraines of fine-textured till
- End moraines of medium-textured till
- Fine-textured glacial till

Glacial outwash sand and gravel and postglacial alluvium

Lacustrine clay and silt

Lacustrine sand and gravel

Medium-textured glacial till

Water

Biosolids Application Field



**FIGURE 8**  
**03N02W29-DT01 & DT02**  
**REGIONAL GLACIAL GEOLOGY**

DELHI, MI

# Tables

**Table 1**  
**Parcel ID: 03N02W29-DT01, 03N02W29-DT02**  
**Biosolids Application Data**

| Year                   | Site ID       | Dry Ton Land Applied | Acres Used                                       | Acres Approved | Dry Tons /Acre | Dates               | Notes                               |
|------------------------|---------------|----------------------|--|----------------|----------------|---------------------|-------------------------------------|
| 2018                   | 03N02W29-DT01 | 27.9                 | 12.3   | 12.3           | 2.27           | 12/3-12/4/2017      |                                     |
| 2016                   | 03N02W29-DT01 | 17.4                 | 5.4  | 12.3           | 3.23           | 6/9/2016            | Site originally was DE01            |
| 2012                   | 03N02W29-DT01 | 56.1                 | 11   | 12.3           | 2.1; 18.6      | 9/7/2012; 4/10/2012 | Site originally was DE01, two hauls |
| 2010                   | 03N02W29-DT01 | 32.3                 | 10   | 10             | 3.23           | 7/26/2010           | Site originally was DE01            |
| 2006                   | 03N02W29-DT01 | 51                   | 13   | 13             | 3.92           | 4/19/2006-4/20/2006 | Site originally was DE01            |
| 2003                   | 03N02W29-DT01 | 38.76                | 13   | 13             | 3.095          | 5/25-5/26/2003      | Site originally was DE01            |
| 2001                   | 03N02W29-DT01 | 42.25                | 13   | 13             | 3.25           | 9/7/2001            | Site originally was DE01            |
| <b>Total dry tons:</b> |               | <b>265.71</b>        | <b>Average application rate (dry tons/acre):</b> |                | <b>4.96</b>    |                     |                                     |
| 2018                   | 03N02W29-DT02 | 21.3                 | 10   | 16.2           | 2.13           | 12/4/2017           |                                     |
| 2011                   | 03N02W29-DT02 | 228                  | 14   | 16.2           | 16.26          | 9/17-9/18/2011      |                                     |
| 2010                   | 03N02W29-DT02 | 34                   | 11   | 17             | 3.1            | 8/2/2010            |                                     |
| 2006                   | 03N02W29-DT02 | 52.5                 | 14.1   | 21             | 3.72           | 4/18-4/19/2006      |                                     |
| 2003                   | 03N02W29-DT02 | 49.62                | 20   | 21             | 2.51           | 5/27-5/28/2003      |                                     |
| <b>Total dry tons:</b> |               | <b>385.42</b>        | <b>Average application rate (dry tons/acre):</b> |                | <b>5.54</b>    |                     |                                     |

**Table 2**  
 Parcel ID: 03N02W29-DT01, 03N02W29-DT02  
 Soil PFAS Analytical Results Summary

| Soil Sample ID    | Sample Date | Field Site | Total PFAS | PFBA    | PPeA    | PFHxA   | PFHpA   | PFOA    | PFNA    | PFDA    | PFUnDA  | PFDoDA  | PFTrDA  | PFTeDA  | PFBS    | PPeS    | PFHxS | PFHpS  | PFOS    | PFNS    | PFDS    | FOSA    | 4:2 FTSA | 6:2 FTSA | 8:2 FTSA | EtFOSAA | MeFOSAA | TOC |
|-------------------|-------------|------------|------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|--------|---------|---------|---------|---------|----------|----------|----------|---------|---------|-----|
| SXDU11904091050MK | 4/9/2019    | DT01-DU01  | 1.82       | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | 1.82  | < 1.48 | < 0.986 | < 0.986 | < 0.986 | < 0.986 | < 0.986  | < 0.986  | < 0.986  | 18,000  |         |     |
| SXDU21904091155MK | 4/9/2019    | DT01-DU02  | 14.82      | < 0.991 | < 0.991 | < 0.991 | < 0.991 | < 0.991 | < 0.991 | 2.98    | < 0.991 | 1.29    | < 0.991 | < 0.991 | < 0.991 | < 0.991 | 8.98  | < 1.49 | < 0.991 | < 0.991 | < 0.991 | < 0.991 | < 0.991  | < 0.991  | < 0.991  | 1.57    | 18,000  |     |
| SXDU11904091350MK | 4/9/2019    | DT02-DU01  | 2.84       | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | 2.84  | < 1.47 | < 0.979 | < 0.979 | < 0.979 | < 0.979 | < 0.979  | < 0.979  | < 0.979  | 100,000 |         |     |
| SXDU21904091300MK | 4/9/2019    | DT02-DU02  | 8.23       | < 0.965 | < 0.965 | < 0.965 | < 0.965 | 1.52    | < 0.965 | 1.35    | < 0.965 | < 0.965 | < 0.965 | < 0.965 | < 0.965 | < 0.965 | 5.36  | < 1.45 | < 0.965 | < 0.965 | < 0.965 | < 0.965 | < 0.965  | < 0.965  | < 0.965  | 17,000  |         |     |

TOC = Total Organic Carbon

Soil concentrations are reported as ug/Kg or parts per billion (ppb)

TOC concentrations are reported as mg/Kg or parts per million (ppm)

**Bolded values indicate detection**

|  |
|--|
| Perfluoroalkyl Carboxylic Acids (PFCAs)                      |
| Perfluoroalkane Sulfonic Acids (PFSAs)                       |
| Perfluoroalkane Sulfonamides (FASAs)                         |
| Fluorotelomer Sulfonic Acids (FTSAs)                         |
| N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (EtFASAAAs)  |
| N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (MeFASAAAs) |

PFBA = Perfluorobutanoic acid

PPeA = Perfluoropentanoic acid

PFHxA = Perfluorohexanoic acid

PFHpA = Perfluoroheptanoic acid

PFOA = Perfluoroctanoic acid

PFNA = Perfluorononanoic acid

PFDA = Perfluorodecanoic acid

PFUnDA = Perfluoroundecanoic acid

PFDoDA = Perfluorododecanoic acid

PFTrDA = Perfluorotridecanoic acid

PFTeDA = Perfluorotetradecanoic acid

PFBS = Perfluorooctane sulfonic acid

PPeS = Perfluorooctane sulfonic acid

PFHxS = Perfluorohexane sulfonic acid

PFHpS = Perfluoroheptane sulfonic acid

PFOS = Perfluoroctane sulfonic acid

PFNS = Perfluorodecane sulfonic acid

PFDS = Perfluorooctane sulfonic acid

FOSA = Perfluoroctane sulfonamide

4:2 FTSA = 4:2 Fluorotelomer sulfonic acid

6:2 FTSA = 4:2 Fluorotelomer sulfonic acid

8:2 FTSA = 4:2 Fluorotelomer sulfonic acid

EtFOSAA = N-Ethyl perfluoroctane sulfonamidoacetic acid

MeFOSAA = N-Methyl perfluoroctane sulfonamidoacetic acid

**Table 3**  
 Parcel ID: 03N02W29-DT01, 03N02W29-DT02  
 Surface Water PFAS Analytical Results Summary

| Surface Water Sample ID | Sample Date | Field Site   | Total PFAS | PFBA | PPPeA  | PFHxA  | PFHpA  | PFOA   | PFNA   | PFDA   | PFUnDA | PFDoDA | PFTrDA | PFTeDA | PFBS   | PPPeS  | PFHxS  | PFHpS  | PFOS   | PFNS   | PFDS   | FOSA   | 4:2 FTSA | 6:2 FTSA | 8:2 FTSA | EtFOSAA | MeFOSAA |
|-------------------------|-------------|--------------|------------|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|----------|----------|----------|---------|---------|
| SW011904091015RL        | 4/9/2019    | DT01-02-SW01 | 18.36      | 3.32 | 2.76   | 2.74   | < 2.25 | 2.87   | < 2.25 | < 2.25 | < 2.25 | < 2.25 | < 2.25 | 4.55   | < 2.25 | 2.12   | < 2.25 | < 2.25 | < 2.25 | < 2.25 | < 2.25 | < 2.25 | < 2.25   | < 2.25   | < 2.25   | < 2.25  |         |
| SW031904091125RL        | 4/9/2019    | DT01-02-SW03 | 9.71       | 3.37 | 1.54   | 1.55   | < 2.10 | 1.59   | < 2.10 | < 2.10 | < 2.10 | < 2.10 | < 2.10 | 1.66   | < 2.10 | < 2.10 | < 2.10 | < 2.10 | < 2.10 | < 2.10 | < 2.10 | < 2.10 | < 2.10   | < 2.10   | < 2.10   | < 2.10  |         |
| SW041904091255RL        | 4/9/2019    | DT01-SW04    | 4.44       | 1.65 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | 2.79   | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20 | < 2.20   | < 2.20   | < 2.20   |         |         |

All values are in nanograms per liter (**ng/L**) or parts per trillion (**ppt**)

"<" = Values Below Detection Limit (**DL**)

**Bolded values indicate detection**

Perfluoroalkyl Carboxylic Acids (**PFCAAs**)

Perfluoroalkane Sulfonic Acids (**PFSAAs**)

Perfluoroalkane Sulfonamides (**FASAs**)

Fluorotelomer Sulfonic Acids (**FTSAAs**)

N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (**EtFASAAAs**)

N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (**MeFASAAAs**)

PFBA = Perfluorobutanoic acid

PPPeA = Perfluoropentanoic acid

PFHxA = Perfluorohexanoic acid

PFHpA = Perfluoroheptanoic acid

PFOA = Perfluorooctanoic acid

PFNA = Perfluorononanoic acid

PFDA = Perfluorodecanoic acid

PFUnDA = Perfluoroundecanoic acid

PFDoDA = Perfluorododecanoic acid

PFTrDA = Perfluorotridecanoic acid

PFTeDA = Perfluorotetradecanoic acid

PFBS = Perfluorobutane sulfonic acid

PPPeS = Perfluoropentane sulfonic acid

PFHxS = Perfluorohexane sulfonic acid

PFHpS = Perfluoroheptane sulfonic acid

PFOS = Perfluorooctane sulfonic acid

PFNS = Perfluorononane sulfonic acid

PFDS = Perfluorodecane sulfonic acid

FOSA = Perfluoroctane sulfonamide

4:2 FTSA = 4:2 Fluorotelomer sulfonic acid

6:2 FTSA = 4:2 Fluorotelomer sulfonic acid

8:2 FTSA = 4:2 Fluorotelomer sulfonic acid

EtFOSAA = N-Ethyl perfluoroctane sulfonamidoacetic acid

MeFOSAA = N-Methyl perfluoroctane sulfonamidoacetic acid

**Rule 57 Water Quality Standards (WQS) (ng/L)**

|  | PFOA       | PFOS      |
|--|------------|-----------|
| Human Noncancer Value (HNV)<br>(non-drinking water source) | 12,000     | 12        |
| Final Chronic Value (FCV)                                  | 880,000    | 140,000   |
| Final Acute Value (FAV)                                    | 15,000,000 | 1,600,000 |
| Aquatic Maximum Value (AMV)                                | 7,700,000  | 780,000   |



Concentration exceeds Rule 57 WQS: HNV



Concentration exceeds Rule 57 WQS: FCV and HNV



Concentration exceeds Rule 57 WQS: FAV, FCV and HNV



Concentration exceeds Rule 57 WQS: AMV, FAV, FCV and HNV

**Table 4**  
 Parcel ID: 03N02W29-DT01, 03N02W29-DT02  
 Groundwater PFAS Analytical Results Summary

| Groundwater Sample ID | Sample Date | Field Site | Total PFAS   | PFBA        | PPPeA       | PFHxA       | PFHpA       | PFOA        | PFNA   | PFDA   | PFUnDA | PFDoDA | PFTrDA | PFTeDA      | PFBS   | PPPeS       | PFHxS  | PFHpS       | PFOS   | PFNS   | PFDS   | FOSA   | 4:2 FTSA | 6:2 FTSA | 8:2 FTSA | EtFOSAA | MeFOSAA |
|-----------------------|-------------|------------|--------------|-------------|-------------|-------------|-------------|-------------|--------|--------|--------|--------|--------|-------------|--------|-------------|--------|-------------|--------|--------|--------|--------|----------|----------|----------|---------|---------|
| GW2001131025RAP       | 1/13/2020   | DT01-MW01S | <b>21.39</b> | <b>1.88</b> | <b>1.94</b> | <b>1.89</b> | < 1.98      | <b>3.00</b> | < 1.98 | < 1.98 | < 1.98 | < 1.98 | < 1.98 | <b>9.82</b> | < 1.98 | <b>1.36</b> | < 1.98 | <b>1.50</b> | < 1.98 | < 1.98 | < 1.98 | < 1.98 | < 1.98   | < 1.98   | < 1.98   | < 1.98  |         |
| GW2001131155RAP       | 1/13/2020   | DT01-MW01D | < 2.00       | < 2.00      | < 2.00      | < 2.00      | < 2.00      | < 2.00      | < 2.00 | < 2.00 | < 2.00 | < 2.00 | < 2.00 | < 2.00      | < 2.00 | < 2.00      | < 2.00 | < 2.00      | < 2.00 | < 2.00 | < 2.00 | < 2.00 | < 2.00   | < 2.00   | < 2.00   |         |         |
| GW2001131320RAP       | 1/13/2020   | DT01-MW02S | <b>20.2</b>  | <b>6.81</b> | < 2.03      | < 2.03      | < 2.03      | < 2.03      | < 2.03 | < 2.03 | < 2.03 | < 2.03 | < 2.03 | <b>13.4</b> | < 2.03 | < 2.03      | < 2.03 | < 2.03      | < 2.03 | < 2.03 | < 2.03 | < 2.03 | < 2.03   | < 2.03   | < 2.03   |         |         |
| GW2001131320RAP-FD    | 1/13/2020   | DT01-MW02S | <b>20.4</b>  | <b>6.60</b> | < 1.99      | < 1.99      | < 1.99      | < 1.99      | < 1.99 | < 1.99 | < 1.99 | < 1.99 | < 1.99 | <b>13.8</b> | < 1.99 | < 1.99      | < 1.99 | < 1.99      | < 1.99 | < 1.99 | < 1.99 | < 1.99 | < 1.99   | < 1.99   | < 1.99   |         |         |
| GW2001131435RAP       | 1/13/2020   | DT01-MW02D | < 2.02       | < 2.02      | < 2.02      | < 2.02      | < 2.02      | < 2.02      | < 2.02 | < 2.02 | < 2.02 | < 2.02 | < 2.02 | < 2.02      | < 2.02 | < 2.02      | < 2.02 | < 2.02      | < 2.02 | < 2.02 | < 2.02 | < 2.02 | < 2.02   | < 2.02   | < 2.02   |         |         |
| GW2001141055RAP       | 1/14/2020   | DT02-MW01S | <b>96.8</b>  | <b>6.10</b> | <b>7.67</b> | <b>11.6</b> | <b>3.68</b> | <b>5.65</b> | < 2.12 | < 2.12 | < 2.12 | < 2.12 | < 2.12 | <b>62.1</b> | < 2.12 | < 2.12      | < 2.12 | < 2.12      | < 2.12 | < 2.12 | < 2.12 | < 2.12 | < 2.12   | < 2.12   | < 2.12   |         |         |
| GW2001141210RAP       | 1/14/2020   | DT02-MW01D | <b>2.22</b>  | <b>2.22</b> | < 1.96      | < 1.96      | < 1.96      | < 1.96      | < 1.96 | < 1.96 | < 1.96 | < 1.96 | < 1.96 | < 1.96      | < 1.96 | < 1.96      | < 1.96 | < 1.96      | < 1.96 | < 1.96 | < 1.96 | < 1.96 | < 1.96   | < 1.96   | < 1.96   |         |         |
| GW2001131535RAP       | 1/13/2020   | DT02-MW02S | <b>2.67</b>  | < 1.98      | < 1.98      | < 1.98      | < 1.98      | < 1.98      | < 1.98 | < 1.98 | < 1.98 | < 1.98 | < 1.98 | <b>2.67</b> | < 1.98 | < 1.98      | < 1.98 | < 1.98      | < 1.98 | < 1.98 | < 1.98 | < 1.98 | < 1.98   | < 1.98   | < 1.98   |         |         |
| GW2001131620RAP       | 1/13/2020   | DT02-MW02D | <b>7.72</b>  | <b>3.45</b> | < 2.00      | < 2.00      | < 2.00      | < 2.00      | < 2.00 | < 2.00 | < 2.00 | < 2.00 | < 2.00 | <b>4.27</b> | < 2.00 | < 2.00      | < 2.00 | < 2.00      | < 2.00 | < 2.00 | < 2.00 | < 2.00 | < 2.00   | < 2.00   | < 2.00   |         |         |

All values are in nanograms per liter (**ng/L**) or parts per trillion (**ppt**)

"<" = Values Below Detection Limit (**DL**)

**Bolded** values indicate detection

**EGLE Part 201 Drinking Water Criteria (DWC) (ng/L)**

PFOA = 8; PFOS = 16; PFNA = 6; PFHxS=51

PFHxA = 400,000; PFBS = 420

**EGLE Part 201 Groundwater Surfacewater Interface (GSI) Criteria (ng/L)**

(Surface water not used for drinking water - Non-drink)

PFOA = 12,000

PFOS = 12

Perfluoroalkyl Carboxylic Acids (**PFCA**s)

Perfluoroalkane Sulfonic Acids (**PFSA**s)

Perfluoroalkane Sulfonamides (**FAS**A)s)

Fluorotelomer Sulfonic Acids (**FTSA**s)

N-Ethyl Perfluoroalkane Sulfonamidoacetic Acids (**EtFASAA**s)

N-Methyl Perfluoroalkane Sulfonamidoacetic Acids (**MeFASAA**s)

PFBA = Perfluorobutanoic acid

PPPeA = Perfluoropentanoic acid

PFHxA = Perfluorohexanoic acid

PFDoDA = Perfluorododecanoic acid

PFHpA = Perfluoroheptanoic acid

PFTrDA = Perfluorotridecanoic acid

PFTeDA = Perfluorotetradecanoic acid

PFNA = Perfluorooctanoic acid

PFBS = Perfluorobutane sulfonic acid

PFDA = Perfluorodecanoic acid

PFUnDA = Perfluoroundecanoic acid

PFHxS = Perfluorohexane sulfonic acid

PFDoDA = Perfluorododecanoic acid

PFHpS = Perfluoroheptane sulfonic acid

PFTrDA = Perfluorooctane sulfonic acid

PFTeDA = Perfluorotetradecanoic acid

PFNS = Perfluorononane sulfonic acid

PFDS = Perfluorodecane sulfonic acid

FOSA = Perfluoroctane sulfonamide

4:2 FTSA = 4:2 Fluorotelomer sulfonic acid

6:2 FTSA = 4:2 Fluorotelomer sulfonic acid

8:2 FTSA = 4:2 Fluorotelomer sulfonic acid

EtFOSAA = N-Ethyl perfluoroctane sulfonamidoacetic acid

MeFOSAA = N-Methyl perfluoroctane sulfonamidoacetic acid

# Concentration exceeds DWC criteria

# Concentration exceeds GSI criteria

# Concentration exceeds both DWC and GSI criteria

**Table 5**  
 Parcel ID: 03N02W29-DT01, 03N02W29-DT02  
 Stabilized Water Quality Parameters

| Groundwater Monitoring Well ID | Field Site | DTW   | Total PFAS<br>(ft) | Lithology Top Screen                          | Lithology Bottom Screen               | Sample Screen Interval | pH   | Conductivity | Turbidity | D.O. | Temperature | ORP   |
|--------------------------------|------------|-------|--------------------|---|---------------------------------------|------------------------|------|--------------|-----------|------|-------------|-------|
|                                |            | (ft)  |                    |   |                                       | (ft bgs)               | SU   | uS/cm        | NTU       | mg/L | °C          | mV    |
| GW2001131025RAP                | DT01-MW01S | 3.52  | <b>21.39</b>       | top 4' fine-med sand w gravel                 | bottom 1' lean clay                   | 2-7                    | 7.35 | 0.376        | 2.80      | 7.73 | 4.1         | 341.0 |
| GW2001131155RAP                | DT01-MW01D | 13.50 | < 2.00             | silty fine sand                               | medium sand w gravel                  | 20-25                  | 7.28 | 0.568        | 26.03     | 0.13 | 9.6         | -87.5 |
| GW2001131320RAP                | DT01-MW02S | 6.68  | <b>20.2</b>        | top 3' fat clay w gravel                      | bottom 2' medium sand                 | 6.5-11.5               | 6.95 | 1.336        | 5.69      | 2.48 | 6.3         | 189.2 |
| GW2001131435RAP                | DT01-MW02D | 6.41  | < 2.02             | fine sand w silt                              | med sand w silt w gravel              | 20-25                  | 7.23 | 0.649        | 18.41     | 0.09 | 9.4         | -87.6 |
| GW2001141055RAP                | DT02-MW01S | 3.41  | <b>96.8</b>        | fine sand w silt, organic sand silt, med sand | fat clay, med sand w gravel, fat clay | 2-7                    | 7.09 | 0.459        | 2.25      | 4.55 | 5.2         | 230.1 |
| GW2001141210RAP                | DT02-MW01D | 4.79  | 2.22               | fine gravel w sand                            | fine gravel w sand                    | 12-17                  | 7.22 | 0.665        | 26.91     | 0.18 | 9.5         | -73.8 |
| GW2001131535RAP                | DT02-MW02S | 18.41 | 2.67               | well sorted fine sand                         | well sorted fine sand                 | 15-20                  | 7.21 | 0.660        | 3.05      | 0.12 | 8.1         | -63.1 |
| GW2001131620RAP                | DT02-MW02D | 18.41 | 7.72               | well sorted fine sand                         | well sorted fine sand                 | 35-40                  | 7.15 | 0.592        | 6.33      | 0.09 | 9.0         | -82.0 |

ft = Feet

bgs = Below ground surface

SU = Standard Unit

uS/cm = Microseimens/centimeter

NTU = Nephelometric Turbidity Units

mg/L = Milligrams/Liter

°C = Degree Celcius

mV = Millivolt

DTW = Depth to water (from top of well casing)

GW = Groundwater

D.O. = Dissolved Oxygen

ORP = Oxidation-Reduction Potential

**Table 6**  
**Parcel ID: 03N02W29-DT01, 03N02W29-DT02**  
**PFAS and TOC Soil Analytical Results Summary**

| Soil Sample ID    | Sample Date | Field Site | Depth (ft bgs) | Total PFAS | Total TOC | Soil Survey | Soil Survey Description   |
|-------------------|-------------|------------|----------------|------------|-----------|-------------|---|
| SXDU11904091050MK | 4/9/2019    | DT01-DU01  | 0.7            | 1.82       | 18,000    | Co          | Colwood-Brookston loams, Landform: Lake plains, Parent material: Stratified sandy and/or silty and/or loamy glaciolacustrine deposits   |
| SXDU21904091155MK | 4/9/2019    | DT01-DU02  | 0.7            | 14.82      | 18,000    | MrA         | Matherton sandy loam, Landform: Outwash plains, Parent material: Loamy over loamy and/or sandy outwash; loamy over sandy and gravelly glaciofluvial deposits  |
| SXDU11904091350MK | 4/9/2019    | DT02-DU01  | 0.7            | 2.84       | 100,000   | Pa          | Palms muck, Landform: Drainageways on moraines, drainageways on outwash plains, drainageways on till plains, depressions on outwash plains, depressions on till plains, swamps on moraines, swamps on outwash plains, swamps on till plains, depressions on moraines, Parent material: Herbaceous organic material over loamy drift |
| SXDU21904091300MK | 4/9/2019    | DT02-DU02  | 0.7            | 8.23       | 17,000    | CvraaB      | Conover loam, Landform: Ground moraines, end moraines, Parent material: Loamy till over dense loamy till  |

ft bgs = Feet below ground surface

ND = Non Detect

TOC = Total Organic Carbon

PFAS soil concentrations are reported as ug/Kg or ppb

TOC concentrations reported as mg/Kg or ppm

MrA = Matherton sandy loam

Co = Colwood-Brookston loams

Pa = Palms muck

CvraaB = Conover loam

# Appendix A



## FIELD BOREHOLE LOG

BOREHOLE NO: DT01-MW1  
TOTAL DEPTH: 44.5 FT

| PROJECT INFORMATION |  |                                    |         |          | DRILLING INFORMATION |      |  |  |  |
|---------------------|--|------------------------------------|---------|----------|----------------------|------|--|--|--|
| PROJECT:            |  | Statewide WWTP Biosolids PFAS Eval |         |          | CONTRACTOR:          |      | Mateco   |  |  |
| SITE LOCATION:      |  | McCue Rd, Delhi, MI                |         |          | CREW CHIEF:          |      | Mitch Slachter   |  |  |
| PROJECT NO.:        |  | 60588767                           |         |          | DRILL RIG TYPE:      |      | Geoprobe 7822  |  |  |
| PROJECT MANAGER:    |  | Matt Vander Eide                   |         |          | DRILLING METHOD:     |      | Direct Push  |  |  |
| LOGGED BY:          |  | Kelly Moss                         |         |          | HOLE DIAMETER:       |      | 2 1/4"   |  |  |
| CREATED BY:         |  | Kaitlyn Eicholtz                   |         |          | DATE START:          |      | 12/9/19 13:15  |  |  |
| DEPTH               |  | SAMPLE TYPE                        | ATTEMPT | RECOVERY | SOIL SYMBOLS         | USCS | SOIL DESCRIPTION   |  |  |
| 0                   |  | DIRECT PUSH                        |         |          | OL                   |      | OL: 10YR2/2 POORLY SORTED GRAVELLY ORGANIC SILT WITH SAND, non plastic, sub rounded sand grains and sub angular gravel, 10% clay, 50% silt, 10% fine sand, 5% medium sand, 15% fine gravel, 10% coarse gravel, organic silt, moist                                 |  |  |
|                     |  |                                    |         |          | SM                   |      | SM: 10YR4/4 POORLY SORTED SILTY MEDIUM SAND WITH GRAVEL, non plastic, sub rounded sand grains and sub angular gravel, 5% clay, 30% silt, 10% fine sand, 25% medium sand, 10% coarse sand, 10 fine gravel, 10% coarse gravel, moist                                 |  |  |
|                     |  |                                    |         |          | SM                   |      | SM: 10YR4/4 POORLY SORTED SILTY MEDIUM SAND WITH GRAVEL, non plastic, sub rounded sand grains and sub angular gravel, trace clay, 15% silt, 10% fine sand, 40% medium sand, 10% coarse sand, 10 fine gravel, 15% coarse gravel, average gravel 10mm to 25mm, moist |  |  |
| 5                   |  | DIRECT PUSH                        |         |          | SM                   |      | SM: 10YR4/4 POORLY SORTED SILTY FINE SAND WITH GRAVEL, non plastic, sub rounded sand grains and sub angular gravel, 10% clay, 20% silt, 30% fine sand, 15% medium sand, 10% coarse sand, 5% fine gravel, 10% coarse gravel   |  |  |
|                     |  |                                    |         |          | CL                   |      | CL: 10YR5/3 LEAN CLAY, low plasticity, sub rounded sand grains, 50% clay, 40% silt, 10% fine sand, trace medium sand, cohesive   |  |  |
| 10                  |  | DIRECT PUSH                        |         |          | CH                   |      | CH: 10YR4/2 FAT CLAY, high plasticity, sub rounded sand grains, 70% clay, 20% silt, trace fine sand, 10% fine gravel, very stiff, cohesive, penetrometer 3.0tsf  |  |  |
|                     |  |                                    |         |          |                      |      |  |  |  |

| FIELD BOREHOLE LOG |             |         |          |              |      | BOREHOLE NO:<br><b>DT01-MW1</b>   | WELL CONSTRUCTION |
|--------------------|-------------|---------|----------|--------------|------|---|-------------------|
| DEPTH              | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION  |                   |
|                    | DIRECT PUSH |         |          |              | CH   | CH: 10YR4/2 FAT CLAY, high plasticity, sub rounded sand grains and sub angular gravel, 70% clay, 20% silt, 10% fine gravel, very stiff, cohesive, penetrometer 2.75tsf  |                   |
|                    |             |         |          |              | CH   | CH: 10YR4/2 FAT CLAY WITH SAND, high plasticity, sub rounded sand grains and sub angular gravel, 50% clay, 25% silt, 5% fine sand, 20% medium sand, trace fine gravel, cohesive, stiff, with 10YR5/4 medium sand seam, penetrometer 1.75tsf |                   |
| 15                 |             |         |          |              | CH   | CH: 10YR4/2 FAT CLAY, high plasticity, sub rounded sand grains and sub angular gravel, 65% clay, 20% silt, 5% fine sand, 10% fine gravel, penetrometer 1.75tsf  |                   |
| 15.0               | DIRECT PUSH |         |          |              | SM   | SM: 10YR4/2 WELL SORTED SILTY FINE SAND, non plastic, sub rounded sand grains, trace clay, 15% silt, 50% fine sand, 35% medium sand, uniform, very dense, wet, with few silt lenses   |                   |
| 20                 |             |         |          |              | SM   | SM: 10YR4/2 WELL SORTED SILTY FINE SAND, non plastic, sub rounded sand grains, 5% clay, 15% silt, 50% fine sand, 30% medium sand, uniform, wet  |                   |
|                    |             |         |          |              |      |   | DT01-MW1D         |
|                    |             |         |          |              |      |   | 2" PVC            |
|                    |             |         |          |              |      |   | Sand Pack         |
|                    |             |         |          |              |      |   | Screen            |

| FIELD BOREHOLE LOG |             |         |          |              |      | BOREHOLE NO:<br><b>DT01-MW1</b>  | WELL CONSTRUCTION              |
|--------------------|-------------|---------|----------|--------------|------|--|--------------------------------|
| DEPTH              | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION   | TOTAL DEPTH:<br><b>44.5 FT</b> |
|                    | DIRECT PUSH |         |          |              |      |  |                                |
| 25                 | DIRECT PUSH |         |          |              | SM   | SM: 10YR4/2 POORLY SORTED SILTY MEDIUM SAND WITH GRAVEL, non plastic, sub rounded sand grains and angular gravel, 10% clay, 15% silt, 15% fine sand, 35% medium sand, trace coarse sand, 10% fine gravel, 15% coarse gravel, average gravel 10mm to 20mm, wet            | -23                            |
|                    |             |         |          |              | GM   | GM: 10YR4/2 POORLY SORTED SILTY GRAVEL WITH SAND, non plastic, sub rounded sand grains and sub angular gravel, 10% clay, 35% silt, 10% fine sand, 10% medium sand, trace coarse sand, 15% fine gravel, 20% coarse gravel, hard, penetrometer 4.5tsf                      | -24                            |
|                    |             |         |          |              | SM   | SM: 10YR4/2 POORLY SORTED SILTY FINE SAND, non plastic, sub rounded sand grains and sub angular gravel, 20% clay, 20% silt, 40% fine sand, 10% medium sand, trace coarse sand, 10% fine gravel, wet  | -25                            |
|                    |             |         |          |              | ML   | ML: 10YR4/2 POORLY SORTED SILT WITH GRAVEL, non plastic, sub rounded sand grains and sub angular gravel, 10% clay, 35% silt, 10% fine sand, 10% medium sand, trace coarse sand, 15% fine gravel, 20% coarse gravel, average gravel 20mm, very hard, penetrometer 4.5+tsf | -26                            |
| 30                 | DIRECT PUSH |         |          |              | ML   | ML: 10YR4/2 POORLY SORTED GRAVELLY SILT, low plasticity, sub rounded sand grains and sub angular to angular gravel, 30% clay, 35% silt, 15% fine sand, 20% fine gravel, very hard, penetrometer 4.5+tsf  | -27                            |
|                    |             |         |          |              |      |  | -28                            |
|                    |             |         |          |              |      |  | -29                            |
|                    |             |         |          |              |      |  | -30                            |
|                    |             |         |          |              |      |  | -31                            |
|                    |             |         |          |              |      |  | -32                            |
|                    |             |         |          |              |      |  | -33                            |
|                    |             |         |          |              |      |  | -34                            |
|                    |             |         |          |              |      |  |                                |

The diagram illustrates the well construction profile. The borehole extends from -23 to -34. At -24, there is a 'Sand Pack Screen' indicated by a yellow dotted pattern. Between -25 and -26, there is a 'Sand Pack' indicated by a yellow dotted pattern. From -26 to -31, the borehole is filled with 'Grout' indicated by a grey hatched pattern.

# FIELD BOREHOLE LOG

BOREHOLE NO:

**DT01-MW1**

TOTAL DEPTH:

**44.5 FT**

| DEPTH | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION   | WELL CONSTRUCTION |
|-------|-------------|---------|----------|--------------|------|--|-------------------|
| 35    | DIRECT PUSH |         |          |              |      |  | -35               |
|       |             |         |          |              |      |  | -36               |
|       |             |         |          |              |      |  | -37               |
|       |             |         |          |              |      | ML: 10YR4/4 POORLY SORTED GRAVELLY SILT, low plasticity, sub rounded sand grains and sub angular to angular gravel, 20% clay, 40% silt, 10% fine sand, 15% fine gravel, 15% coarse gravel, very stiff, penetrometer 4.5+tsf                                  | -38               |
| 40    | DIRECT PUSH |         |          |              | ML   | ML: 10YR4/4 POORLY SORTED GRAVELLY SILT, low plasticity, sub rounded sand grains and sub angular gravel, 20% clay, 40% silt, 10% fine sand, 20% fine gravel, 10% coarse gravel, very stiff, penetrometer 4.5+tsf, with a N8 sandstone lens around 42.5ft bgs | -39               |
|       |             |         |          |              |      |  | -40               |
|       |             |         |          |              |      |  | -41               |
|       |             |         |          |              |      |  | -42               |
|       |             |         |          |              |      |  | -43               |
|       |             |         |          |              |      |  | -44               |



## FIELD BOREHOLE LOG

BOREHOLE NO: DT01-MW2  
TOTAL DEPTH: 39.25 FT

| PROJECT INFORMATION |             |         |                                    |              | DRILLING INFORMATION |   |                |                   |           |           |
|---------------------|-------------|---------|------------------------------------|--------------|----------------------|---|----------------|-------------------|-----------|-----------|
| PROJECT:            |             |         | Statewide WWTP Biosolids PFAS Eval |              |                      | CONTRACTOR:   | Mateco         |                   |           |           |
| SITE LOCATION:      |             |         | McCue Rd, Delhi, MI                |              |                      | CREW CHIEF:   | Mitch Slachter |                   |           |           |
| PROJECT NO.:        |             |         | 60588767                           |              |                      | DRILL RIG TYPE:   | Geoprobe 7822  |                   |           |           |
| PROJECT MANAGER:    |             |         | Matt Vander Eide                   |              |                      | DRILLING METHOD:  | Direct Push    |                   |           |           |
| LOGGED BY:          |             |         | Kelly Moss                         |              |                      | HOLE DIAMETER:  | 2 1/4"         |                   |           |           |
| CREATED BY:         |             |         | Kaitlyn Eicholtz                   |              |                      | DATE START:   | 12/10/19 10:05 |                   |           |           |
|                     |             |         |                                    |              |                      | DATE END:   | 12/10/19 11:45 |                   |           |           |
| DEPTH               | SAMPLE TYPE | ATTEMPT | RECOVERY                           | SOIL SYMBOLS | USCS                 | SOIL DESCRIPTION  |                | WELL CONSTRUCTION |           |           |
| 0                   | DIRECT PUSH |         |                                    | OL           |                      | OL: 10YR2/2 POORLY SORTED SANDY ORGANIC SILT, low plasticity, sub rounded sand grains and sub angular gravel, 20% clay, 50% silt, 20% fine sand, 10% medium sand, trace fine gravel, cohesive                                       |                | 0                 | DT01-MW2S | DT01-MW2D |
|                     |             |         |                                    | OL           |                      | OL: 10YR4/2 POORLY SORTED SANDY ORGANIC SILT, low plasticity, sub rounded sand grains and sub angular gravel, 35% clay, 35% silt, 20% fine sand, 10% medium sand, trace fine gravel, cohesive, sharp color contact above            |                | -1                |           |           |
|                     |             |         |                                    | OL           |                      | OL: 10YR2/1 WELL SORTED ORGANIC SILT, low plasticity, sub rounded sand grains and sub angular gravel, 30% clay, 60% silt, 10% fine sand, trace fine gravel, few roots, sharp color contact above                                    |                | -2                |           |           |
|                     |             |         |                                    | CH           |                      | CH: 10YR4/1 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity, sub rounded sand grains and sub angular gravel, 50% clay, 30% silt, trace fine sand, 20% fine gravel   |                | -3                |           |           |
|                     |             |         |                                    | SM           |                      | SM: 10YR5/3 WELL SORTED SILTY FINE SAND, non plastic, sub rounded sand grains, trace clay, 30% silt, 50% fine sand, 20% medium sand, trace coarse sand, with occasional silt lenses   |                | -4                | 2" PVC    |           |
|                     |             |         |                                    | SM           |                      | SM: 10YR4/6 POORLY SORTED SILT MEDIUM SAND WITH GRAVEL, non plastic, sub rounded sand grains and angular gravel, 15% silt, 10% fine sand, 30% medium sand, 5% coarse sand, 30% fine gravel, 10% coarse gravel, iron staining        |                | -5                |           |           |
|                     |             |         |                                    | SM           |                      | SM: 10YR3/3 WELL SORTED SILTY FINE SAND, non plastic, sub rounded sand grains and sub angular gravel, 10% clay, 30% silt, 40% fine sand, 20% medium sand, trace fine gravel, trace coarse gravel, with few gravel lenses            |                | -6                | Bentonite | 2" PVC    |
|                     |             |         |                                    | CH           |                      | CH: 10YR4/1 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity, sub rounded sand grains and sub angular gravel, 50% clay, 30% silt, trace fine sand, 15% fine gravel, 5% coarse gravel   |                | -7                |           |           |
|                     |             |         |                                    | SP           |                      | SP: 10YR4/3 WELL SORTED MEDIUM SAND, non plastic, sub rounded sand grains, trace silt, 25% fine sand, 65% medium sand, 10% coarse sand, uniform, wet  |                | -8                | Sand Pack |           |
|                     |             |         |                                    | CH           |                      | CH: 10YR4/1 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity, sub rounded sand grains and sub angular gravel, 50% clay, 30% silt, trace fine sand, 15% fine gravel, 5% coarse gravel, cohesive, very stiff, penetrometer +4.5tsf |                | -9                |           | Screen    |
| 10                  | DIRECT PUSH |         |                                    |              |                      |   |                | 10                |           |           |

**FIELD BOREHOLE LOG**

BOREHOLE NO:

**DT01-MW2**

TOTAL DEPTH:

**39.25 FT**

| DEPTH | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS  | SOIL DESCRIPTION   | WELL CONSTRUCTION |
|-------|-------------|---------|----------|--------------|-------|--|-------------------|
|       | DIRECT PUSH |         |          |              |       | SP: 10YR4/4 WELL SORTED MEDIUM SAND, non plastic, sub rounded sand grains and sub angular gravel, 10% fine sand, 50% medium sand, 40% coarse sand, trace fine gravel, uniform, wet   | DT01-MW2S         |
|       |             |         |          |              | SP    | CH: 10YR4/1 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity, sub rounded sand grains and sub angular gravel, 50% clay, 30% silt, trace fine sand, 15% fine gravel, 5% coarse gravel, cohesive, very stiff, penetrometer +4.5tsf  | Screen            |
| 15    | DIRECT PUSH |         |          |              | CH    | CH: 10YR4/1 WELL SORTED FAT CLAY, high plasticity, sub rounded sand grains and sub angular gravel, 60% clay, 30% silt, trace fine sand, 10% fine gravel, decreasing gravel content with depth, very stiff to stiff, softening with depth, penetrometer 3.0tsf at 15.5ft bgs and 2.5tsf at 17.5ft bgs | Bentonite         |
|       |             |         |          |              | CH    |  | 2" PVC            |
| 20    | DIRECT PUSH |         |          |              | SP-SM | SP-SM: 10YR4/1 and 5YR4/2 WELL SORTED FINE SAND WITH SILT, non plastic, sub rounded sand grains, trace clay, 10% silt, 80% fine sand, 10% medium sand, dense, wet  | Sand Pack         |
|       |             |         |          |              | SP-SM | SP-SM: 10YR4/1 and 5YR4/2 WELL SORTED FINE SAND WITH SILT, non plastic, sub rounded sand grains, trace clay, 10% silt, 70% fine sand, 20% medium sand, uniform, wet  | Screen            |

# FIELD BOREHOLE LOG

BOREHOLE NO:

**DT01-MW2**

TOTAL DEPTH:

**39.25 FT**

| DEPTH | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION   | WELL CONSTRUCTION        |
|-------|-------------|---------|----------|--------------|------|--|--------------------------|
|       | DIRECT PUSH |         |          |              |      |  |                          |
| 25    | DIRECT PUSH |         |          | SW-SM        |      | SW-SM: 10YR4/1 POORLY SORTED MEDIUM SAND WITH SILT AND GRAVEL, non plastic, sub rounded sand grains and sub rounded to sub angular gravel, 10% silt, 10% fine sand, 30% medium sand, 20% coarse sand, 20% fine gravel, 10% coarse gravel, average gravel 5mm to 15mm, loose, wet | -23<br>-24<br>-25        |
|       |             |         |          | ML           |      | ML: 10YR4/2 POORLY SORTED SILTY MEDIUM SAND WITH GRAVEL, non plastic, sub rounded sand grains and sub angular gravel, 20% clay, 30% silt, 10% fine sand, 20% medium sand, 5% coarse sand, 15% fine gravel, wet   | -26<br>-27<br>-28        |
|       |             |         |          | ML           |      | ML: 10YR4/2 POORLY WELL SORTED SANDY SILT, low plasticity, sub rounded sand grains and sub angular gravel, 20% clay, 45% silt, 20% fine sand, 10% medium sand, 5% fine gravel, wet, stiff, penetrometer 2.0tsf   | -29                      |
|       |             |         |          | ML           |      | ML: 10YR4/2 POORLY SORTED SANDY SILT WITH GRAVEL, low plasticity, sub rounded sand grains and sub angular gravel, 20% clay, 40% silt, 10% fine sand, 10% medium sand, 10% fine gravel, 10% coarse gravel, wet, medium to stiff, penetrometer 1.0tsf                              | -30                      |
| 30    | DIRECT PUSH |         |          | ML           |      | ML: 10YR4/2 POORLY SORTED GRAVELLY SILT, low plasticity, sub rounded sand grains and sub angular gravel, 35% clay, 35% silt, 10% fine sand, trace medium sand, 10% fine gravel, 10% coarse gravel, cohesive, very stiff, penetrometer 3.0tsf                                     | -31<br>-32<br>-33<br>-34 |
|       |             |         |          | CH           |      | CH: 10YR4/2 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity sub rounded sand grains and sub angular gravel, 50% clay, 30% silt, trace fine sand, 10% fine gravel, 10% coarse gravel, cohesive, hard, penetrometer +4.5tsf  |                          |

# FIELD BOREHOLE LOG

BOREHOLE NO: **DT01-MW2**  
 TOTAL DEPTH: **39.25 FT**

| DEPTH | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION   | WELL CONSTRUCTION               |
|-------|-------------|---------|----------|--------------|------|--|---------------------------------|
| 35    | DIRECT PUSH |         |          |              | CH   | CH: 10YR4/2 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity sub rounded sand grains and sub angular gravel, 50% clay, 30% silt, trace fine sand, 15% fine gravel, 5% coarse gravel, cohesive, hard, penetrometer +4.5tsf | -35<br>-36<br>-37<br>-38<br>-39 |



## FIELD BOREHOLE LOG

BOREHOLE NO: DT02-MW1  
TOTAL DEPTH: 35 FT

| PROJECT INFORMATION |             |         |                                    |              | DRILLING INFORMATION |  |                |                   |           |
|---------------------|-------------|---------|------------------------------------|--------------|----------------------|--|----------------|-------------------|-----------|
| PROJECT:            |             |         | Statewide WWTP Biosolids PFAS Eval |              |                      | CONTRACTOR:  | Mateco         |                   |           |
| SITE LOCATION:      |             |         | McCue Rd, Delhi, MI                |              |                      | CREW CHIEF:  | Mitch Slachter |                   |           |
| PROJECT NO.:        |             |         | 60588767                           |              |                      | DRILL RIG TYPE:  | Geoprobe 7822  |                   |           |
| PROJECT MANAGER:    |             |         | Matt Vander Eide                   |              |                      | DRILLING METHOD:   | Direct Push    |                   |           |
| LOGGED BY:          |             |         | Kelly Moss                         |              |                      | HOLE DIAMETER:   | 2 1/4"         |                   |           |
| CREATED BY:         |             |         | Kaitlyn Eicholtz                   |              |                      | DATE START:  | 12/11/19 1330  |                   |           |
|                     |             |         |                                    |              |                      | DATE END:  | 12/11/19 14:25 |                   |           |
| DEPTH               | SAMPLE TYPE | ATTEMPT | RECOVERY                           | SOIL SYMBOLS | USCS                 | SOIL DESCRIPTION   |                | WELL CONSTRUCTION |           |
| 0                   | DIRECT PUSH |         |                                    | SM           |                      | SM: 10YR2/2 POORLY SORTED SILTY FINE SAND, low plasticity, sub rounded sand grains and sub angular gravel, 10% clay, 30% silt, 40% fine sand, 20% medium sand, trace fine gravel, organic silt, twigs and roots        |                | 0                 | DT02-MW1S |
|                     |             |         |                                    | SP-SM        |                      | SP-SM: 10YR4/2 WELL SORTED FINE SAND WITH SILT, non plastic, sub rounded sand grains, 10% silt, 80% fine sand, 10% medium sand, trace coarse sand, wet   |                | -1                | 2" PVC    |
|                     |             |         |                                    | OL           |                      | OL: 10YR2/2 POORLY SORTED SANDY ORGANIC SILT, low plasticity, sub rounded sand grains, 30% clay, 40% silt, 20% fine sand, 10% medium sand, few roots   |                | -2                |           |
|                     |             |         |                                    | SP           |                      | SP: 10YR4/2 WELL SORTED MEDIUM SAND, non plastic, sub rounded sand grains, sub angular gravel, trace silt, 15% fine sand, 60% medium sand, 15% coarse sand, 5% fine gravel, 5% coarse gravel, wet                      |                | -3                | Sand Pack |
|                     |             |         |                                    | CH           |                      | CH: 10YR4/2 WELL SORTED FAT CLAY, high plasticity, sub angular gravel, 80% clay, 15% silt, 5% fine gravel, cohesive, 50mm coarse gravel at 4ft bgs   |                | -4                | Screen    |
| 5                   | DIRECT PUSH |         |                                    | SP           |                      | SP: 10YR4/2 POORLY SORTED MEDIUM SAND WITH GRAVEL, non plastic, sub rounded sand grains and sub angular gravel, trace silt, trace fine sand, 40% medium sand, 20% coarse sand, 30% fine gravel, 10% coarse gravel, wet |                | -5                | Bentonite |
|                     |             |         |                                    | CH           |                      | CH: 10YR4/1 WELL SORTED FAT CLAY, high plasticity, sub angular gravel, 80% clay, 15% silt, 5% fine gravel, hard, penetrometer +4.5tsf  |                | -6                | 2" PVC    |
| 10                  | DIRECT PUSH |         |                                    |              |                      |  |                | -7                | Sand Pack |
|                     |             |         |                                    |              |                      |  |                | -8                |           |
|                     |             |         |                                    |              |                      |  |                | -9                |           |
|                     |             |         |                                    |              |                      |  |                | -10               |           |

| FIELD BOREHOLE LOG |             |         |          |              | BOREHOLE NO:<br>DT02-MW1<br>TOTAL DEPTH:<br>35 FT |   |  |
|--------------------|-------------|---------|----------|--------------|---|---|--|
| DEPTH              | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS  | SOIL DESCRIPTION  | WELL CONSTRUCTION  |
|                    | DIRECT PUSH |         |          |              | GP  | GP: 10YR4/2 WELL SORTED FINE GRAVEL WITH SAND, non plastic, sub rounded sand grains and sub angular gravel, 5% silt, 10% fine sand, 10% medium sand, trace coarse sand, 55% fine gravel, 20% coarse gravel, uniform, wet      |  |
| 15                 | DIRECT PUSH |         |          |              | ML  | ML: 10YR4/2 POORLY SORTED SANDY SILT WITH GRAVEL, low plasticity, sub rounded sand grains and sub angular gravel, 10% clay, 40% silt, 10% fine sand, 15% medium sand, 15% coarse sand, 10% fine gravel, 5% coarse gravel, wet | -11<br>-12<br>-13<br>-14<br>-15<br>-16<br>-17<br>-18<br>-19<br>-20<br>-21<br>-22 |
| 20                 | DIRECT PUSH |         |          |              | CH  | CH: 10YR4/2 POORLY SORTED GRAVELLY FAT CLAY, high plasticity, sub rounded sand grains and sub angular gravel, 50% clay, 20% silt, 10% fine sand, 15% fine gravel, 5% coarse gravel, hard, penetrometer +4.5tsf, wet           |  |
|                    |             |         |          |              |   | CH: 10YR4/2 POORLY SORTED FAT CLAY WITH GRAVEL, high plasticity, sub  |  |

| FIELD BOREHOLE LOG |             |         |          |              |      | BOREHOLE NO:<br><b>DT02-MW1</b>   | WELL CONSTRUCTION |
|--------------------|-------------|---------|----------|--------------|------|---|-------------------|
| DEPTH              | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION  |                   |
|                    | DIRECT PUSH |         |          |              |      | angular gravel, 65% clay, 20% silt, 10% fine gravel, 5% coarse gravel, wet, with occasional nodules of 10YR8/1 sandstone  |                   |
| 25                 | DIRECT PUSH |         |          |              | CH   |   | -23               |
|                    |             |         |          |              |      |   | -24               |
|                    |             |         |          |              | CH   | CH: 10YR4/1 POORLY SORTED FAT CLAY, high plasticity, sub angular gravel, 70% clay, 20% silt, 10% fine gravel, trace coarse gravel   | -25               |
|                    |             |         |          |              | SM   | SM: 10YR4/1 POORLY SORTED SILTY FINE SAND, non plastic, sub rounded sand grains, 10% clay, 30% silt, 40% fine sand, 20% medium sand, trace coarse sand, loose, wet  | -26               |
|                    |             |         |          |              | CH   | CH: 10YR4/1 POORLY SORTED FAT CLAY, high plasticity, sub angular gravel, 70% clay, 20% silt, 10% fine gravel, trace coarse gravel, hard, penetrometer +4.5tsf, cohesive, with occasional nodules of 10YR8/1 sandstone                                   | -27               |
| 30                 | DIRECT PUSH |         |          |              |      |   | -28               |
|                    |             |         |          |              |      |   | -29               |
|                    |             |         |          |              | CH   |   | -30               |
|                    |             |         |          |              |      |   | -31               |
|                    |             |         |          |              | ML   | ML: 10YR4/2 POORLY SORTED SANDY SILT, low plasticity, sub rounded sand grains and sub angular gravel, 15% clay, 50% silt, 20% fine sand, 5% medium sand, 5% fine gravel, 5% coarse gravel, average gravel 15mm, occasional nodules of 10YR8/1 sandstone | -32               |
|                    |             |         |          |              |      |   | -33               |
|                    |             |         |          |              |      |   | -34               |
|                    |             |         |          |              |      |   | Grout             |

**FIELD BOREHOLE LOG**BOREHOLE NO: **DT02-MW1**  
TOTAL DEPTH: **35 FT**

| DEPTH | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION | WELL CONSTRUCTION |
|-------|-------------|---------|----------|--------------|------|------------------|-------------------|
| 35    |             |         |          |              |      |                  |                   |



## FIELD BOREHOLE LOG

BOREHOLE NO: DT02-MW2  
TOTAL DEPTH: 48 FT

| PROJECT INFORMATION   |  |                                    |         |          | DRILLING INFORMATION |      |  |  |  |  |  |  |
|---|--|------------------------------------|---------|----------|----------------------|------|--|--|--|--|--|--|
| PROJECT:  |  | Statewide WWTP Biosolids PFAS Eval |         |          | CONTRACTOR:          |      | Mateco   |  |  |  |  |  |
| SITE LOCATION:  |  | McCue Rd, Delhi, MI                |         |          | CREW CHIEF:          |      | Mitch Slachter   |  |  |  |  |  |
| PROJECT NO.:  |  | 60588767                           |         |          | DRILL RIG TYPE:      |      | Geoprobe 7822  |  |  |  |  |  |
| PROJECT MANAGER:  |  | Matt Vander Eide                   |         |          | DRILLING METHOD:     |      | Direct Push  |  |  |  |  |  |
| LOGGED BY:  |  | Kelly Moss                         |         |          | HOLE DIAMETER:       |      | 2 1/4"   |  |  |  |  |  |
| CREATED BY:   |  | Kaitlyn Eicholtz                   |         |          | DATE START:          |      | 12/12/19 11:15   |  |  |  |  |  |
| DEPTH   |  | SAMPLE TYPE                        | ATTEMPT | RECOVERY | SOIL SYMBOLS         | USCS | SOIL DESCRIPTION   |  |  |  |  |  |
| 0   |  | DIRECT PUSH                        |         |          | OL                   |      | OL: 10YR2/2 POORLY SORTED SANDY ORGANIC SILT, low plasticity, sub rounded sand grains, 20% clay, 40% silt, 30% fine sand, 10% medium sand, few roots and twigs             |  |  |  |  |  |
|   |  |                                    |         |          | ML                   |      | ML: 10YR4/3 mottled with 10YR4/6 WELL SORTED SANDY SILT, non plastic, sub rounded sand grains and sub angular gravel, 10% clay, 50% silt, 40% fine sand, trace fine gravel |  |  |  |  |  |
| 5   |  | DIRECT PUSH                        |         |          | CH                   |      | CH: 10YR5/4 WELL SORTED FAT CLAY, high plasticity, sub angular gravel, 70% clay, 20% silt, 10% fine gravel, trace coarse gravel, soft, penetrometer 0.5tsf                 |  |  |  |  |  |
| 10  |  | DIRECT PUSH                        |         |          | CH                   |      | CH: 10YR5/4 WELL SORTED FAT CLAY, high plasticity, sub angular gravel, 75% clay, 20% silt, 5% fine gravel, soft, penetrometer 0.5tsf, moist, cohesive                      |  |  |  |  |  |
|   |  |                                    |         |          |                      |      |  |  |  |  |  |  |
| WELL CONSTRUCTION<br>DT02-MW2S DT02-MW2D<br>Sand Pack<br>Bentonite 2" PVC<br>2" PVC |  |                                    |         |          |                      |      |  |  |  |  |  |  |

## FIELD BOREHOLE LOG

BOREHOLE NO: DT02-MW2  
TOTAL DEPTH: 48 FT

**FIELD BOREHOLE LOG**

BOREHOLE NO:

**DT02-MW2**

TOTAL DEPTH:

**48 FT**

| DEPTH | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION   | WELL CONSTRUCTION               |
|-------|-------------|---------|----------|--------------|------|--|---------------------------------|
|       | DIRECT PUSH |         |          |              |      |  |                                 |
| 25    |             |         |          |              | CL   | CL: 10YR4/1 POORLY SORTED SANDY LEAN CLAY, low plasticity, sub rounded sand grains, 40% clay, 20% silt, 35% fine sand, 5% medium sand                                  | -23<br>-24<br>-25               |
|       | DIRECT PUSH |         |          |              | SP   | SP: 10YR4/1 WELL SORTED FINE SAND, non plastic, sub rounded sand grains, 5% silt, 90% fine sand, 5% medium sand, uniform, wet, with a thin clay lens around 26.5ft bgs | -26<br>-27<br>-28<br>-29<br>-30 |
| 30    |             |         |          |              | SM   | SM: 10YR4/1 WELL SORTED SILTY FINE SAND, non plastic, sub rounded sand grains, 10% clay, 30% silt, 60% fine sand, with a silt lens                                     | -31                             |
|       | DIRECT PUSH |         |          |              | SP   | SP: 10YR4/1 WELL SORTED FINE SAND, non plastic, sub rounded sand grains, 5% silt, 90% fine sand, 5% medium sand, uniform, wet  | -32<br>-33<br>-34               |

# FIELD BOREHOLE LOG

BOREHOLE NO:

**DT02-MW2**

TOTAL DEPTH:

**48 FT**

| DEPTH | SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL SYMBOLS | USCS | SOIL DESCRIPTION   | WELL CONSTRUCTION |
|-------|-------------|---------|----------|--------------|------|--|-------------------|
| 35    | DIRECT PUSH |         |          |              | SP   |  | -35               |
| 40    | DIRECT PUSH |         |          |              | CH   | CH: 10YR4/1 POORLY SORTED FAT CLAY, high plasticity, sub rounded sand grains and sub angular gravel, 70% clay, 20% silt, trace fine sand, 10% fine gravel, trace coarse gravel, cohesive, very stiff, penetrometer 3.0tsf, with occasional 10YR8/1 sandstone nodules | -40               |
| 45    | ECT PUSH    |         |          |              |      |  | -45               |
|       |             |         |          |              |      |  | -46               |
|       |             |         |          |              |      |  |                   |

**FIELD BOREHOLE LOG**BOREHOLE NO: **DT02-MW2**  
TOTAL DEPTH: **48 FT**

| DEPTH | DIR<br>SAMPLE TYPE | ATTEMPT | RECOVERY | SOIL<br>SYMBOLS | USCS | SOIL DESCRIPTION | WELL<br>CONSTRUCTION |
|-------|--------------------|---------|----------|-----------------|------|------------------|----------------------|
|       | -48                |         |          |                 |      |                  |                      |

# **Appendix B**

## **Low Flow Ground Water Sample Collection Record**

Well ID: DT01-MW15

**Client:** EGLE  
**Project:** Statewide Biosolids PFAS Evaluation  
**Project #:** 60588767

**INFECTION**

|                            |   |  |    |   |   |  |    |
|----------------------------|---|--|----|---|---|--|----|
| Label on well?             | <input checked="" type="checkbox"/> YES | NO                                     | NA | Is cap locked?                            | <input checked="" type="checkbox"/> YES | NO                                     | NA |
| Is reference mark visible? | YES                                     | <input checked="" type="checkbox"/> NO | NA | Standing water present?                   | YES                                     | <input checked="" type="checkbox"/> NO | NA |
| Condition of well          | <hr/>                                   |  |    | Any indication of surface runoff in well? | YES                                     | <input checked="" type="checkbox"/> NO | NA |
| Weather                    | <hr/>                                   |  |    | Air Temperature:                          | <hr/>                                   |  |    |
| Notes:                     | <hr/> <hr/> <hr/>                       |  |    |   |   |  |    |

#### **STATIC WATER LEVEL PRIOR TO PURGING**

Date: 1-13-20 Time: 0950 AM/PM  
Depth to Water: 3.39 Measured with: Electronic Tape  
Length of Well: 10.53 Decontamination: Pre Steam Cleaned Chalk & Steel Tape  
DI Water Other

## **WELL PURGING**

Date: 1-3-20 Begin Time: 0955 AM/PM Purging Equipment: Peristaltic Pump  
End Time: 1925 AM/PM Decontamination: Pre Steam Cleaned New Tubing DI Water Other

## CALCULATION OF 1 CASING VOLUME

|              |      |                                       |                        |             |                    |
|--------------|------|---------------------------------------|------------------------|-------------|--------------------|
| <u>10.53</u> | ft.  | Length of well                        | <u>Yield:</u>          | <u>HIGH</u> | <u>LOW</u>         |
| <u>3.39</u>  | ft.  | - depth of water (before purge start) | If low, recovery time: | <u>NA</u>   |                    |
| <u>7.14</u>  | ft.  | =length of water column               |                        |             |                    |
|              |      | x conversion factor (2" well) 0.16    |                        |             |                    |
| <u>114</u>   | Gal. | =1 casing volume                      | Actual volume purged   | <u>2.5</u>  | gallons            |
|              |      |                                       | Actual purge flow rate | <u>200</u>  | ml/min or<br>l/min |

**Notes** \_\_\_\_\_  
\_\_\_\_\_

**Final:**

### SAMPLE COLLECTION

Date: 1-3-20 Time: 1025 AM/PM Method Submersible Pump

Appearance of Sample: Clear      Actual Sample Flow Rate: 250 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

#### **SALVAGING PERSONNEL**

Name Russell Platte

## Low Flow Ground Water Sample Collection Record

Well ID: DT01-MW1D

Client: EGLE  
 Project: Statewide Biosolids PFAS Evaluation  
 Project #: 60588767

## INSPECTION

|                            |   |  |    |   |   |                             |    |
|----------------------------|---|--|----|---|---|-----------------------------|----|
| Label on well?             | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO            | NA | Is cap locked?                            | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | NA |
| Is reference mark visible? | <input type="checkbox"/> YES            | <input checked="" type="checkbox"/> NO | NA | Standing water present?                   | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | NA |
| Condition of well          | <i>Good</i>                             |  |    | Any indication of surface runoff in well? | <input checked="" type="checkbox"/> YES | <input type="checkbox"/> NO | NA |
| Weather                    | <i>Cloudy wind 3-5 mph</i>              |  |    | Air Temperature:                          | <i>31°F</i>                             |                             |    |

Notes:

## STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-13-20 Time: 1040 AM/PM  
 Depth to Water: 13.37  
 Length of Well: 29.14

Measured with: Electronic Tape  
 Decontamination: Pre Steam Cleaned  
 Chalk & Steel Tape  
 DI Water Other

## WELL PURGING

|               |                  |       |                                     |
|---------------|------------------|-------|-------------------------------------|
| Date: 1-13-20 | Begin Time: 1045 | AM/PM | Purging Equipment: Peristaltic Pump |
|               | End Time: 1200   | AM/PM | Decontamination: Pre Steam Cleaned  |
|               |                  |       | New Tubing                          |
|               |                  |       | DI Water Other                      |

## CALCULATION OF 1 CASING VOLUME

|           |                                       |   |
|-----------|---------------------------------------|---|
| 29.14 ft. | Length of well                        | Yield: <i>HIGH</i>                                |
| 13.37 ft. | - depth of water (before purge start) | LOW   |
| 15.77 ft. | =length of water column               |   |
| 2.52 Gal. | x conversion factor (2" well) 0.16    | Actual volume purged <i>4.6</i> gallons           |
|           | =1 casing volume                      | Actual purge flow rate <i>250</i> ml/min or L/min |

Notes

| Time        | Volume (gallons) | Depth to Water (Feet) <0.33' | pH (SU) | Conductivity (mS/cm) | Turbidity (NTU) | D.O. (mg/L) | Temp (°C) | ORP (°C) |
|-------------|------------------|------------------------------|---------|----------------------|-----------------|-------------|-----------|----------|
| Start: 1100 | 1.3              | 13.50                        | 7.28    | 0.607                | 70.82           | 1.03        | 9.0       | 22.1     |
| 1105        | 1.6              | 13.50                        | 7.17    | 0.597                | 58.72           | 0.59        | 9.0       | 20.6     |
| 1110        | 1.9              | 13.50                        | 7.16    | 0.589                | 40.02           | 0.33        | 9.4       | 18.6     |
| 1115        | 2.2              | 13.50                        | 7.21    | 0.583                | 23.81           | 0.27        | 9.5       | 14.6     |
| 1120        | 2.5              | 13.50                        | 7.26    | 0.578                | 16.72           | 0.20        | 9.6       | -3.25    |
| 1125        | 2.8              | 13.50                        | 7.28    | 0.575                | 14.37           | 0.18        | 9.5       | -15.5    |
| 1130        | 3.1              | 13.50                        | 7.29    | 0.573                | 13.96           | 0.16        | 9.5       | -70.2    |
| 1135        | 3.4              | 13.50                        | 7.27    | 0.570                | 16.75           | 0.15        | 9.7       | -76.9    |
| 1140        | 3.7              | 13.50                        | 7.28    | 0.570                | 21.42           | 0.15        | 9.6       | -74.3    |
| 1145        | 4.0              | 13.50                        | 7.28    | 0.569                | 19.20           | 0.13        | 9.6       | -85.5    |
| Final: 1150 | 4.3              | 13.50                        | 7.28    | 0.568                | 26.03           | 0.13        | 9.6       | -87.5    |

## SAMPLE COLLECTION

Date: 1-13-20 Time: 1155 AM/PM Method: Submersible Pump

Appearance of Sample: clear Actual Sample Flow Rate: *250* ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

## SAMPLING PERSONNEL

Name Russell Platte

Company: AECOM

## Low Flow Ground Water Sample Collection Record

Well ID: DT01-MW25

Client: EGLE  
 Project: Statewide Biosolids PFAS Evaluation  
 Project #: 60588767

## INSPECTION

|                            |  |    |    |   |  |  |    |
|----------------------------|--|----|----|---|--|--|----|
| Label on well?             | <input checked="" type="checkbox"/> YES    | NO | NA | Is cap locked?                            | <input checked="" type="checkbox"/> YES  | NO                                     | NA |
| Is reference mark visible? | <input checked="" type="checkbox"/> YES    | NO | NA | Standing water present?                   | <input checked="" type="checkbox"/> YES  | <input checked="" type="checkbox"/> NO | NA |
| Condition of well          | <input checked="" type="checkbox"/> Good   | NO | NA | Any indication of surface runoff in well? | <input checked="" type="checkbox"/> YES  | <input checked="" type="checkbox"/> NO | NA |
| Weather                    | <input checked="" type="checkbox"/> cloudy | NO | NA | Air Temperature:                          | <input checked="" type="checkbox"/> 31°F | NO                                     | NA |
| Notes:                     |  |    |    |   |  |  |    |

## STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-13-20 Time: 12:15 AM/PM  
 Depth to Water: 6.37  
 Length of Well: 14.60

Measured with: Electronic Tape  
 Decontamination: Pre Steam Cleaned

Chalk & Steel Tape  
 DI Water Other

## WELL PURGING

|               |                   |       |                                     |
|---------------|-------------------|-------|-------------------------------------|
| Date: 1-13-20 | Begin Time: 12:20 | AM/PM | Purging Equipment: Peristaltic Pump |
|               | End Time: 13:25   | AM/PM | Decontamination: Pre Steam Cleaned  |
|               |                   |       | New Tubing                          |
|               |                   |       | DI Water Other                      |

## CALCULATION OF 1 CASING VOLUME

|           |                                       |  |
|-----------|---------------------------------------|--|
| 14.60 ft. | Length of well                        | Yield: HIGH LOW                            |
| 6.37 ft.  | - depth of water (before purge start) | if low, recovery time: NA                  |
| 8.23 ft.  | =length of water column               |  |
| 1.31 Gal. | x conversion factor (2" well) 0.16    | Actual volume purged 20 gallons            |
|           | =1 casing volume                      | Actual purge flow rate 150 ml/min or L/min |

Notes

| Time         | Volume (gallons) | Depth to Water (Feet) <0.33' | PH (SU) | Conductivity (mS/cm) | Turbidity (NTU) | D.O. (mg/L) | Temp (°C) | ORP (°C) |
|--------------|------------------|------------------------------|---------|----------------------|-----------------|-------------|-----------|----------|
| Start: 12:30 | 0.5              | 7.99                         | 6.98    | 1.322                | 5.34            | 2.21        | 7.1       | 76.4     |
| 12:35        | 0.7              | 8.21                         | 6.97    | 1.327                | 2.69            | 2.27        | 6.5       | 97.7     |
| 12:40        | 0.8              | 8.44                         | 6.97    | 1.334                | 6.76            | 2.26        | 6.6       | 108.2    |
| 12:45        | 1.1              | 8.48                         | 6.95    | 1.344                | 8.07            | 2.35        | 6.4       | 125.0    |
| 12:50        | 1.3              | 8.51                         | 6.94    | 1.348                | 6.02            | 2.40        | 6.5       | 141.4    |
| 12:55        | 1.4              | 8.55                         | 6.94    | 1.346                | 6.28            | 2.42        | 6.5       | 153.3    |
| 13:00        | 1.5              | 8.60                         | 6.94    | 1.345                | 7.51            | 2.44        | 6.5       | 160.9    |
| 13:05        | 1.6              | 8.64                         | 6.95    | 1.340                | 5.80            | 2.48        | 6.5       | 175.4    |
| 13:10        | 1.7              | 8.66                         | 6.95    | 1.339                | 6.90            | 2.47        | 6.6       | 180.0    |
| 13:15        | 1.9              | 6.68                         | 6.95    | 1.336                | 5.69            | 2.48        | 6.3       | 189.2    |

Final:

SAMPLE COLLECTION  
 Date: 1-13-20 Time: 13:20 AM/PM Method: Submersible Pump  
 Appearance of Sample: Clear Actual Sample Flow Rate: 150 ml/min or L/min

Sample ID: GW2001131320R41  
 GW2001131320RAP-FC

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

## SAFETY PERSONNEL

Name: Russell Platte

Company:

AECOM

## Low Flow Ground Water Sample Collection Record

Well ID: DT01-MW2D

Client: EGLE  
 Project: Statewide Biosolids PFAS Evaluation  
 Project #: 60588767

## INSPECTION

Label on well? S NO NA Is cap locked? YES NO NA  
 Is reference mark visible? YES NO NA Standing water present? YES NO NA  
 Condition of well Goo Any indication of surface runoff in well? YES NO NA  
 Weather cloudy Air Temperature: 31°F  
 Notes:

## STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-13-20 Time: 1325 AM/PM

Depth to Water: 6.47 Length of Well: 26.50

Measured with: Electronic Tape  
Decontamination: Pre Steam CleanedChalk & Steel Tape  
DI Water Other

## WELL PURGING

|               |                        |   |
|---------------|------------------------|---|
| Date: 1-13-20 | Begin Time: 1330 AM/PM | Purging Equipment: Peristaltic Pump           |
|               | End Time: 1440 AM/PM   | Decontamination: Pre Steam Cleaned New Tubing |
|               |                        | DI Water Other                                |

## CALCULATION OF 1 CASING VOLUME

|                  |                                       |  |
|------------------|---------------------------------------|--|
| 26.50 ft.        | Length of well                        | Yield: HIGH LOW                            |
| 6.47 ft.         | - depth of water (before purge start) | If low, recovery time: NA                  |
| 20.03 ft.        | =length of water column               | Actual volume purged 4.6 gallons           |
| 3.21 Gal.        | x conversion factor (2" well) 0.16    | Actual purge flow rate 250 ml/min or L/min |
| =1 casing volume |                                       |  |

Notes

| Time        | Volume (gallons) | Depth to Water (Feet) <0.33' | PH (SU) | Conductivity (mS/cm) | Turbidity (NTU) | D.O. (mg/L) | Temp (°C) | ORP (°C) |
|-------------|------------------|------------------------------|---------|----------------------|-----------------|-------------|-----------|----------|
| Start: 1340 | 1.3              | 6.41                         | 7.24    | 0.657                | 25.76           | 0.17        | 9.0       | -40.8    |
| 1345        | 1.6              | 6.41                         | 7.23    | 0.656                | 21.89           | 0.34        | 8.9       | -53.6    |
| 1350        | 1.9              | 6.41                         | 7.23    | 0.654                | 15.19           | 0.12        | 9.2       | -62.2    |
| 1355        | 2.2              | 6.41                         | 7.23    | 0.652                | 17.23           | 0.11        | 9.2       | -72.6    |
| 1400        | 2.5              | 6.41                         | 7.23    | 0.651                | 14.38           | 0.10        | 9.2       | -76.9    |
| 1405        | 2.8              | 6.41                         | 7.23    | 0.649                | 12.51           | 0.09        | 9.2       | -80.6    |
| 1410        | 3.1              | 6.41                         | 7.23    | 0.650                | 11.38           | 0.11        | 9.2       | -81.6    |
| 1415        | 3.4              | 6.41                         | 7.23    | 0.650                | 11.39           | 0.10        | 9.3       | -84.4    |
| 1420        | 3.7              | 6.41                         | 7.23    | 0.649                | 14.72           | 0.10        | 9.2       | -85.6    |
| 1425        | 4.0              | 6.41                         | 7.23    | 0.649                | 15.91           | 0.09        | 9.3       | -86.8    |
| Final: 1430 | 4.3              | 6.41                         | 7.23    | 0.649                | 18.41           | 0.09        | 9.4       | -87.6    |

## SAMPLE COLLECTION

Date: 1-13-20 Time: 1435 AM/PM Method: Submersible Pump Sample ID: GW2001131435 RAD

Appearance of Sample: Clear Actual Sample Flow Rate: 260 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

## SAMPLING PERSONNEL

Name Russell Platte

Company: AECOM



## Low Flow Ground Water Sample Collection Record

Well ID: DT02-MW1D

Client: EGLE  
 Project: Statewide Biosolids PFAS Evaluation  
 Project #: 60588767

## INSPECTION

Label on well?  YES  NO  NA Is cap locked?  YES  NO  NA

Is reference mark visible?  YES  NO  NA Standing water present?  YES  NO  NA

Condition of well Good Any indication of surface runoff in well?  YES  NO  NA

Weather Cloudy Air Temperature: 53°F

Notes:

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## STATIC WATER LEVEL PRIOR TO PURGING

Date: 1-14-20 Time: 11:00 AM/PMDepth to Water: 47.5Length of Well: 19.85

Measured with:

Electronic Tape

Chalk &amp; Steel Tape

Decontamination:

Pre Steam Cleaned

DI Water

Other

## WELL PURGING

|                      |                          |       |                                     |
|----------------------|--------------------------|-------|-------------------------------------|
| Date: <u>1-14-20</u> | Begin Time: <u>11:05</u> | AM/PM | Purging Equipment: Peristaltic Pump |
|                      | End Time: <u></u>        | AM/PM | Decontamination: Pre Steam Cleaned  |
|                      |                          |       | New Tubing                          |

## CALCULATION OF 1 CASING VOLUME

|                  |                                       |  |
|------------------|---------------------------------------|--|
| <u>19.85</u> ft. | Length of well                        | Yield: <input checked="" type="checkbox"/> HIGH <input type="checkbox"/> LOW |
| <u>4.75</u> ft.  | - depth of water (before purge start) | If low, recovery time: <u>NA</u>   |
| <u>15.1</u> ft.  | =length of water column               | Actual volume purged <u>5.5</u> gallons                                      |
| <u>2.42</u> Gal. | x conversion factor (2" well) 0.16    | Actual purge flow rate <u>200</u> ml/min or L/min                            |
|                  | =1 casing volume                      |  |

Notes

| Time                | Volume (gallons) | Depth to Water (Feet)<br><0.33' | PH (SU)     | Conductivity (mS/cm) | Turbidity (NTU) | D.O. (mg/L) | Temp (°C)  | ORP (°C)     |
|---------------------|------------------|---------------------------------|-------------|----------------------|-----------------|-------------|------------|--------------|
|                     |                  |                                 | +/- 0.1     | +/- 3%               | +/- 10%         | +/- 10%     | +/- 5 %    | +/- 10mV     |
| Start: <u>11:15</u> | <u>1.1</u>       | <u>4.79</u>                     | <u>7.10</u> | <u>0.647</u>         | <u>20.25</u>    | <u>1.26</u> | <u>9.0</u> | <u>203.0</u> |
| <u>11:20</u>        | <u>1.5</u>       | <u>4.79</u>                     | <u>7.16</u> | <u>0.657</u>         | <u>12.36</u>    | <u>0.57</u> | <u>9.1</u> | <u>159.4</u> |
| <u>11:25</u>        | <u>1.9</u>       | <u>4.79</u>                     | <u>7.19</u> | <u>0.663</u>         | <u>9.89</u>     | <u>0.38</u> | <u>9.3</u> | <u>91.1</u>  |
| <u>11:30</u>        | <u>2.3</u>       | <u>4.79</u>                     | <u>7.21</u> | <u>0.664</u>         | <u>8.79</u>     | <u>0.31</u> | <u>9.4</u> | <u>51.8</u>  |
| <u>11:35</u>        | <u>2.7</u>       | <u>4.79</u>                     | <u>7.21</u> | <u>0.664</u>         | <u>10.64</u>    | <u>0.29</u> | <u>9.4</u> | <u>30.7</u>  |
| <u>11:40</u>        | <u>3.1</u>       | <u>4.79</u>                     | <u>7.21</u> | <u>0.665</u>         | <u>15.37</u>    | <u>0.26</u> | <u>9.4</u> | <u>-0.9</u>  |
| <u>11:45</u>        | <u>3.5</u>       | <u>4.79</u>                     | <u>7.21</u> | <u>0.665</u>         | <u>17.07</u>    | <u>0.24</u> | <u>9.3</u> | <u>-35.0</u> |
| <u>11:50</u>        | <u>3.9</u>       | <u>4.79</u>                     | <u>7.21</u> | <u>0.669</u>         | <u>20.51</u>    | <u>0.26</u> | <u>9.3</u> | <u>-45.8</u> |
| <u>11:55</u>        | <u>4.3</u>       | <u>4.79</u>                     | <u>7.22</u> | <u>0.664</u>         | <u>24.29</u>    | <u>0.19</u> | <u>9.4</u> | <u>-58.6</u> |
| <u>12:00</u>        | <u>4.7</u>       | <u>4.79</u>                     | <u>7.22</u> | <u>0.665</u>         | <u>33.80</u>    | <u>0.18</u> | <u>9.4</u> | <u>-69.0</u> |
| Final: <u>12:05</u> | <u>5.1</u>       | <u>4.79</u>                     | <u>7.22</u> | <u>0.665</u>         | <u>26.91</u>    | <u>0.18</u> | <u>9.5</u> | <u>-73.8</u> |

## SAMPLE COLLECTION

Date: 1-14-20 Time: 1210 AM/PM Method: Submersible Pump Sample ID: GW200114121021

Appearance of Sample: clear Actual Sample Flow Rate: 200 ml/min or L/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

## SAMPLING PERSONNEL

Name Russell Platte

Company: AECOM

## **Low Flow Ground Water Sample Collection Record**

Well ID: DT02-MW2-S

**Client:** EGLE  
**Project:** Statewide Biosolids PFAS Evaluation  
**Project #:** 60588767

### **INFECTION**

|                            |   |    |    |   |   |  |    |
|----------------------------|---|----|----|---|---|--|----|
| Label on well?             | <input checked="" type="checkbox"/> YES | NO | NA | Is cap locked?                            | <input checked="" type="checkbox"/> YES | NO                                     | NA |
| Is reference mark visible? | <input checked="" type="checkbox"/> YES | NO | NA | Standing water present?                   | YES                                     | <input checked="" type="checkbox"/> NO | NA |
| Condition of well          | <u>Good</u>                             |    |    | Any indication of surface runoff in well? | YES                                     | <input checked="" type="checkbox"/> NO | NA |
| Weather                    | <u>Cloudy</u>                           |    |    | Air Temperature:                          | <u>31°F</u>                             |  |    |
| Notes:                     | <hr/> <hr/>                             |    |    |   |   |  |    |

#### **STATIC WATER LEVEL PRIOR TO PURGING**

Date: 1-18-20 Time: 14:55 AM/PM  
Depth to Water: 18.37 Measured with: Electronic Tape  
Length of Well: 22.90 Decontamination: Pre Steam Cleaned Chalk & Steel Tape  
DI Water Other

#### **WELL PURGING**

Date: 1-13-20 Begin Time: 1500 AM/PM AM Purging Equipment: Peristaltic Pump  
End Time: 1540 AM/PM PM Decontamination: Pre Steam Cleaned New Tubing DI Water Other

## CALCULATION OF 1 CASING VOLUME

22.90 ft. Length of well  
 18.37 ft. - depth of water (before purge start)  
~~18.453~~ ft. = length of water column  
 0.13 Gal. x conversion factor (2" well) 0.16  
               = 1 casing volume

Yield: HIGH LOW  
 If low, recovery time: NA

Actual volume purged 2.3 gallons  
 Actual purge flow rate 250 ml/min or

**Notes** \_\_\_\_\_

Final:

## SAMPLE COLLECTION

Date: 1-13-20 Time: 1535 AM/PM Method Submersible Pump  
Appearance of Sample: Clear Actual Sample Flow Rate: 250 ml/min or 1/min

SAMPLE BOTTLE COLLECTED: PFAS full list of 24

#### **SALVAGING PERSONNEL**

Name Russell Platte



# Appendix C

## 30N02W29-DT01 & DT02 USDA Web Soil Survey – Soil Description



MrA—Matherton sandy loam, *Landform*: Outwash plains, *Parent material*: Loamy over loamy and/or sandy outwash; loamy over sandy and gravelly glaciofluvial deposits

Co—Colwood-Brookston loams, *Landform*: Lake plains, *Parent material*: Stratified sandy and/or silty and/or loamy glaciolacustrine deposits

Pa—Palms muck, *Landform*: Drainageways on moraines, drainageways on outwash plains, drainageways on till plains, depressions on outwash plains, depressions on till plains, swamps on moraines, swamps on outwash plains, swamps on till plains, depressions on moraines, *Parent material*: Herbaceous organic material over loamy drift

MaB—Marlette fine sandy loam, *Landform*: Moraines, till plains, *Parent material*: Loamy till

CvraaB—Conover loam, *Landform*: Ground moraines, end moraines, *Parent material*: Loamy till over dense loamy till

# **Appendix D**

**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767



**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767

|  |                         |   |
|--|-------------------------|---|
| <b>Photo No.</b><br><b>3</b>             | <b>Date:</b><br>12/9/19 |  |
| <b>Direction Photo Taken:</b><br><br>N/A |                         |   |

|  |                         |  |
|--|-------------------------|--|
| <b>Photo No.</b><br><b>4</b>             | <b>Date:</b><br>12/9/19 |  |
| <b>Direction Photo Taken:</b><br><br>N/A |                         |  |

**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767



**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767

|  |   |   |
|--|---|---|
| <b>Photo No.</b><br><b>7</b>             | <b>Date:</b><br>12/9/19                                     |  |
| <b>Direction Photo Taken:</b><br><br>N/A | <b>Description:</b><br><br>DT01-MW1<br>10-15 feet bgs (2/3) |   |

|  |   |  |
|--|---|--|
| <b>Photo No.</b><br><b>8</b>             | <b>Date:</b><br>12/9/19                                     |  |
| <b>Direction Photo Taken:</b><br><br>N/A | <b>Description:</b><br><br>DT01-MW1<br>10-15 feet bgs (3/3) |  |

**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767



**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767

|   |                         |                                      |   |
|---|-------------------------|--------------------------------------|---|
| <b>Photo No.</b><br><b>11</b>                           | <b>Date:</b><br>12/9/19 | <b>Direction Photo Taken:</b><br>N/A |  |
| <b>Description:</b><br>DT01-MW1<br>15-20 feet bgs (3/3) |                         |                                      |   |

|   |                         |                                      |  |
|---|-------------------------|--------------------------------------|--|
| <b>Photo No.</b><br><b>12</b>                           | <b>Date:</b><br>12/9/19 | <b>Direction Photo Taken:</b><br>N/A |  |
| <b>Description:</b><br>DT01-MW1<br>20-25 feet bgs (1/3) |                         |                                      |  |

**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767



**Project Name:**  
Evaluation of Delhi WWTP Biosolids PFAS Evaluation

**Site Location:**  
Delhi Township, MI

**Project No.**  
60588767

|   |                         |                                      |
|---|-------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>15</b>                           | <b>Date:</b><br>12/9/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT01-MW1<br>25-30 feet bgs (1/3) |                         |                                      |



|   |                         |                                      |
|---|-------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>16</b>                           | <b>Date:</b><br>12/9/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT01-MW1<br>25-30 feet bgs (2/3) |                         |                                      |



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|  |   |                                |
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|--|---|--------------------------------|



**Project Name:**  
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**Site Location:**  
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|   |                         |
|---|-------------------------|
| <b>Photo No.</b><br><b>23</b>                           | <b>Date:</b><br>12/9/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                         |
| <b>Description:</b><br>DT01-MW1<br>35-40 feet bgs (3/3) |                         |



|   |                         |
|---|-------------------------|
| <b>Photo No.</b><br><b>24</b>                             | <b>Date:</b><br>12/9/19 |
| <b>Direction Photo Taken:</b><br>N/A                      |                         |
| <b>Description:</b><br>DT01-MW1<br>40-44.5 feet bgs (1/3) |                         |



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|                               |                         |                                      |  |  |
|-------------------------------|-------------------------|--------------------------------------|--|--|
| <b>Photo No.</b><br><b>27</b> | <b>Date:</b><br>12/9/19 | <b>Direction Photo Taken:</b><br>N/A | <b>Description:</b><br>Mateco Drilling Co. using direct-push drilling technology at location DT01-MW1. |  |
|-------------------------------|-------------------------|--------------------------------------|--|--|

|                               |                         |                                      |   |  |
|-------------------------------|-------------------------|--------------------------------------|---|--|
| <b>Photo No.</b><br><b>28</b> | <b>Date:</b><br>12/9/19 | <b>Direction Photo Taken:</b><br>N/A | <b>Description:</b><br>Total cores from DT01-MW1, shallowest at the bottom and deepest at the top.<br>0-44.5 feet bgs (1/3) |  |
|-------------------------------|-------------------------|--------------------------------------|---|--|

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|   |                         |
|---|-------------------------|
| <b>Photo No.</b><br><b>29</b>   | <b>Date:</b><br>12/9/19 |
| <b>Direction Photo Taken:</b><br>N/A  |                         |
| <b>Description:</b><br>Total cores from DT01-MW1, shallowest at the bottom and deepest at the top.<br>0-44.5 feet bgs (2/3) |                         |



|   |                         |
|---|-------------------------|
| <b>Photo No.</b><br><b>30</b>   | <b>Date:</b><br>12/9/19 |
| <b>Direction Photo Taken:</b><br>N/A  |                         |
| <b>Description:</b><br>Total cores from DT01-MW1, shallowest at the bottom and deepest at the top.<br>0-44.5 feet bgs (3/3) |                         |



|  |   |                                |
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|  |                         |   |
|--|-------------------------|---|
| <b>Photo No.</b><br><b>31</b>  | <b>Date:</b><br>12/9/19 |  |
| <b>Direction Photo Taken:</b><br><br>Southwest   |                         |   |
| <b>Description:</b><br><br>Final appearance of the yellow stick up well covers (shallow and deep wells) and the three safety bollards. |                         |   |

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|  |                          |   |
|--|--------------------------|---|
| <b>Photo No.</b><br><b>36</b>                              | <b>Date:</b><br>12/10/19 |  |
| <b>Direction Photo Taken:</b><br><br>N/A                   |                          |   |
| <b>Description:</b><br><br>DT01-MW2<br>5-10 feet bgs (3/3) |                          |   |

|   |                          |  |
|---|--------------------------|--|
| <b>Photo No.</b><br><b>37</b>                               | <b>Date:</b><br>12/10/19 |  |
| <b>Direction Photo Taken:</b><br><br>N/A                    |                          |  |
| <b>Description:</b><br><br>DT01-MW2<br>10-15 feet bgs (1/3) |                          |  |

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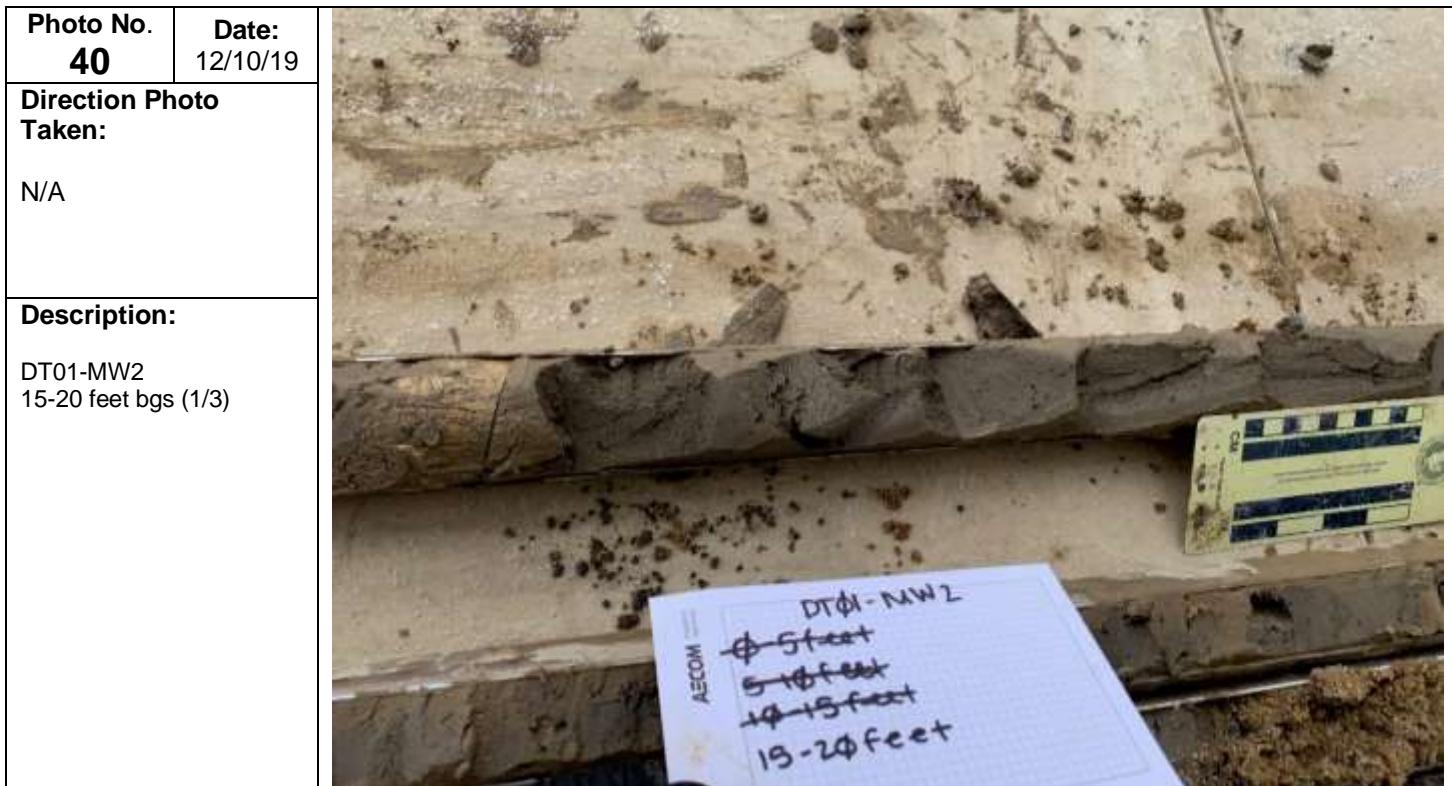
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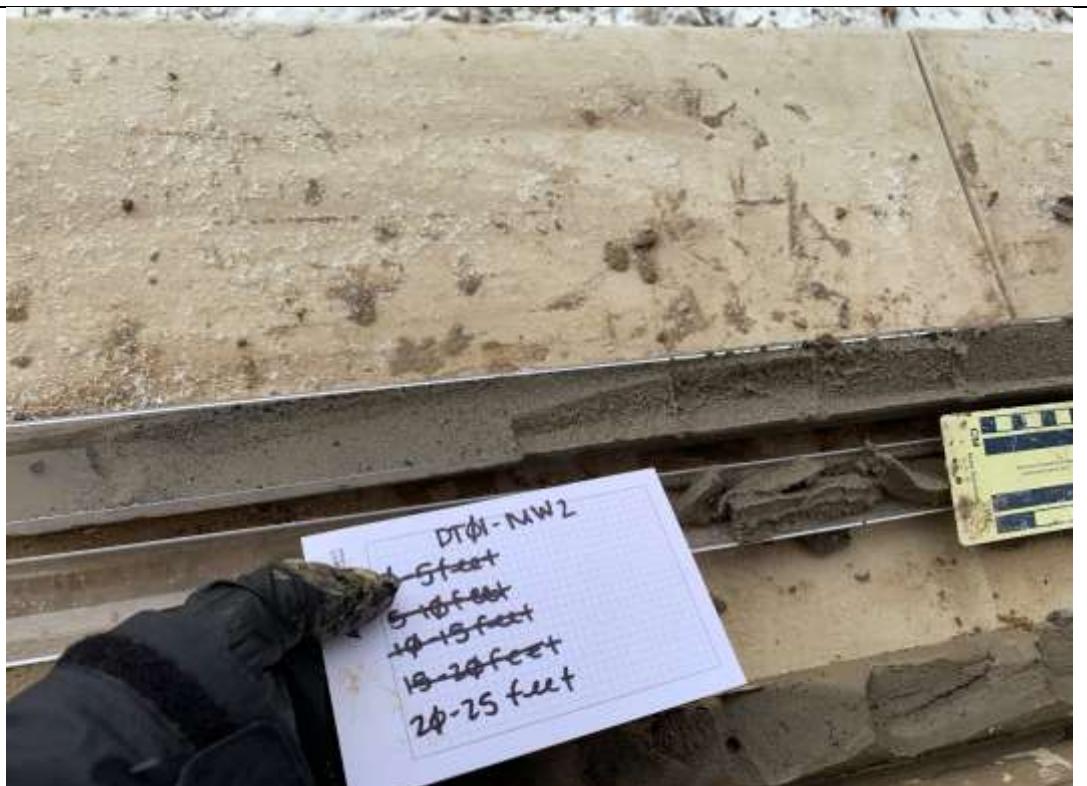
**Site Location:**  
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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>42</b>                           | <b>Date:</b><br>12/10/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT01-MW2<br>15-20 feet bgs (3/3) |                          |



|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>43</b>                           | <b>Date:</b><br>12/10/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT01-MW2<br>20-25 feet bgs (1/3) |                          |



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|  |                          |                                      |
|--|--------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>44</b>  | <b>Date:</b><br>12/10/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT01-MW2<br>20-25 feet bgs (2/3)<br><br> |                          |                                      |

|   |                          |                                      |
|---|--------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>45</b>   | <b>Date:</b><br>12/10/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT01-MW2<br>20-25 feet bgs (3/3)<br><br> |                          |                                      |

|  |  |                                |
|--|--|--------------------------------|
| <b>Project Name:</b><br>Evaluation of Delhi WWTP Biosolids PFAS Evaluation | <b>Site Location:</b><br>Delhi TWP, MI | <b>Project No.</b><br>60588767 |
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|                                      |   |   |
|--------------------------------------|---|---|
| <b>Photo No.</b><br><b>48</b>        | <b>Date:</b><br>12/10/19                                | <br>DT01-MW2<br>25-30 feet bgs (3/3) |
| <b>Direction Photo Taken:</b><br>N/A | <b>Description:</b><br>DT01-MW2<br>25-30 feet bgs (3/3) |   |

|                                      |   |  |
|--------------------------------------|---|--|
| <b>Photo No.</b><br><b>49</b>        | <b>Date:</b><br>12/10/19                                | <br>DT01-MW2<br>30-35 feet bgs (1/3) |
| <b>Direction Photo Taken:</b><br>N/A | <b>Description:</b><br>DT01-MW2<br>30-35 feet bgs (1/3) |  |

|  |  |                                |
|--|--|--------------------------------|
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|  |                          |                                      |
|--|--------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>52</b>                              | <b>Date:</b><br>12/10/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT01-MW2<br>35-39.25 feet bgs (1/3) |                          |                                      |



|  |                          |                                      |
|--|--------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>53</b>                              | <b>Date:</b><br>12/10/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT01-MW2<br>35-39.25 feet bgs (2/3) |                          |                                      |



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|  |                          |   |
|--|--------------------------|---|
| <b>Photo No.</b><br><b>54</b>                                  | <b>Date:</b><br>12/10/19 |  |
| <b>Direction Photo Taken:</b><br><br>N/A                       |                          |   |
| <b>Description:</b><br><br>DT01-MW2<br>35-39.25 feet bgs (3/3) |                          |   |

|  |                          |  |
|--|--------------------------|--|
| <b>Photo No.</b><br><b>55</b>  | <b>Date:</b><br>12/10/19 |  |
| <b>Direction Photo Taken:</b><br><br>Southeast   |                          |  |
| <b>Description:</b><br><br>Mateco Drilling Co. using direct-push drilling technology at location DT01-MW2. |                          |  |

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|   |                          |                                      |   |
|---|--------------------------|--------------------------------------|---|
| <b>Photo No.</b><br><b>62</b>                           | <b>Date:</b><br>12/11/19 | <b>Direction Photo Taken:</b><br>N/A |  |
| <b>Description:</b><br>DT02-MW1<br>10-15 feet bgs (1/2) |                          |                                      |   |

|   |                          |                                      |  |
|---|--------------------------|--------------------------------------|--|
| <b>Photo No.</b><br><b>63</b>                           | <b>Date:</b><br>12/11/19 | <b>Direction Photo Taken:</b><br>N/A |  |
| <b>Description:</b><br>DT02-MW1<br>10-15 feet bgs (2/2) |                          |                                      |  |

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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>66</b>                           | <b>Date:</b><br>12/11/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW1<br>20-25 feet bgs (1/3) |                          |



|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>67</b>                           | <b>Date:</b><br>12/11/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW1<br>20-25 feet bgs (2/3) |                          |



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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>70</b>                           | <b>Date:</b><br>12/11/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW1<br>25-30 feet bgs (2/3) |                          |



|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>71</b>                           | <b>Date:</b><br>12/11/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW1<br>25-30 feet bgs (3/3) |                          |



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|   |                          |                                      |
|---|--------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>72</b>                           | <b>Date:</b><br>12/11/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT02-MW1<br>30-35 feet bgs (1/3) |                          |                                      |



|   |                          |                                      |
|---|--------------------------|--------------------------------------|
| <b>Photo No.</b><br><b>73</b>                           | <b>Date:</b><br>12/11/19 | <b>Direction Photo Taken:</b><br>N/A |
| <b>Description:</b><br>DT02-MW1<br>30-35 feet bgs (2/3) |                          |                                      |



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**Site Location:**  
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**Photo No.** **76**    **Date:** 12/12/19

**Direction Photo Taken:**

N/A

**Description:**

DT02-MW2  
0-5 feet bgs (1/3)



**Photo No.** **77**    **Date:** 12/12/19

**Direction Photo Taken:**

N/A

**Description:**

DT02-MW2  
0-5 feet bgs (2/3)



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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>78</b>                         | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                  |                          |
| <b>Description:</b><br>DT02-MW2<br>0-5 feet bgs (3/3) |                          |



|  |                          |
|--|--------------------------|
| <b>Photo No.</b><br><b>79</b>                          | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                   |                          |
| <b>Description:</b><br>DT02-MW2<br>5-10 feet bgs (1/3) |                          |



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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>82</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>10-13 feet bgs (1/3) |                          |



|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>83</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>10-13 feet bgs (2/3) |                          |



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|   |                          |  |
|---|--------------------------|--|
| <b>Photo No.</b><br><b>84</b>                               | <b>Date:</b><br>12/12/19 | <br>A photograph showing a soil sample in a metal tray. A yellow tape measure is placed horizontally across the top of the sample. Below the sample, a white evidence tag is visible, handwritten with "DT02-MW2", "0-5 feet", "5-10 feet", "10-13 feet", and "13". |
| <b>Direction Photo Taken:</b><br><br>N/A                    |                          |  |
| <b>Description:</b><br><br>DT02-MW2<br>10-13 feet bgs (3/3) |                          |  |

|   |                          |   |
|---|--------------------------|---|
| <b>Photo No.</b><br><b>85</b>                               | <b>Date:</b><br>12/12/19 | <br>A photograph showing a soil sample in a metal tray. A yellow tape measure is placed horizontally across the top of the sample. Below the sample, a white evidence tag is visible, handwritten with "DT02-MW2", "0-5 feet", "5-10 feet", "10-15 feet", "13-18 feet", and "18". |
| <b>Direction Photo Taken:</b><br><br>N/A                    |                          |   |
| <b>Description:</b><br><br>DT02-MW2<br>13-18 feet bgs (1/3) |                          |   |

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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>86</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>13-18 feet bgs (2/3) |                          |



|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>87</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>13-18 feet bgs (3/3) |                          |

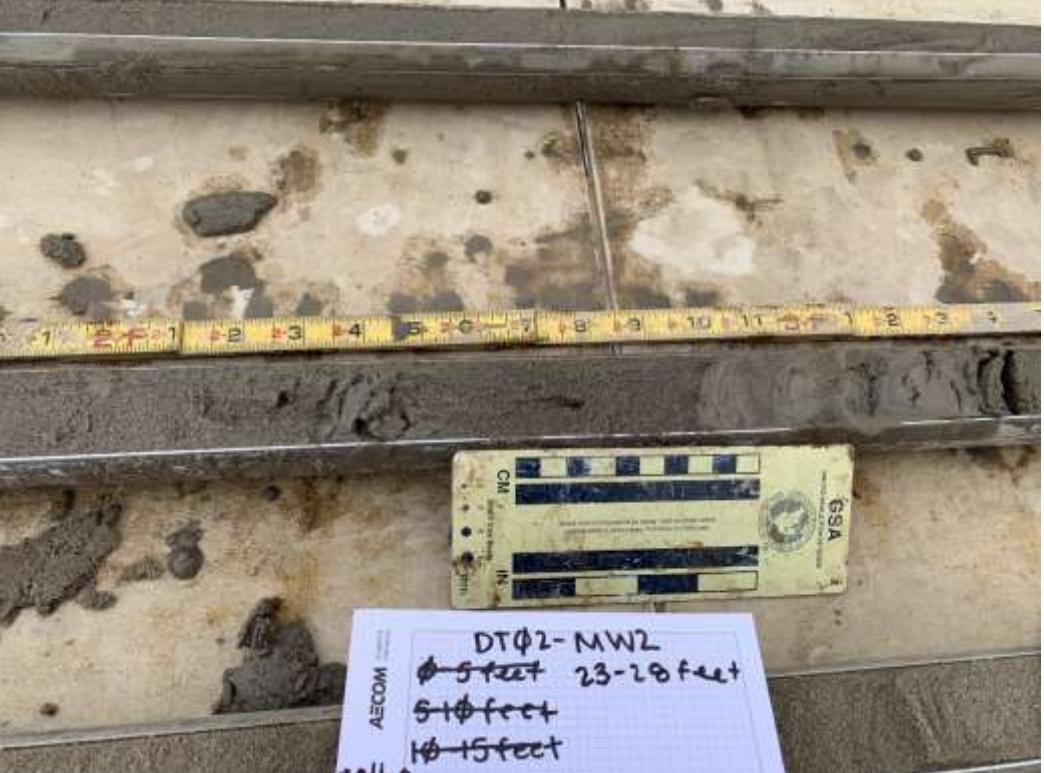


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|  |                          |   |
|--|--------------------------|---|
| <b>Photo No.</b><br><b>88</b>  | <b>Date:</b><br>12/12/19 |  |
| <b>Direction Photo Taken:</b><br><br>N/A   |                          |   |
| <b>Description:</b><br><br>DT02-MW2<br>*23-28 feet bgs (1/3)<br><br>*18-23 ft bgs interval not recovered |                          |   |

|   |                          |  |
|---|--------------------------|--|
| <b>Photo No.</b><br><b>89</b>                               | <b>Date:</b><br>12/12/19 |  |
| <b>Direction Photo Taken:</b><br><br>N/A                    |                          |  |
| <b>Description:</b><br><br>DT02-MW2<br>23-28 feet bgs (2/3) |                          |  |

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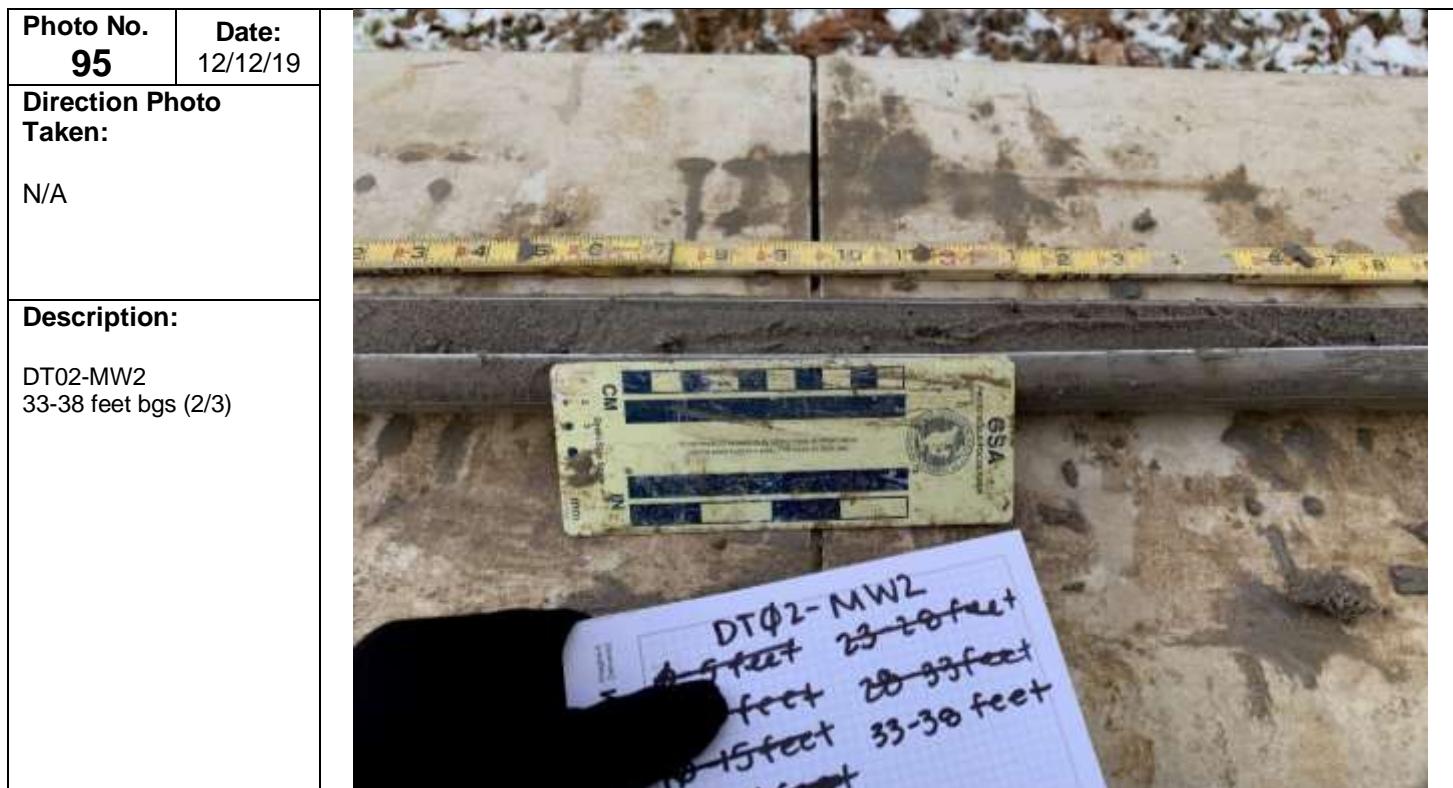
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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>96</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>33-38 feet bgs (3/3) |                          |



|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>97</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>38-43 feet bgs (1/3) |                          |



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|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>98</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>38-43 feet bgs (2/3) |                          |



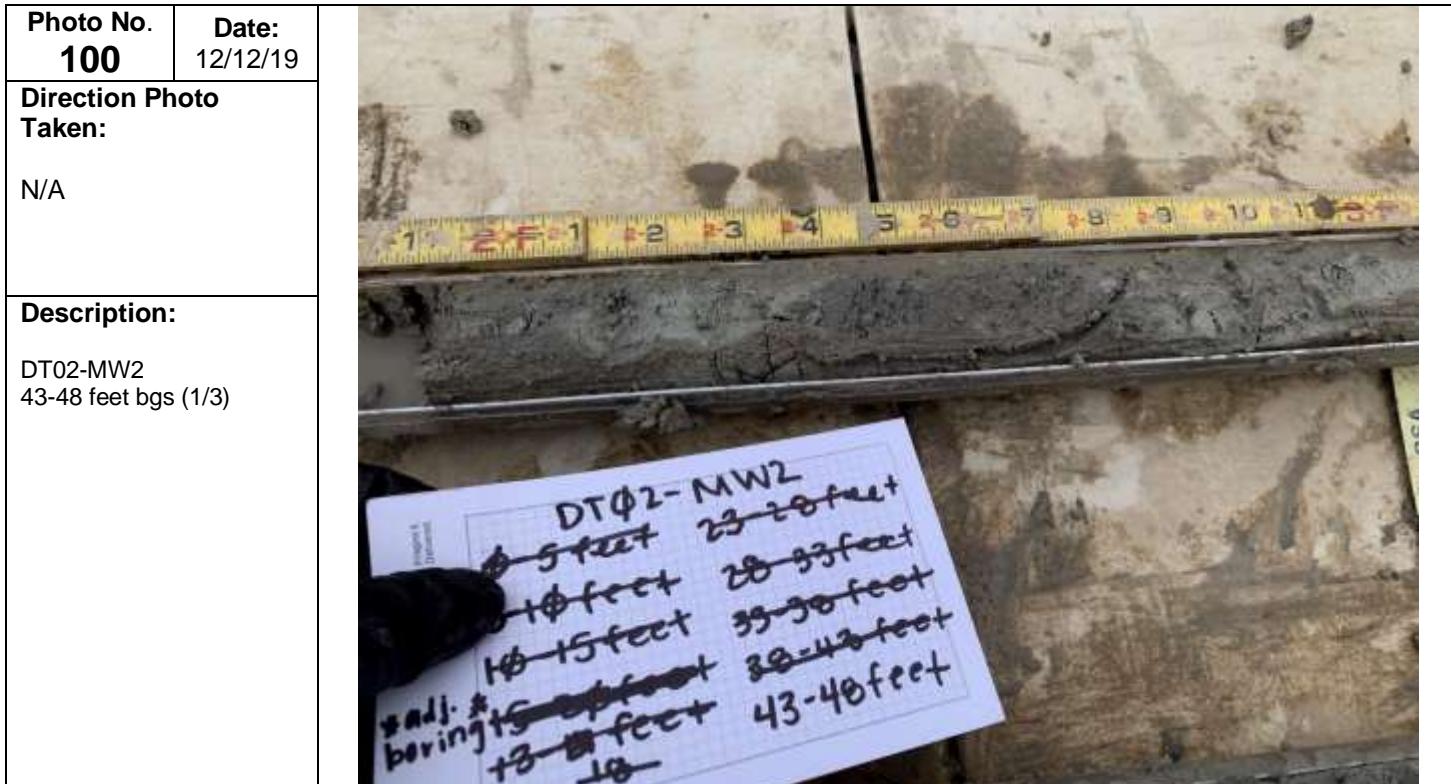
|   |                          |
|---|--------------------------|
| <b>Photo No.</b><br><b>99</b>                           | <b>Date:</b><br>12/12/19 |
| <b>Direction Photo Taken:</b><br>N/A                    |                          |
| <b>Description:</b><br>DT02-MW2<br>38-43 feet bgs (3/3) |                          |



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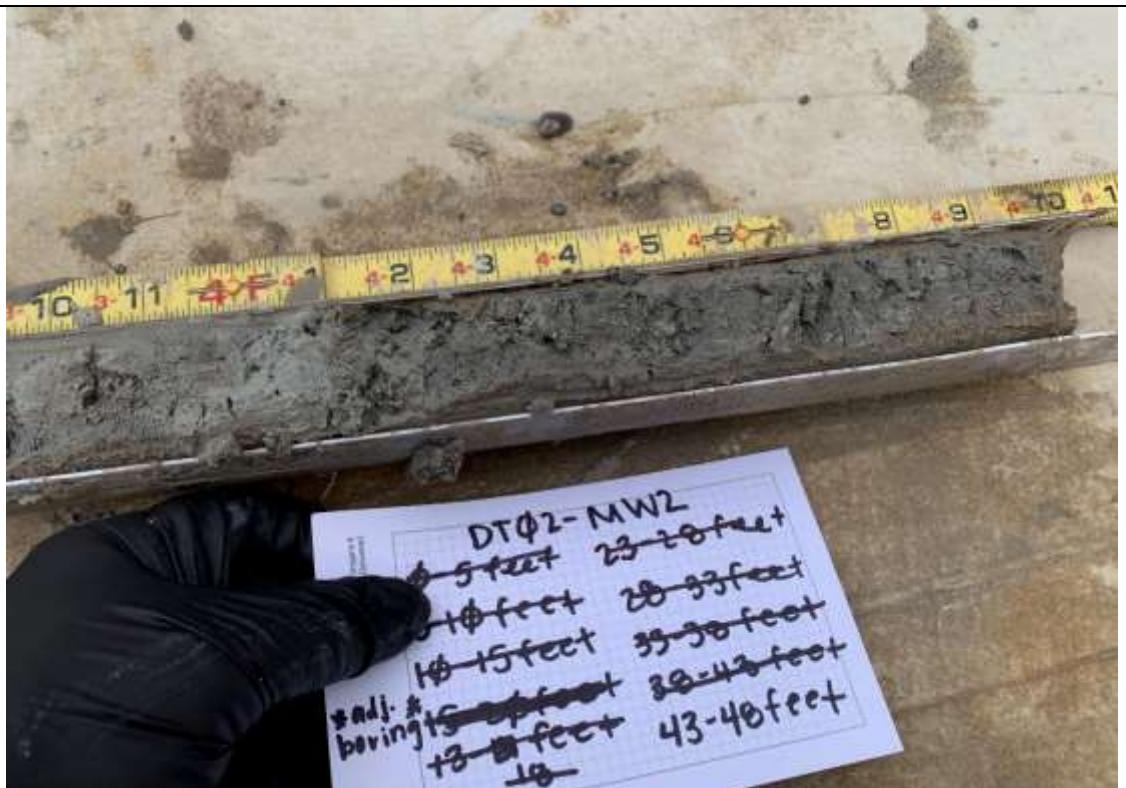
**Photo No.**  
**102**      **Date:**  
12/12/19

**Direction Photo  
Taken:**

N/A

**Description:**

DT02-MW2  
43-48 feet bgs (3/3)



**Photo No.**  
**103**      **Date:**  
12/12/19

**Direction Photo  
Taken:**

Southeast

**Description:**

Mateco Drilling Co. using direct-push drilling technology at location DT02-MW2.



# Appendix E



May 02, 2019

**Vista Work Order No. 1900730**

Ms. Maya Murshak  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on April 11, 2019 under your Project Name 'Statewide WWTP Biosolids PFAS Evaluation'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

**Vista Work Order No. 1900730****Case Narrative****Sample Condition on Receipt:**

Three aqueous samples and four solid samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

**Analytical Notes:****PFAS Isotope Dilution Method**

The aqueous samples were extracted and analyzed for a selected list of PFAS using Vista's PFAS Isotope Dilution Method. This method is listed on Vista's NELAP certificate as Modified EPA Method 537. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

The samples contained particulate and were centrifuged prior to extraction.

**Holding Times**

The samples were extracted and analyzed within the method hold times.

**Quality Control**

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The recoveries of 6:2 FTS and 8:2 FTS were greater than 130% in the OPR. These analytes were not detected in the samples. The recoveries of all other analytes were within the method acceptance criteria.

The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

**VAL-PFAS Method**

The solid samples were extracted and analyzed for a selected list of PFAS using VAL Method PFAS. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

**Holding Times**

The samples were extracted and analyzed within the hold times.

## Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside of the acceptance criteria are listed in the table below.

QC Anomalies

| LabNumber  | SampleName        | Analysis   | Analyte     | Flag | %Rec |
|------------|-------------------|------------|-------------|------|------|
| 1900730-04 | SXDU21904091155MK | VAL - PFAS | 13C2-PFTeDA | H    | 19.6 |

H = Recovery was outside laboratory acceptance criteria.

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# Sample Inventory Report

| Vista Sample ID | Client Sample ID  | Sampled         | Received        | Components/Containers |
|-----------------|-------------------|-----------------|-----------------|-----------------------|
| 1900730-01      | SW011904091015RL  | 09-Apr-19 10:15 | 11-Apr-19 09:35 | HDPE Bottle, 250 mL   |
| 1900730-02      | SXDU11904091050MK | 09-Apr-19 10:50 | 11-Apr-19 09:35 | HDPE Jar, 6 oz        |
| 1900730-03      | SW031904091125RL  | 09-Apr-19 11:25 | 11-Apr-19 09:35 | HDPE Bottle, 250 mL   |
| 1900730-04      | SXDU21904091155MK | 09-Apr-19 11:55 | 11-Apr-19 09:35 | HDPE Jar, 6 oz        |
| 1900730-05      | SW041904091255RL  | 09-Apr-19 12:55 | 11-Apr-19 09:35 | HDPE Bottle, 250 mL   |
| 1900730-06      | SXDU21904091300MK | 09-Apr-19 13:00 | 11-Apr-19 09:35 | HDPE Jar, 6 oz        |
| 1900730-07      | SXDU11904091350MK | 09-Apr-19 13:50 | 11-Apr-19 09:35 | HDPE Jar, 6 oz        |

## **ANALYTICAL RESULTS**

| Sample ID: Method Blank |                          |              |          |                 |            |            |           |             |                 | PFAS Isotope Dilution Method |          |         |  |
|-------------------------|--------------------------|--------------|----------|-----------------|------------|------------|-----------|-------------|-----------------|------------------------------|----------|---------|--|
| Client Data             |                          |              |          | Laboratory Data |            |            |           |             |                 |                              |          |         |  |
| Name:                   | Merit Laboratories, Inc. |              |          | Matrix:         | Aqueous    |            |           | Lab Sample: | B9D0139-BLK1    |                              | Column:  | BEH C18 |  |
| Analyte                 | CAS Number               | Conc. (ng/L) | DL       | LOD             | LOQ        | Qualifiers | Batch     | Extracted   | Samp Size       | Analyzed                     | Dilution |         |  |
| PFBA                    | 375-22-4                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFPeA                   | 2706-90-3                | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFBS                    | 375-73-5                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| 4:2 FTS                 | 757124-72-4              | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFHxA                   | 307-24-4                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFPeS                   | 2706-91-4                | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFHpA                   | 375-85-9                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFHxS                   | 355-46-4                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| 6:2 FTS                 | 27619-97-2               | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFOA                    | 335-67-1                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFHpS                   | 375-92-8                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFNA                    | 375-95-1                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFOSA                   | 754-91-6                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFOS                    | 1763-23-1                | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFDA                    | 335-76-2                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| 8:2 FTS                 | 39108-34-4               | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFNS                    | 68259-12-1               | ND           | 1.94     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| MeFOSAA                 | 2355-31-9                | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| EtFOSAA                 | 2991-50-6                | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFUnA                   | 2058-94-8                | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFDS                    | 335-77-3                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFDoA                   | 307-55-1                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFTrDA                  | 72629-94-8               | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| PFTeDA                  | 376-06-7                 | ND           | 1.37     | 2.00            | 4.00       |            | B9D0139   | 17-Apr-19   | 0.250 L         | 19-Apr-19 00:30              | 1        |         |  |
| Labeled Standards       | Type                     | % Recovery   | Limits   |                 | Qualifiers | Batch      | Extracted | Samp Size   | Analyzed        | Dilution                     |          |         |  |
| 13C3-PFBA               | IS                       | 97.1         | 60 - 130 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C3-PFPeA              | IS                       | 96.6         | 60 - 150 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C3-PFBS               | IS                       | 96.1         | 60 - 150 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C2-4:2 FTS            | IS                       | 104          | 20 - 150 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C2-PFHxA              | IS                       | 95.2         | 70 - 130 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C4-PFHpA              | IS                       | 93.6         | 60 - 150 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C3-PFHxS              | IS                       | 94.3         | 60 - 130 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C2-6:2 FTS            | IS                       | 100          | 40 - 150 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C2-PFOA               | IS                       | 79.6         | 60 - 130 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C5-PFNA               | IS                       | 69.2         | 50 - 130 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C8-PFOSA              | IS                       | 41.1         | 20 - 150 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C8-PFOS               | IS                       | 82.4         | 60 - 130 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |
| 13C2-PFDA               | IS                       | 69.1         | 60 - 130 |                 |            | B9D0139    | 17-Apr-19 | 0.250 L     | 19-Apr-19 00:30 | 1                            |          |         |  |

| Sample ID: Method Blank |  |            |          |                 |         |           |                          | PFAS Isotope Dilution Method |          |  |                 |
|-------------------------|--|------------|----------|-----------------|---------|-----------|--------------------------|------------------------------|----------|--|-----------------|
| Client Data             |  |            |          | Laboratory Data |         |           |                          |                              |          |  |                 |
| Name:                   | Merit Laboratories, Inc.                 |            |          | Matrix:         | Aqueous |           | Lab Sample: B9D0139-BLK1 |                              |          |  | Column: BEH C18 |
| Project:                | Statewide WWTP Biosolids PFAS Evaluation |            |          |                 |         |           |                          |                              |          |  |                 |
| Labeled Standards       | Type                                     | % Recovery | Limits   | Qualifiers      | Batch   | Extracted | Samp Size                | Analyzed                     | Dilution |  |                 |
| 13C2-8:2 FTS            | IS                                       | 86.4       | 40 - 150 |                 | B9D0139 | 17-Apr-19 | 0.250 L                  | 19-Apr-19 00:30              | 1        |  |                 |
| d3-MeFOSAA              | IS                                       | 62.3       | 50 - 150 |                 | B9D0139 | 17-Apr-19 | 0.250 L                  | 19-Apr-19 00:30              | 1        |  |                 |
| d5-EtFOSAA              | IS                                       | 65.8       | 50 - 150 |                 | B9D0139 | 17-Apr-19 | 0.250 L                  | 19-Apr-19 00:30              | 1        |  |                 |
| 13C2-PFUnA              | IS                                       | 62.5       | 60 - 130 |                 | B9D0139 | 17-Apr-19 | 0.250 L                  | 19-Apr-19 00:30              | 1        |  |                 |
| 13C2-PFDoA              | IS                                       | 63.9       | 30 - 130 |                 | B9D0139 | 17-Apr-19 | 0.250 L                  | 19-Apr-19 00:30              | 1        |  |                 |
| 13C2-PFTeDA             | IS                                       | 60.7       | 20 - 150 |                 | B9D0139 | 17-Apr-19 | 0.250 L                  | 19-Apr-19 00:30              | 1        |  |                 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

| Sample ID: OPR    |                          |                  |           |                 |          |            |           |                 |             |                 | PFAS Isotope Dilution Method |         |  |  |  |
|-------------------|--------------------------|------------------|-----------|-----------------|----------|------------|-----------|-----------------|-------------|-----------------|------------------------------|---------|--|--|--|
| Client Data       |                          |                  |           | Laboratory Data |          |            |           |                 |             |                 |                              |         |  |  |  |
| Name:             | Merit Laboratories, Inc. |                  |           | Matrix:         | Aqueous  |            |           | Lab Sample:     | B9D0139-BS1 |                 | Column:                      | BEH C18 |  |  |  |
| Analyte           | CAS Number               | Amt Found (ng/L) | Spike Amt | % Rec           | Limits   | Qualifiers | Batch     | Extracted       | Samp Size   | Analyzed        | Dilution                     |         |  |  |  |
| PFBA              | 375-22-4                 | 38.6             | 40.0      | 96.5            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFPeA             | 2706-90-3                | 39.3             | 40.0      | 98.3            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFBS              | 375-73-5                 | 38.8             | 40.0      | 97.1            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| 4:2 FTS           | 757124-72-4              | 37.9             | 40.0      | 94.8            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFHxA             | 307-24-4                 | 40.7             | 40.0      | 102             | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFPeS             | 2706-91-4                | 36.3             | 40.0      | 90.6            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFHpA             | 375-85-9                 | 37.2             | 40.0      | 93.1            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFHxS             | 355-46-4                 | 37.8             | 40.0      | 94.5            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| 6:2 FTS           | 27619-97-2               | 38.1             | 40.0      | 95.1            | 60 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFOA              | 335-67-1                 | 38.6             | 40.0      | 96.6            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFHps             | 375-92-8                 | 41.6             | 40.0      | 104             | 60 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFNA              | 375-95-1                 | 42.7             | 40.0      | 107             | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFOSA             | 754-91-6                 | 38.0             | 40.0      | 95.1            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFOS              | 1763-23-1                | 37.8             | 40.0      | 94.5            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFDA              | 335-76-2                 | 39.7             | 40.0      | 99.2            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| 8:2 FTS           | 39108-34-4               | 43.3             | 40.0      | 108             | 60 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFNS              | 68259-12-1               | 35.8             | 40.0      | 89.6            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| MeFOSAA           | 2355-31-9                | 37.3             | 40.0      | 93.2            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| EtFOSAA           | 2991-50-6                | 37.1             | 40.0      | 92.9            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFUnA             | 2058-94-8                | 42.1             | 40.0      | 105             | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFDS              | 335-77-3                 | 36.8             | 40.0      | 92.0            | 60 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFDoA             | 307-55-1                 | 39.2             | 40.0      | 98.1            | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFTrDA            | 72629-94-8               | 40.1             | 40.0      | 100             | 60 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| PFTeDA            | 376-06-7                 | 40.2             | 40.0      | 100             | 70 - 130 |            | B9D0139   | 17-Apr-19       | 0.250 L     | 19-Apr-19 00:20 | 1                            |         |  |  |  |
| Labeled Standards | Type                     | % Rec            | Limits    | Qualifiers      | Batch    | Extracted  | Samp Size | Analyzed        | Dilution    |                 |                              |         |  |  |  |
| 13C3-PFBA         | IS                       | 98.8             | 60 - 130  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C3-PFPeA        | IS                       | 95.3             | 60 - 150  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C3-PFBS         | IS                       | 96.7             | 60 - 150  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C2-4:2 FTS      | IS                       | 95.8             | 20 - 150  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C2-PFHxA        | IS                       | 99.1             | 70 - 130  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C4-PFHpA        | IS                       | 98.8             | 60 - 150  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C3-PFHxS        | IS                       | 90.9             | 60 - 130  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C2-6:2 FTS      | IS                       | 108              | 40 - 150  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C2-PFOA         | IS                       | 85.8             | 60 - 130  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |
| 13C5-PFNA         | IS                       | 68.8             | 50 - 130  |                 | B9D0139  | 17-Apr-19  | 0.250 L   | 19-Apr-19 00:20 | 1           |                 |                              |         |  |  |  |

| Sample ID: OPR    |  |         |         |                 |             |           |           | PFAS Isotope Dilution Method |          |  |
|-------------------|--|---------|---------|-----------------|-------------|-----------|-----------|------------------------------|----------|--|
| Client Data       |  |         |         | Laboratory Data |             |           |           |                              |          |  |
| Name:             | Merit Laboratories, Inc.                 | Matrix: | Aqueous | Lab Sample:     | B9D0139-BS1 | Column:   | BEH C18   |                              |          |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation |         |         |                 |             |           |           |                              |          |  |
| Labeled Standards | Type                                     | % Rec   | Limits  | Qualifiers      | Batch       | Extracted | Samp Size | Analyzed                     | Dilution |  |
| 13C8-PFOSA        | IS                                       | 41.6    | 20- 150 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| 13C8-PFOS         | IS                                       | 84.6    | 60- 130 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| 13C2-PFDA         | IS                                       | 74.6    | 60- 130 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| 13C2-8:2 FTS      | IS                                       | 85.0    | 40- 150 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| d3-MeFOSAA        | IS                                       | 68.7    | 50- 150 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| d5-EtFOSAA        | IS                                       | 68.0    | 50- 150 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| 13C2-PFUnA        | IS                                       | 67.4    | 60- 130 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| 13C2-PFDoA        | IS                                       | 70.4    | 30- 130 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |
| 13C2-PFTeDA       | IS                                       | 58.1    | 20- 150 |                 | B9D0139     | 17-Apr-19 | 0.250 L   | 19-Apr-19 00:20              | 1        |  |

**Sample ID: SW011904091015RL**
**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |                |                 |            |           |           |                 |                 |          |  |  |  |  |
|-------------------|--|-----------------|-----------------|----------------|-----------------|------------|-----------|-----------|-----------------|-----------------|----------|--|--|--|--|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample:    | 1900730-01      | Column:    | BEH C18   |           |                 |                 |          |  |  |  |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 09-Apr-19 10:15 | Date Received: | 11-Apr-19 09:35 |            |           |           |                 |                 |          |  |  |  |  |
| Location:         | DELH-03N02W29-DT01                       |                 |                 |                |                 |            |           |           |                 |                 |          |  |  |  |  |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD            | LOQ             | Qualifiers | Batch     | Extracted | Samp Size       | Analyzed        | Dilution |  |  |  |  |
| PFBA              | 375-22-4                                 | 3.32            | 1.54            | 2.25           | 4.51            | J          | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFPeA             | 2706-90-3                                | 2.76            | 1.54            | 2.25           | 4.51            | J          | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFBS              | 375-73-5                                 | 4.55            | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFHxA             | 307-24-4                                 | 2.74            | 1.54            | 2.25           | 4.51            | J          | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFPeS             | 2706-91-4                                | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFHpA             | 375-85-9                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFHxS             | 355-46-4                                 | 2.12            | 1.54            | 2.25           | 4.51            | J, Q       | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFOA              | 335-67-1                                 | 2.87            | 1.54            | 2.25           | 4.51            | J          | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFHpS             | 375-92-8                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFNA              | 375-95-1                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFOSA             | 754-91-6                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFOS              | 1763-23-1                                | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFDA              | 335-76-2                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFNS              | 68259-12-1                               | ND              | 2.18            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| MeFOSAA           | 2355-31-9                                | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| EtFOSAA           | 2991-50-6                                | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFUnA             | 2058-94-8                                | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFDS              | 335-77-3                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFDoA             | 307-55-1                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFTrDA            | 72629-94-8                               | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| PFTeDA            | 376-06-7                                 | ND              | 1.54            | 2.25           | 4.51            |            | B9D0139   | 17-Apr-19 | 0.222 L         | 19-Apr-19 03:31 | 1        |  |  |  |  |
| Labeled Standards | Type                                     | % Recovery      | Limits          |                | Qualifiers      | Batch      | Extracted | Samp Size | Analyzed        | Dilution        |          |  |  |  |  |
| 13C3-PFBA         | IS                                       | 92.0            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C3-PFPeA        | IS                                       | 93.0            | 60 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C3-PFBS         | IS                                       | 92.6            | 60 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C2-4:2 FTS      | IS                                       | 92.2            | 20 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C2-PFHxA        | IS                                       | 90.5            | 70 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C4-PFHpA        | IS                                       | 84.8            | 60 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C3-PFHxS        | IS                                       | 90.3            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C2-6:2 FTS      | IS                                       | 98.5            | 40 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C2-PFOA         | IS                                       | 90.2            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C5-PFNA         | IS                                       | 86.8            | 50 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C8-PFOSA        | IS                                       | 60.2            | 20 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C8-PFOS         | IS                                       | 90.2            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |
| 13C2-PFDA         | IS                                       | 70.2            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.222 L   | 19-Apr-19 03:31 | 1               |          |  |  |  |  |

**Sample ID:** SW011904091015RL

**PFAS Isotope Dilution Method**
**Client Data**

 Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: DELH-03N02W29-DT01

 Matrix: Aqueous  
 Date Collected: 09-Apr-19 10:15

**Laboratory Data**

 Lab Sample: 1900730-01  
 Date Received: 11-Apr-19 09:35  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 95.8 | 40 - 150 |  | B9D0139 | 17-Apr-19 | 0.222 L | 19-Apr-19 03:31 | 1 |
| d3-MeFOSAA   | IS | 67.6 | 50 - 150 |  | B9D0139 | 17-Apr-19 | 0.222 L | 19-Apr-19 03:31 | 1 |
| d5-EtFOSAA   | IS | 72.3 | 50 - 150 |  | B9D0139 | 17-Apr-19 | 0.222 L | 19-Apr-19 03:31 | 1 |
| 13C2-PFUnA   | IS | 69.8 | 60 - 130 |  | B9D0139 | 17-Apr-19 | 0.222 L | 19-Apr-19 03:31 | 1 |
| 13C2-PFDoA   | IS | 69.3 | 30 - 130 |  | B9D0139 | 17-Apr-19 | 0.222 L | 19-Apr-19 03:31 | 1 |
| 13C2-PFTeDA  | IS | 75.4 | 20 - 150 |  | B9D0139 | 17-Apr-19 | 0.222 L | 19-Apr-19 03:31 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID:** SW031904091125RL

**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |                |                 |            |           |           |                 |                 |          |  |  |  |  |
|-------------------|--|-----------------|-----------------|----------------|-----------------|------------|-----------|-----------|-----------------|-----------------|----------|--|--|--|--|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample:    | 1900730-03      | Column:    | BEH C18   |           |                 |                 |          |  |  |  |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 09-Apr-19 11:25 | Date Received: | 11-Apr-19 09:35 |            |           |           |                 |                 |          |  |  |  |  |
| Location:         | DELH-03N02W29-DT01                       |                 |                 |                |                 |            |           |           |                 |                 |          |  |  |  |  |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD            | LOQ             | Qualifiers | Batch     | Extracted | Samp Size       | Analyzed        | Dilution |  |  |  |  |
| PFBA              | 375-22-4                                 | 3.37            | 1.44            | 2.10           | 4.21            | J          | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFPeA             | 2706-90-3                                | 1.54            | 1.44            | 2.10           | 4.21            | J          | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFBS              | 375-73-5                                 | 1.66            | 1.44            | 2.10           | 4.21            | J          | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFHxA             | 307-24-4                                 | 1.55            | 1.44            | 2.10           | 4.21            | J          | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFPeS             | 2706-91-4                                | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFHpA             | 375-85-9                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFHxS             | 355-46-4                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFOA              | 335-67-1                                 | 1.59            | 1.44            | 2.10           | 4.21            | J          | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFHpS             | 375-92-8                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFNA              | 375-95-1                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFOSA             | 754-91-6                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFOS              | 1763-23-1                                | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFDA              | 335-76-2                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFNS              | 68259-12-1                               | ND              | 2.04            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| MeFOSAA           | 2355-31-9                                | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| EtFOSAA           | 2991-50-6                                | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFUnA             | 2058-94-8                                | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFDS              | 335-77-3                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFDoA             | 307-55-1                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFTrDA            | 72629-94-8                               | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| PFTeDA            | 376-06-7                                 | ND              | 1.44            | 2.10           | 4.21            |            | B9D0139   | 17-Apr-19 | 0.238 L         | 19-Apr-19 03:41 | 1        |  |  |  |  |
| Labeled Standards | Type                                     | % Recovery      | Limits          |                | Qualifiers      | Batch      | Extracted | Samp Size | Analyzed        | Dilution        |          |  |  |  |  |
| 13C3-PFBA         | IS                                       | 91.8            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C3-PFPeA        | IS                                       | 93.5            | 60 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C3-PFBS         | IS                                       | 96.8            | 60 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C2-4:2 FTS      | IS                                       | 95.9            | 20 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C2-PFHxA        | IS                                       | 91.0            | 70 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C4-PFHpA        | IS                                       | 94.5            | 60 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C3-PFHxS        | IS                                       | 89.9            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C2-6:2 FTS      | IS                                       | 96.1            | 40 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C2-PFOA         | IS                                       | 90.1            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C5-PFNA         | IS                                       | 76.6            | 50 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C8-PFOSA        | IS                                       | 55.6            | 20 - 150        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C8-PFOS         | IS                                       | 88.5            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |
| 13C2-PFDA         | IS                                       | 85.8            | 60 - 130        |                |                 | B9D0139    | 17-Apr-19 | 0.238 L   | 19-Apr-19 03:41 | 1               |          |  |  |  |  |

**Sample ID:** SW031904091125RL

**PFAS Isotope Dilution Method**
**Client Data**

 Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: DELH-03N02W29-DT01

 Matrix: Aqueous  
 Date Collected: 09-Apr-19 11:25

**Laboratory Data**

 Lab Sample: 1900730-03  
 Date Received: 11-Apr-19 09:35  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 90.5 | 40 - 150 |  | B9D0139 | 17-Apr-19 | 0.238 L | 19-Apr-19 03:41 | 1 |
| d3-MeFOSAA   | IS | 76.6 | 50 - 150 |  | B9D0139 | 17-Apr-19 | 0.238 L | 19-Apr-19 03:41 | 1 |
| d5-EtFOSAA   | IS | 76.0 | 50 - 150 |  | B9D0139 | 17-Apr-19 | 0.238 L | 19-Apr-19 03:41 | 1 |
| 13C2-PFUnA   | IS | 75.5 | 60 - 130 |  | B9D0139 | 17-Apr-19 | 0.238 L | 19-Apr-19 03:41 | 1 |
| 13C2-PFDaA   | IS | 73.3 | 30 - 130 |  | B9D0139 | 17-Apr-19 | 0.238 L | 19-Apr-19 03:41 | 1 |
| 13C2-PFTeDA  | IS | 78.5 | 20 - 150 |  | B9D0139 | 17-Apr-19 | 0.238 L | 19-Apr-19 03:41 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: SW041904091255RL**
**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |                        |                 |            |           |                 |                 |                 |          |
|-------------------|--|-----------------|-----------------|------------------------|-----------------|------------|-----------|-----------------|-----------------|-----------------|----------|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample: 1900730-05 |                 |            |           | Column: BEH C18 |                 |                 |          |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 09-Apr-19 12:55 | Date Received:         | 11-Apr-19 09:35 |            |           |                 |                 |                 |          |
| Location:         | DELH-03N02W29-DT01                       |                 |                 |                        |                 |            |           |                 |                 |                 |          |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD                    | LOQ             | Qualifiers | Batch     | Extracted       | Samp Size       | Analyzed        | Dilution |
| PFBA              | 375-22-4                                 | 1.65            | 1.51            | 2.20                   | 4.41            | J          | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFPeA             | 2706-90-3                                | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFBS              | 375-73-5                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFHxA             | 307-24-4                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFPeS             | 2706-91-4                                | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFHpA             | 375-85-9                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFHxS             | 355-46-4                                 | 2.79            | 1.51            | 2.20                   | 4.41            | J          | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFOA              | 335-67-1                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFHpS             | 375-92-8                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFNA              | 375-95-1                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFOSA             | 754-91-6                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFOS              | 1763-23-1                                | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFDA              | 335-76-2                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFNS              | 68259-12-1                               | ND              | 2.13            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| MeFOSAA           | 2355-31-9                                | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| EtFOSAA           | 2991-50-6                                | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFUnA             | 2058-94-8                                | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFDS              | 335-77-3                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFDoA             | 307-55-1                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFTrDA            | 72629-94-8                               | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| PFTeDA            | 376-06-7                                 | ND              | 1.51            | 2.20                   | 4.41            |            | B9D0139   | 17-Apr-19       | 0.227 L         | 19-Apr-19 03:52 | 1        |
| Labeled Standards | Type                                     | % Recovery      | Limits          |                        | Qualifiers      | Batch      | Extracted | Samp Size       | Analyzed        | Dilution        |          |
| 13C3-PFBA         | IS                                       | 95.2            | 60 - 130        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C3-PFPeA        | IS                                       | 90.5            | 60 - 150        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C3-PFBS         | IS                                       | 93.2            | 60 - 150        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C2-4:2 FTS      | IS                                       | 98.0            | 20 - 150        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C2-PFHxA        | IS                                       | 92.1            | 70 - 130        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C4-PFHpA        | IS                                       | 92.0            | 60 - 150        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C3-PFHxS        | IS                                       | 89.0            | 60 - 130        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C2-6:2 FTS      | IS                                       | 101             | 40 - 150        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C2-PFOA         | IS                                       | 94.3            | 60 - 130        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C5-PFNA         | IS                                       | 82.4            | 50 - 130        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C8-PFOSA        | IS                                       | 58.1            | 20 - 150        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C8-PFOS         | IS                                       | 93.5            | 60 - 130        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |
| 13C2-PFDA         | IS                                       | 81.4            | 60 - 130        |                        |                 | B9D0139    | 17-Apr-19 | 0.227 L         | 19-Apr-19 03:52 | 1               |          |

**Sample ID:** SW041904091255RL

**PFAS Isotope Dilution Method**
**Client Data**

 Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: DELH-03N02W29-DT01

 Matrix: Aqueous  
 Date Collected: 09-Apr-19 12:55

**Laboratory Data**

 Lab Sample: 1900730-05  
 Date Received: 11-Apr-19 09:35  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 98.4 | 40 - 150 |  | B9D0139 | 17-Apr-19 | 0.227 L | 19-Apr-19 03:52 | 1 |
| d3-MeFOSAA   | IS | 65.0 | 50 - 150 |  | B9D0139 | 17-Apr-19 | 0.227 L | 19-Apr-19 03:52 | 1 |
| d5-EtFOSAA   | IS | 75.7 | 50 - 150 |  | B9D0139 | 17-Apr-19 | 0.227 L | 19-Apr-19 03:52 | 1 |
| 13C2-PFUnA   | IS | 71.6 | 60 - 130 |  | B9D0139 | 17-Apr-19 | 0.227 L | 19-Apr-19 03:52 | 1 |
| 13C2-PFDaA   | IS | 72.0 | 30 - 130 |  | B9D0139 | 17-Apr-19 | 0.227 L | 19-Apr-19 03:52 | 1 |
| 13C2-PFTeDA  | IS | 80.5 | 20 - 150 |  | B9D0139 | 17-Apr-19 | 0.227 L | 19-Apr-19 03:52 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

| Sample ID: Method Blank |                          |              |          |                 |            |             |              |           |                 | VAL - PFAS      |          |
|-------------------------|--------------------------|--------------|----------|-----------------|------------|-------------|--------------|-----------|-----------------|-----------------|----------|
| Client Data             |                          |              |          | Laboratory Data |            |             |              |           |                 |                 |          |
| Name:                   | Merit Laboratories, Inc. |              |          | Matrix:         | Solid      | Lab Sample: | B9D0148-BLK1 |           | Column:         | BEH C18         |          |
| Analyte                 | CAS Number               | Conc. (ng/g) | DL       | LOD             | LOQ        | Qualifiers  | Batch        | Extracted | Samp Size       | Analyzed        | Dilution |
| PFBA                    | 375-22-4                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFPeA                   | 2706-90-3                | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFBS                    | 375-73-5                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| 4:2 FTS                 | 757124-72-4              | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFHxA                   | 307-24-4                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFPeS                   | 2706-91-4                | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFHpA                   | 375-85-9                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFHxS                   | 355-46-4                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| 6:2 FTS                 | 27619-97-2               | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFOA                    | 335-67-1                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFHpS                   | 375-92-8                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFNA                    | 375-95-1                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFOSA                   | 754-91-6                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFOS                    | 1763-23-1                | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFDA                    | 335-76-2                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| 8:2 FTS                 | 39108-34-4               | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFNS                    | 68259-12-1               | ND           | 1.43     | 1.50            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| MeFOSAA                 | 2355-31-9                | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| EtFOSAA                 | 2991-50-6                | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFUnA                   | 2058-94-8                | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFDS                    | 335-77-3                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFDoA                   | 307-55-1                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFTrDA                  | 72629-94-8               | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| PFTeDA                  | 376-06-7                 | ND           | 0.845    | 1.00            | 2.00       |             | B9D0148      | 25-Apr-19 | 1.00 g          | 30-Apr-19 01:30 | 1        |
| Labeled Standards       | Type                     | % Recovery   | Limits   |                 | Qualifiers | Batch       | Extracted    | Samp Size | Analyzed        | Dilution        |          |
| 13C3-PFBA               | IS                       | 94.3         | 60 - 130 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C3-PFPeA              | IS                       | 87.5         | 60 - 150 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C3-PFBS               | IS                       | 97.6         | 60 - 150 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C2-4:2 FTS            | IS                       | 107          | 40 - 150 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C2-PFHxA              | IS                       | 89.5         | 70 - 130 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C4-PFHpA              | IS                       | 90.6         | 60 - 150 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C3-PFHxS              | IS                       | 97.6         | 60 - 130 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C2-6:2 FTS            | IS                       | 105          | 40 - 150 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C2-PFOA               | IS                       | 87.7         | 60 - 130 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C5-PFNA               | IS                       | 78.1         | 50 - 130 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C8-PFOSA              | IS                       | 42.1         | 20 - 150 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C8-PFOS               | IS                       | 87.3         | 60 - 130 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |
| 13C2-PFDA               | IS                       | 78.1         | 60 - 130 |                 |            | B9D0148     | 25-Apr-19    | 1.00 g    | 30-Apr-19 01:30 | 1               |          |

**Sample ID: Method Blank**
**VAL - PFAS**

| Client Data |  |         |       | Laboratory Data |              |         |         |  |  |  |
|-------------|--|---------|-------|-----------------|--------------|---------|---------|--|--|--|
| Name:       | Merit Laboratories, Inc.                 | Matrix: | Solid | Lab Sample:     | B9D0148-BLK1 | Column: | BEH C18 |  |  |  |
| Project:    | Statewide WWTP Biosolids PFAS Evaluation |         |       |                 |              |         |         |  |  |  |

| Labeled Standards | Type | % Recovery | Limits   | Qualifiers | Batch   | Extracted | Samp Size | Analyzed        | Dilution |
|-------------------|------|------------|----------|------------|---------|-----------|-----------|-----------------|----------|
| 13C2-8:2 FTS      | IS   | 93.2       | 40 - 150 |            | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:30 | 1        |
| d3-MeFOSAA        | IS   | 72.2       | 50 - 150 |            | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:30 | 1        |
| d5-EtFOSAA        | IS   | 68.4       | 50 - 150 |            | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:30 | 1        |
| 13C2-PFUnA        | IS   | 64.2       | 60 - 130 |            | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:30 | 1        |
| 13C2-PFDoA        | IS   | 52.0       | 30 - 130 |            | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:30 | 1        |
| 13C2-PFTeDA       | IS   | 51.3       | 20 - 150 |            | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:30 | 1        |

DL - Detection Limit

LOD - Limit of Detection

The results are reported in dry weight.

LOQ - Limit of quantitation

The sample size is reported in wet weight.

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

| Sample ID: OPR    |                          |                  |           |                 |          |             |           |                 |           |                 | VAL - PFAS |  |
|-------------------|--------------------------|------------------|-----------|-----------------|----------|-------------|-----------|-----------------|-----------|-----------------|------------|--|
| Client Data       |                          |                  |           | Laboratory Data |          |             |           |                 |           |                 |            |  |
| Name:             | Merit Laboratories, Inc. | Matrix:          | Solid     | Lab Sample:     |          | B9D0148-BS1 | Column:   | BEH C18         |           |                 |            |  |
| Analyte           | CAS Number               | Amt Found (ng/g) | Spike Amt | % Rec           | Limits   | Qualifiers  | Batch     | Extracted       | Samp Size | Analyzed        | Dilution   |  |
| PFBA              | 375-22-4                 | 10.9             | 10.0      | 109             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFPeA             | 2706-90-3                | 10.8             | 10.0      | 108             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFBS              | 375-73-5                 | 10.1             | 10.0      | 101             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| 4:2 FTS           | 757124-72-4              | 10.2             | 10.0      | 102             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFHxA             | 307-24-4                 | 11.1             | 10.0      | 111             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFPeS             | 2706-91-4                | 11.4             | 10.0      | 114             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFHpA             | 375-85-9                 | 10.2             | 10.0      | 102             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFHxS             | 355-46-4                 | 10.3             | 10.0      | 103             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| 6:2 FTS           | 27619-97-2               | 9.56             | 10.0      | 95.6            | 60 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFOA              | 335-67-1                 | 10.6             | 10.0      | 106             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFHps             | 375-92-8                 | 10.2             | 10.0      | 102             | 60 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFNA              | 375-95-1                 | 10.0             | 10.0      | 100             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFOSA             | 754-91-6                 | 10.4             | 10.0      | 104             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFOS              | 1763-23-1                | 10.1             | 10.0      | 101             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFDA              | 335-76-2                 | 10.1             | 10.0      | 101             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| 8:2 FTS           | 39108-34-4               | 11.2             | 10.0      | 112             | 60 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFNS              | 68259-12-1               | 9.09             | 10.0      | 90.9            | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| MeFOSAA           | 2355-31-9                | 10.2             | 10.0      | 102             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| EtFOSAA           | 2991-50-6                | 11.3             | 10.0      | 113             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFUnA             | 2058-94-8                | 10.5             | 10.0      | 105             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFDS              | 335-77-3                 | 8.16             | 10.0      | 81.6            | 60 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFDoA             | 307-55-1                 | 11.6             | 10.0      | 116             | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFTrDA            | 72629-94-8               | 11.2             | 10.0      | 112             | 60 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| PFTeDA            | 376-06-7                 | 9.87             | 10.0      | 98.7            | 70 - 130 |             | B9D0148   | 25-Apr-19       | 1.00 g    | 30-Apr-19 01:19 | 1          |  |
| Labeled Standards | Type                     | % Rec            | Limits    | Qualifiers      | Batch    | Extracted   | Samp Size | Analyzed        | Dilution  |                 |            |  |
| 13C3-PFBA         | IS                       | 91.8             | 60 - 130  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C3-PFPeA        | IS                       | 90.2             | 60 - 150  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C3-PFBS         | IS                       | 89.4             | 60 - 150  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C2-4:2 FTS      | IS                       | 96.6             | 40 - 150  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C2-PFHxA        | IS                       | 91.6             | 70 - 130  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C4-PFHpA        | IS                       | 92.7             | 60 - 150  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C3-PFHxS        | IS                       | 90.2             | 60 - 130  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C2-6:2 FTS      | IS                       | 103              | 40 - 150  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C2-PFOA         | IS                       | 97.3             | 60 - 130  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |
| 13C5-PFNA         | IS                       | 85.5             | 50 - 130  |                 | B9D0148  | 25-Apr-19   | 1.00 g    | 30-Apr-19 01:19 | 1         |                 |            |  |

**Sample ID: OPR**
**VAL - PFAS**

| Client Data       |                          |         |       | Laboratory Data |             |         |           |           |                 |          |
|-------------------|--------------------------|---------|-------|-----------------|-------------|---------|-----------|-----------|-----------------|----------|
| Name:             | Merit Laboratories, Inc. | Matrix: | Solid | Lab Sample:     | B9D0148-BS1 | Column: | BEH C18   |           |                 |          |
| Labeled Standards |                          | Type    | % Rec | Limits          | Qualifiers  | Batch   | Extracted | Samp Size | Analyzed        | Dilution |
| 13C8-PFOSA        |                          | IS      | 45.7  | 20- 150         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| 13C8-PFOS         |                          | IS      | 96.4  | 60- 130         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| 13C2-PFDA         |                          | IS      | 79.7  | 60- 130         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| 13C2-8:2 FTS      |                          | IS      | 95.4  | 40- 150         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| d3-MeFOSAA        |                          | IS      | 66.0  | 50- 150         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| d5-EtFOSAA        |                          | IS      | 66.7  | 50- 150         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| 13C2-PFUnA        |                          | IS      | 69.6  | 60- 130         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| 13C2-PFDoA        |                          | IS      | 56.3  | 30- 130         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |
| 13C2-PFTeDA       |                          | IS      | 58.7  | 20- 150         |             | B9D0148 | 25-Apr-19 | 1.00 g    | 30-Apr-19 01:19 | 1        |

**Sample ID: SXDU11904091050MK**
**VAL - PFAS**

| Client Data       |  |              |          |                 |                 |            |         |                |                 | Laboratory Data |           |         |  |
|-------------------|--|--------------|----------|-----------------|-----------------|------------|---------|----------------|-----------------|-----------------|-----------|---------|--|
| Name:             | Merit Laboratories, Inc.                 |              |          | Matrix:         | Soil            |            |         | Lab Sample:    | 1900730-02      |                 | Column:   | BEH C18 |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation |              |          | Date Collected: | 09-Apr-19 10:50 |            |         | Date Received: | 11-Apr-19 09:35 |                 | % Solids: | 81.8    |  |
| Analyte           | CAS Number                               | Conc. (ng/g) | DL       | LOD             | LOQ             | Qualifiers | Batch   | Extracted      | Samp Size       | Analyzed        | Dilution  |         |  |
| PFBA              | 375-22-4                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFPeA             | 2706-90-3                                | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFBS              | 375-73-5                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 4:2 FTS           | 757124-72-4                              | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFHxA             | 307-24-4                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFPeS             | 2706-91-4                                | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFHpA             | 375-85-9                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFHxS             | 355-46-4                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 6:2 FTS           | 27619-97-2                               | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFOA              | 335-67-1                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFHpS             | 375-92-8                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFNA              | 375-95-1                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFOSA             | 754-91-6                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFOS              | 1763-23-1                                | 1.82         | 0.833    | 0.986           | 1.97            | J, Q       | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFDA              | 335-76-2                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 8:2 FTS           | 39108-34-4                               | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFNS              | 68259-12-1                               | ND           | 1.41     | 1.48            | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| MeFOSAA           | 2355-31-9                                | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| EtFOSAA           | 2991-50-6                                | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFUnA             | 2058-94-8                                | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFDS              | 335-77-3                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFDoA             | 307-55-1                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFTrDA            | 72629-94-8                               | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| PFTeDA            | 376-06-7                                 | ND           | 0.833    | 0.986           | 1.97            |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| Labeled Standards | Type                                     | % Recovery   | Limits   |                 |                 | Qualifiers | Batch   | Extracted      | Samp Size       | Analyzed        | Dilution  |         |  |
| 13C3-PFBA         | IS                                       | 93.1         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C3-PFPeA        | IS                                       | 89.0         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C3-PFBS         | IS                                       | 88.9         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C2-4:2 FTS      | IS                                       | 129          | 40 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C2-PFHxA        | IS                                       | 89.6         | 70 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C4-PFHxA        | IS                                       | 92.0         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C3-PFHxS        | IS                                       | 89.0         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C2-6:2 FTS      | IS                                       | 112          | 40 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C2-PFOA         | IS                                       | 80.6         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C5-PFNA         | IS                                       | 86.3         | 50 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C8-PFOSA        | IS                                       | 46.9         | 20 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C8-PFOS         | IS                                       | 88.0         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |
| 13C2-PFDA         | IS                                       | 66.6         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.24 g          | 30-Apr-19 05:02 | 1         |         |  |

**Sample ID: SXDU11904091050MK**
**VAL - PFAS**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: DELH-03N02W29-DT01

Matrix: Soil  
 Date Collected: 09-Apr-19 10:50

**Laboratory Data**

Lab Sample: 1900730-02  
 Date Received: 11-Apr-19 09:35  
 % Solids: 81.8

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |        |                 |   |
|--------------|----|------|----------|--|---------|-----------|--------|-----------------|---|
| 13C2-8:2 FTS | IS | 103  | 40 - 150 |  | B9D0148 | 25-Apr-19 | 1.24 g | 30-Apr-19 05:02 | 1 |
| d3-MeFOSAA   | IS | 82.6 | 50 - 150 |  | B9D0148 | 25-Apr-19 | 1.24 g | 30-Apr-19 05:02 | 1 |
| d5-EtFOSAA   | IS | 90.1 | 50 - 150 |  | B9D0148 | 25-Apr-19 | 1.24 g | 30-Apr-19 05:02 | 1 |
| 13C2-PFUnA   | IS | 84.1 | 60 - 130 |  | B9D0148 | 25-Apr-19 | 1.24 g | 30-Apr-19 05:02 | 1 |
| 13C2-PFDoA   | IS | 60.8 | 30 - 130 |  | B9D0148 | 25-Apr-19 | 1.24 g | 30-Apr-19 05:02 | 1 |
| 13C2-PFTeDA  | IS | 31.2 | 20 - 150 |  | B9D0148 | 25-Apr-19 | 1.24 g | 30-Apr-19 05:02 | 1 |

DL - Detection Limit

LOD - Limit of Detection

The results are reported in dry weight.

LOQ - Limit of quantitation

The sample size is reported in wet weight.

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: SXDU21904091155MK**
**VAL - PFAS**

| Client Data       |  |              |          |                 |                 |            |         |                |                 | Laboratory Data |           |         |  |
|-------------------|--|--------------|----------|-----------------|-----------------|------------|---------|----------------|-----------------|-----------------|-----------|---------|--|
| Name:             | Merit Laboratories, Inc.                 |              |          | Matrix:         | Soil            |            |         | Lab Sample:    | 1900730-04      |                 | Column:   | BEH C18 |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation |              |          | Date Collected: | 09-Apr-19 11:55 |            |         | Date Received: | 11-Apr-19 09:35 |                 | % Solids: | 82.0    |  |
| Analyte           | CAS Number                               | Conc. (ng/g) | DL       | LOD             | LOQ             | Qualifiers | Batch   | Extracted      | Samp Size       | Analyzed        | Dilution  |         |  |
| PFBA              | 375-22-4                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFPeA             | 2706-90-3                                | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFBS              | 375-73-5                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 4:2 FTS           | 757124-72-4                              | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFHxA             | 307-24-4                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFPeS             | 2706-91-4                                | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFHpA             | 375-85-9                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFHxS             | 355-46-4                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 6:2 FTS           | 27619-97-2                               | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFOA              | 335-67-1                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFHpS             | 375-92-8                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFNA              | 375-95-1                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFOSA             | 754-91-6                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFOS              | 1763-23-1                                | 8.98         | 0.838    | 0.991           | 1.98            | Q          | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFDA              | 335-76-2                                 | 2.98         | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 8:2 FTS           | 39108-34-4                               | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFNS              | 68259-12-1                               | ND           | 1.42     | 1.49            | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| MeFOSAA           | 2355-31-9                                | 1.57         | 0.838    | 0.991           | 1.98            | J, Q       | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| EtFOSAA           | 2991-50-6                                | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFUnA             | 2058-94-8                                | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFDS              | 335-77-3                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFDoA             | 307-55-1                                 | 1.29         | 0.838    | 0.991           | 1.98            | J          | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFTrDA            | 72629-94-8                               | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| PFTeDA            | 376-06-7                                 | ND           | 0.838    | 0.991           | 1.98            |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| Labeled Standards | Type                                     | % Recovery   | Limits   |                 |                 | Qualifiers | Batch   | Extracted      | Samp Size       | Analyzed        | Dilution  |         |  |
| 13C3-PFBA         | IS                                       | 90.5         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C3-PFPeA        | IS                                       | 91.2         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C3-PFBS         | IS                                       | 92.1         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C2-4:2 FTS      | IS                                       | 124          | 40 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C2-PFHxA        | IS                                       | 89.1         | 70 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C4-PFHpA        | IS                                       | 94.5         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C3-PFHxS        | IS                                       | 85.8         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C2-6:2 FTS      | IS                                       | 117          | 40 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C2-PFOA         | IS                                       | 95.6         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C5-PFNA         | IS                                       | 80.1         | 50 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C8-PFOSA        | IS                                       | 49.9         | 20 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C8-PFOS         | IS                                       | 81.6         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |
| 13C2-PFDA         | IS                                       | 72.6         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.23 g          | 30-Apr-19 05:13 | 1         |         |  |

**Sample ID: SXDU21904091155MK**
**VAL - PFAS**
**Client Data**

Name: Merit Laboratories, Inc.  
Project: Statewide WWTP Biosolids PFAS Evaluation  
Location: DELH-03N02W29-DT01

Matrix: Soil  
Date Collected: 09-Apr-19 11:55

**Laboratory Data**

Lab Sample: 1900730-04  
Date Received: 11-Apr-19 09:35  
% Solids: 82.0

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |   |         |           |        |                 |   |
|--------------|----|------|----------|---|---------|-----------|--------|-----------------|---|
| 13C2-8:2 FTS | IS | 98.4 | 40 - 150 |   | B9D0148 | 25-Apr-19 | 1.23 g | 30-Apr-19 05:13 | 1 |
| d3-MeFOSAA   | IS | 80.3 | 50 - 150 |   | B9D0148 | 25-Apr-19 | 1.23 g | 30-Apr-19 05:13 | 1 |
| d5-EtFOSAA   | IS | 82.7 | 50 - 150 |   | B9D0148 | 25-Apr-19 | 1.23 g | 30-Apr-19 05:13 | 1 |
| 13C2-PFUnA   | IS | 66.6 | 60 - 130 |   | B9D0148 | 25-Apr-19 | 1.23 g | 30-Apr-19 05:13 | 1 |
| 13C2-PFDoA   | IS | 44.2 | 30 - 130 |   | B9D0148 | 25-Apr-19 | 1.23 g | 30-Apr-19 05:13 | 1 |
| 13C2-PFTeDA  | IS | 19.6 | 20 - 150 | H | B9D0148 | 25-Apr-19 | 1.23 g | 30-Apr-19 05:13 | 1 |

DL - Detection Limit

LOD - Limit of Detection

The results are reported in dry weight.

LOQ - Limit of quantitation

The sample size is reported in wet weight.

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: SXDU21904091300MK**
**VAL - PFAS**

| Client Data       |  | Laboratory Data |  |                |            |                 |           |           |                 |                 |          |
|-------------------|--|-----------------|--|----------------|------------|-----------------|-----------|-----------|-----------------|-----------------|----------|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Soil   | Lab Sample:    |            | 1900730-06      | Column:   |           | BEH C18         |                 |          |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 09-Apr-19 13:00 <th data-cs="2" data-kind="parent">Date Received:</th> <th data-kind="ghost"></th> <td>11-Apr-19 09:35</td> <th data-cs="2" data-kind="parent">% Solids:</th> <th data-kind="ghost"></th> <td data-cs="2" data-kind="parent">81.6</td> <td data-kind="ghost"></td> | Date Received: |            | 11-Apr-19 09:35 | % Solids: |           | 81.6            |                 |          |
| Analyte           | CAS Number                               | Conc. (ng/g)    | DL   | LOD            | LOQ        | Qualifiers      | Batch     | Extracted | Samp Size       | Analyzed        | Dilution |
| PFBA              | 375-22-4                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFPeA             | 2706-90-3                                | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFBS              | 375-73-5                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| 4:2 FTS           | 757124-72-4                              | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFHxA             | 307-24-4                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFPeS             | 2706-91-4                                | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFHpA             | 375-85-9                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFHxS             | 355-46-4                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| 6:2 FTS           | 27619-97-2                               | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFOA              | 335-67-1                                 | 1.52            | 0.815  | 0.965          | 1.93       | J               | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFHpS             | 375-92-8                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFNA              | 375-95-1                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFOSA             | 754-91-6                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFOS              | 1763-23-1                                | 5.36            | 0.815  | 0.965          | 1.93       | Q               | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFDA              | 335-76-2                                 | 1.35            | 0.815  | 0.965          | 1.93       | J, Q            | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| 8:2 FTS           | 39108-34-4                               | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFNS              | 68259-12-1                               | ND              | 1.38   | 1.45           | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| MeFOSAA           | 2355-31-9                                | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| EtFOSAA           | 2991-50-6                                | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFUnA             | 2058-94-8                                | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFDS              | 335-77-3                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFDoA             | 307-55-1                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFTrDA            | 72629-94-8                               | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| PFTeDA            | 376-06-7                                 | ND              | 0.815  | 0.965          | 1.93       |                 | B9D0148   | 25-Apr-19 | 1.27 g          | 30-Apr-19 05:23 | 1        |
| Labeled Standards | Type                                     | % Recovery      | Limits   |                | Qualifiers | Batch           | Extracted | Samp Size | Analyzed        | Dilution        |          |
| 13C3-PFBA         | IS                                       | 94.7            | 60 - 130   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C3-PFPeA        | IS                                       | 89.8            | 60 - 150   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C3-PFBS         | IS                                       | 91.7            | 60 - 150   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C2-4:2 FTS      | IS                                       | 129             | 40 - 150   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C2-PFHxA        | IS                                       | 88.0            | 70 - 130   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C4-PFHpA        | IS                                       | 90.7            | 60 - 150   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C3-PFHxS        | IS                                       | 92.1            | 60 - 130   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C2-6:2 FTS      | IS                                       | 119             | 40 - 150   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C2-PFOA         | IS                                       | 86.8            | 60 - 130   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C5-PFNA         | IS                                       | 90.0            | 50 - 130   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C8-PFOSA        | IS                                       | 56.8            | 20 - 150   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C8-PFOS         | IS                                       | 89.0            | 60 - 130   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |
| 13C2-PFDA         | IS                                       | 77.9            | 60 - 130   |                |            | B9D0148         | 25-Apr-19 | 1.27 g    | 30-Apr-19 05:23 | 1               |          |

**Sample ID: SXDU21904091300MK**
**VAL - PFAS**
**Client Data**

Name: Merit Laboratories, Inc.  
Project: Statewide WWTP Biosolids PFAS Evaluation  
Location: DELH-03N02W29-DT02

Matrix: Soil  
Date Collected: 09-Apr-19 13:00

**Laboratory Data**

Lab Sample: 1900730-06  
Date Received: 11-Apr-19 09:35  
% Solids: 81.6

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |        |                 |   |
|--------------|----|------|----------|--|---------|-----------|--------|-----------------|---|
| 13C2-8:2 FTS | IS | 92.8 | 40 - 150 |  | B9D0148 | 25-Apr-19 | 1.27 g | 30-Apr-19 05:23 | 1 |
| d3-MeFOSAA   | IS | 98.6 | 50 - 150 |  | B9D0148 | 25-Apr-19 | 1.27 g | 30-Apr-19 05:23 | 1 |
| d5-EtFOSAA   | IS | 92.4 | 50 - 150 |  | B9D0148 | 25-Apr-19 | 1.27 g | 30-Apr-19 05:23 | 1 |
| 13C2-PFUnA   | IS | 84.9 | 60 - 130 |  | B9D0148 | 25-Apr-19 | 1.27 g | 30-Apr-19 05:23 | 1 |
| 13C2-PFDoA   | IS | 69.1 | 30 - 130 |  | B9D0148 | 25-Apr-19 | 1.27 g | 30-Apr-19 05:23 | 1 |
| 13C2-PFTeDA  | IS | 56.4 | 20 - 150 |  | B9D0148 | 25-Apr-19 | 1.27 g | 30-Apr-19 05:23 | 1 |

DL - Detection Limit

LOD - Limit of Detection

The results are reported in dry weight.

LOQ - Limit of quantitation

The sample size is reported in wet weight.

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: SXDU11904091350MK**
**VAL - PFAS**

| Client Data       |  |              |          |                 |                 |            |         |                |                 | Laboratory Data |           |         |  |
|-------------------|--|--------------|----------|-----------------|-----------------|------------|---------|----------------|-----------------|-----------------|-----------|---------|--|
| Name:             | Merit Laboratories, Inc.                 |              |          | Matrix:         | Soil            |            |         | Lab Sample:    | 1900730-07      |                 | Column:   | BEH C18 |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation |              |          | Date Collected: | 09-Apr-19 13:50 |            |         | Date Received: | 11-Apr-19 09:35 |                 | % Solids: | 71.9    |  |
| Analyte           | CAS Number                               | Conc. (ng/g) | DL       | LOD             | LOQ             | Qualifiers | Batch   | Extracted      | Samp Size       | Analyzed        | Dilution  |         |  |
| PFBA              | 375-22-4                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFPeA             | 2706-90-3                                | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFBS              | 375-73-5                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 4:2 FTS           | 757124-72-4                              | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFHxA             | 307-24-4                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFPeS             | 2706-91-4                                | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFHpA             | 375-85-9                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFHxS             | 355-46-4                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 6:2 FTS           | 27619-97-2                               | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFOA              | 335-67-1                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFHpS             | 375-92-8                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFNA              | 375-95-1                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFOSA             | 754-91-6                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFOS              | 1763-23-1                                | 2.84         | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFDA              | 335-76-2                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 8:2 FTS           | 39108-34-4                               | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFNS              | 68259-12-1                               | ND           | 1.40     | 1.47            | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| MeFOSAA           | 2355-31-9                                | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| EtFOSAA           | 2991-50-6                                | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFUnA             | 2058-94-8                                | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFDS              | 335-77-3                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFDoA             | 307-55-1                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFTrDA            | 72629-94-8                               | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| PFTeDA            | 376-06-7                                 | ND           | 0.828    | 0.979           | 1.96            |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| Labeled Standards | Type                                     | % Recovery   | Limits   |                 |                 | Qualifiers | Batch   | Extracted      | Samp Size       | Analyzed        | Dilution  |         |  |
| 13C3-PFBA         | IS                                       | 90.3         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C3-PFPeA        | IS                                       | 86.8         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C3-PFBS         | IS                                       | 83.4         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C2-4:2 FTS      | IS                                       | 105          | 40 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C2-PFHxA        | IS                                       | 82.1         | 70 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C4-PFHpA        | IS                                       | 87.0         | 60 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C3-PFHxS        | IS                                       | 71.2         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C2-6:2 FTS      | IS                                       | 116          | 40 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C2-PFOA         | IS                                       | 79.9         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C5-PFNA         | IS                                       | 73.3         | 50 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C8-PFOSA        | IS                                       | 48.7         | 20 - 150 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C8-PFOS         | IS                                       | 78.0         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |
| 13C2-PFDA         | IS                                       | 68.3         | 60 - 130 |                 |                 |            | B9D0148 | 25-Apr-19      | 1.42 g          | 30-Apr-19 05:34 | 1         |         |  |

**Sample ID:** SXDU11904091350MK

**VAL - PFAS**
**Client Data**

Name: Merit Laboratories, Inc.  
Project: Statewide WWTP Biosolids PFAS Evaluation  
Location: DELH-03N02W29-DT02

Matrix: Soil  
Date Collected: 09-Apr-19 13:50

**Laboratory Data**

Lab Sample: 1900730-07  
Date Received: 11-Apr-19 09:35  
% Solids: 71.9

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |        |                 |   |
|--------------|----|------|----------|--|---------|-----------|--------|-----------------|---|
| 13C2-8:2 FTS | IS | 104  | 40 - 150 |  | B9D0148 | 25-Apr-19 | 1.42 g | 30-Apr-19 05:34 | 1 |
| d3-MeFOSAA   | IS | 94.5 | 50 - 150 |  | B9D0148 | 25-Apr-19 | 1.42 g | 30-Apr-19 05:34 | 1 |
| d5-EtFOSAA   | IS | 88.7 | 50 - 150 |  | B9D0148 | 25-Apr-19 | 1.42 g | 30-Apr-19 05:34 | 1 |
| 13C2-PFUnA   | IS | 71.5 | 60 - 130 |  | B9D0148 | 25-Apr-19 | 1.42 g | 30-Apr-19 05:34 | 1 |
| 13C2-PFDoA   | IS | 52.1 | 30 - 130 |  | B9D0148 | 25-Apr-19 | 1.42 g | 30-Apr-19 05:34 | 1 |
| 13C2-PFTeDA  | IS | 24.6 | 20 - 150 |  | B9D0148 | 25-Apr-19 | 1.42 g | 30-Apr-19 05:34 | 1 |

DL - Detection Limit

LOD - Limit of Detection

The results are reported in dry weight.

LOQ - Limit of quantitation

The sample size is reported in wet weight.

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

## DATA QUALIFIERS & ABBREVIATIONS

|       |   |
|-------|---|
| B     | This compound was also detected in the method blank                                     |
| Conc. | Concentration   |
| D     | Dilution  |
| DL    | Detection limit   |
| E     | The associated compound concentration exceeded the calibration range of the instrument  |
| H     | Recovery and/or RPD was outside laboratory acceptance limits                            |
| I     | Chemical Interference   |
| J     | The amount detected is below the Reporting Limit/LOQ                                    |
| LOD   | Limits of Detection   |
| LOQ   | Limits of Quantitation  |
| M     | Estimated Maximum Possible Concentration (CA Region 2 projects only)                    |
| NA    | Not applicable  |
| ND    | Not Detected  |
| P     | The reported concentration may include contribution from chlorinated diphenyl ether(s). |
| Q     | The ion transition ratio is outside of the acceptance criteria.                         |
| TEQ   | Toxic Equivalency   |
| U     | Not Detected (specific projects only)   |
| *     | See Cover Letter  |

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

## Vista Analytical Laboratory Certifications

| Accrediting Authority                               | Certificate Number |
|---|--------------------|
| Alaska Department of Environmental Conservation     | 17-013             |
| Arkansas Department of Environmental Quality        | 19-013-0           |
| California Department of Health – ELAP              | 2892               |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005     | 3091.01            |
| Florida Department of Health                        | E87777             |
| Hawaii Department of Health                         | N/A                |
| Louisiana Department of Environmental Quality       | 01977              |
| Maine Department of Health                          | 2018017            |
| Michigan Department of Environmental Quality        | 9932               |
| Minnesota Department of Health                      | 1521520            |
| New Hampshire Environmental Accreditation Program   | 207718             |
| New Jersey Department of Environmental Protection   | CA003              |
| New York Department of Health                       | 11411              |
| Oregon Laboratory Accreditation Program             | 4042-010           |
| Pennsylvania Department of Environmental Protection | 015                |
| Texas Commission on Environmental Quality           | T104704189-19-10   |
| Virginia Department of General Services             | 9618               |
| Washington Department of Ecology                    | C584-19            |
| Wisconsin Department of Natural Resources           | 998036160          |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

| MATRIX: Air  |           |
|--|-----------|
| Description of Test  | Method    |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23    |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue   |                |
|---|----------------|
| Description of Test   | Method         |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS              | EPA 1613B      |
| Brominated Diphenyl Ethers by HRGC/HRMS   | EPA 1614A      |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS              | EPA 1668A/C    |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS                     | EPA 1699       |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS                            | EPA 537        |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS              | EPA 8280A/B    |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water   |                |
|--|----------------|
| Description of Test  | Method         |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS      | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS            | EPA 522        |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537        |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water   |                |
|---|----------------|
| Description of Test   | Method         |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS              | EPA 1613B      |
| Brominated Diphenyl Ethers by HRGC/HRMS   | EPA 1614A      |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS              | EPA 1668A/C    |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS                     | EPA 1699       |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS                            | EPA 537        |
| Dioxin by GC/HRMS   | EPA 613        |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS              | EPA 8280A/B    |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids  |                |
|---|----------------|
| Description of Test   | Method         |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS                       | EPA 1613       |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS              | EPA 1613B      |
| Brominated Diphenyl Ethers by HRGC/HRMS   | EPA 1614A      |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS              | EPA 1668A/C    |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS                     | EPA 1699       |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS                            | EPA 537        |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS              | EPA 8280A/B    |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |



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## CHAIN OF CUSTODY

|  |         |
|--|---------|
| For Laboratory Use Only  |         |
| Work Order #:  | 1900730 |
| Temp:  | 2.3 °C  |
| Storage ID:  | WR-2    |
| Storage Secured: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |         |

Project ID: Statewide WWTP Biosolids PFAS Evaluation PO#: 60588767.01 Sampler: Michal Kosciarz + Rachel Lopez  
(name)

|   |   |
|---|---|
| TAT   | Standard: <input checked="" type="checkbox"/> 21 days |
| (check one): Rush (surcharge may apply)   |   |
| <input type="checkbox"/> 14 days <input type="checkbox"/> 7 days Specify: _____ |   |

|                                      |                 |                                  |                 |             |                     |                      |
|--------------------------------------|-----------------|----------------------------------|-----------------|-------------|---------------------|----------------------|
| Invoice to: Name<br>Stephanie Kammer | Company<br>MDEQ | Address<br>525 W. Allegan Street | City<br>Lansing | State<br>MI | Ph#<br>517-897-1597 | Fax#<br>517-241-3571 |
|--------------------------------------|-----------------|----------------------------------|-----------------|-------------|---------------------|----------------------|

|   |                   |              |  |                  |              |
|---|-------------------|--------------|--|------------------|--------------|
| Relinquished by (printed name and signature)<br>Michal Kosciarz | Date<br>4/10/2019 | Time<br>1830 | Received by (printed name and signature)<br>Marissa Sparks | Date<br>04/11/19 | Time<br>0935 |
|---|-------------------|--------------|--|------------------|--------------|

|  |      |      |  |      |      |
|--|------|------|--|------|------|
| Relinquished by (printed name and signature) | Date | Time | Received by (printed name and signature) | Date | Time |
|--|------|------|--|------|------|

| Sample ID         | Date   | Time | Location/Sample Description | Add Analysis(es) Requested |      |        |            |                       |            |                       |            | Comments                |      |      |                   |              |                  |
|-------------------|--------|------|-----------------------------|----------------------------|------|--------|------------|-----------------------|------------|-----------------------|------------|-------------------------|------|------|-------------------|--------------|------------------|
|                   |        |      |                             | Quantity                   | Type | Matrix | List or 21 | List or 21 w/ Isomers | List or 24 | List or 24 w/ Isomers | List or 28 | Other Please List Below | PFOA | PFOS | UCMR3 PFAS List 6 | PFAS List 14 | USEPA Method 537 |
| SW011904091015RL  | 4/9/19 | 1015 | DELH-03N02W29-DT01          | 2                          | P    | AQ     |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
| SXDU11904091050MK | 4/9/19 | 1050 | DELH-03N02W29-DT01          | 1                          | PJ   | SO     |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
| SW031904091125RL  | 4/9/19 | 1125 | DELH-03N02W29-DT01          | 2                          | P    | AQ     |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
| SXDU21904091155MK | 4/9/19 | 1155 | DELH-03N02W29-DT01          | 1                          | PJ   | SO     |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
| SW041904091255RL  | 4/9/19 | 1255 | DELH-03N02W29-DT01          | 2                          | P    | AQ     |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
| SXDU21904091300MK | 4/9/19 | 1300 | DELH-03N02W29-DT02          | 1                          | PJ   | SO     |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
| SXDU11904091350MK | 4/9/19 | 1350 | DELH-03N02W29-DT02          | 1                          | PJ   | SO     |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
|                   |        |      |                             |                            |      |        |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
|                   |        |      |                             |                            |      |        |            | X                     |            |                       |            |                         |      |      |                   |              |                  |
|                   |        |      |                             |                            |      |        |            | X                     |            |                       |            |                         |      |      |                   |              |                  |

Special Instructions/Comments: Send Results and Acknowledgements to the list provided

SEND  
DOCUMENTATION  
AND RESULTS TO:

Name: Stephanie Kammer  
Company: MDEQ  
Address: 525 W. Allegan Street, Constitution Hall, 1st South West  
City: Lansing State: MI Zip: 30242  
Phone: 517-897-1597 Fax: 517-241-3571  
Email: dorin.bogdan@aecom.com

Container Types: P = HDPE, PJ = HDPE Jar

Bottle Preservation Type: T = Thiosulfate,

O = Other:

TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,  
SL = Sludge, BS = Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

## Sample Log-In Checklist

Vista Work Order #:

1900730

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TAT std

|                  |                            |                   |                  |         |   |                |       |
|------------------|----------------------------|-------------------|------------------|---------|---|----------------|-------|
| Samples Arrival: | Date/Time<br>04/11/19 0935 |                   | Initials:<br>MWS |         | Location: WR-2<br>Shelf/Rack: N/A         |                |       |
| Logged In:       | Date/Time<br>04/12/19 1451 |                   | Initials:<br>KE  |         | Location: WR-2<br>Shelf/Rack: A48 1A3/2E7 |                |       |
| Delivered By:    | FedEx                      | UPS               | On Trac          | GSO     | DHL                                       | Hand Delivered | Other |
| Preservation:    | Ice                        | Blue Ice          |                  | Dry Ice |   | None           |       |
| Temp °C: 2.4     | (uncorrected)              | Probe used: Y / N |                  |         | Thermometer ID: IR-4                      |                |       |
| Temp °C: 2.3     | (corrected)                |                   |                  |         |   |                |       |

|  | YES  | NO     | NA     |        |         |    |
|--|--|--------|--------|--------|---------|----|
| Adequate Sample Volume Received?                                   | ✓  |        |        |        |         |    |
| Holding Time Acceptable?   | ✓  |        |        |        |         |    |
| Shipping Container(s) Intact?                                      | ✓  |        |        |        |         |    |
| Shipping Custody Seals Intact?                                     |  | ✓      |        |        |         |    |
| Shipping Documentation Present?                                    | ✓  |        |        |        |         |    |
| Airbill 2 of 2 Trk # 7865 7749 8547                                | J  |        |        |        |         |    |
| Sample Container Intact?   | ✓  |        |        |        |         |    |
| Sample Custody Seals Intact?                                       |  | ✓      |        |        |         |    |
| Chain of Custody / Sample Documentation Present?                   | J  |        |        |        |         |    |
| COC Anomaly/Sample Acceptance Form completed?                      |  | ✓      | ✓      |        |         |    |
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? |  |        | ✓      |        |         |    |
| Preservation Documented:   | Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub><br>Other | Trizma | None   | Yes    | No      | NA |
| Shipping Container   | Vista  | Client | Retain | Return | Dispose |    |

Comments:



January 30, 2020

**Vista Work Order No. 2000118**

Ms. Maya Murshak  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on January 21, 2020 under your Project Name 'Statewide WWTP Biosolids PFAS Evaluation'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

**Vista Work Order No. 2000118B****Case Narrative****Sample Condition on Receipt:**

Eighteen aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. As directed, the results for nine samples have been issued in a separate report.

**Analytical Notes:****PFAS Isotope Dilution Method**

Samples "GW2001141450RAP" and "GW2001161140RAP" contained particulate and were centrifuged prior to extraction:

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537). The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

**Holding Times**

The samples were extracted and analyzed within the method hold times.

**Quality Control**

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the acceptance criteria are flagged with an "H" qualifier.

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# Sample Inventory Report

| Vista Sample ID | Client Sample ID   | Sampled         | Received        | Components/Containers |
|-----------------|--------------------|-----------------|-----------------|-----------------------|
| 2000118-01      | GW2001131025RAP    | 13-Jan-20 10:25 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-02      | GW2001131155RAP    | 13-Jan-20 11:55 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-03      | GW2001131320RAP    | 13-Jan-20 13:20 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-04      | GW2001131320RAP-FD | 13-Jan-20 13:20 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-05      | GW2001131435RAP    | 13-Jan-20 14:35 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-06      | GW2001131535RAP    | 13-Jan-20 15:35 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-07      | GW2001131620RAP    | 13-Jan-20 16:20 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-08      | GW2001141055RAP    | 14-Jan-20 10:55 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-09      | GW2001141210RAP    | 14-Jan-20 12:10 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-10      | GW2001141450RAP    | 14-Jan-20 14:50 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-11      | GW2001141525RAP    | 14-Jan-20 15:25 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-12      | GW2001161030RAP    | 16-Jan-20 10:30 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-13      | GW2001161140RAP    | 16-Jan-20 11:40 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-14      | GW2001161305RAP    | 16-Jan-20 13:05 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-15      | GW2001161400RAP    | 16-Jan-20 14:00 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-16      | GW2001161500RAP    | 16-Jan-20 15:00 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-17      | GW2001161500RAP-FD | 16-Jan-20 15:00 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
| 2000118-18      | GW2001161615RAP    | 16-Jan-20 16:15 | 21-Jan-20 09:42 | HDPE Bottle, 250 mL   |
|                 |                    |                 |                 | HDPE Bottle, 250 mL   |

## **ANALYTICAL RESULTS**

| Sample ID: Method Blank |                          |              |          |                 |            |            |           |             |                 | PFAS Isotope Dilution Method |          |         |  |
|-------------------------|--------------------------|--------------|----------|-----------------|------------|------------|-----------|-------------|-----------------|------------------------------|----------|---------|--|
| Client Data             |                          |              |          | Laboratory Data |            |            |           |             |                 |                              |          |         |  |
| Name:                   | Merit Laboratories, Inc. |              |          | Matrix:         | Aqueous    |            |           | Lab Sample: | B0A0148-BLK1    |                              | Column:  | BEH C18 |  |
| Analyte                 | CAS Number               | Conc. (ng/L) | DL       | LOD             | LOQ        | Qualifiers | Batch     | Extracted   | Samp Size       | Analyzed                     | Dilution |         |  |
| PFBA                    | 375-22-4                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFPeA                   | 2706-90-3                | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFBS                    | 375-73-5                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| 4:2 FTS                 | 757124-72-4              | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFHxA                   | 307-24-4                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFPeS                   | 2706-91-4                | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFHpA                   | 375-85-9                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFHxS                   | 355-46-4                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| 6:2 FTS                 | 27619-97-2               | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFOA                    | 335-67-1                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFHpS                   | 375-92-8                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFNA                    | 375-95-1                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFOSA                   | 754-91-6                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFOS                    | 1763-23-1                | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFDA                    | 335-76-2                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| 8:2 FTS                 | 39108-34-4               | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFNS                    | 68259-12-1               | ND           | 1.94     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| MeFOSAA                 | 2355-31-9                | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| EtFOSAA                 | 2991-50-6                | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFUnA                   | 2058-94-8                | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFDS                    | 335-77-3                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFDoA                   | 307-55-1                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFTrDA                  | 72629-94-8               | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| PFTeDA                  | 376-06-7                 | ND           | 1.37     | 2.00            | 4.00       |            | B0A0148   | 23-Jan-20   | 0.250 L         | 27-Jan-20 23:27              | 1        |         |  |
| Labeled Standards       | Type                     | % Recovery   | Limits   |                 | Qualifiers | Batch      | Extracted | Samp Size   | Analyzed        | Dilution                     |          |         |  |
| 13C3-PFBA               | IS                       | 89.7         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C3-PFPeA              | IS                       | 86.0         | 60 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C3-PFBS               | IS                       | 111          | 60 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C2-4:2 FTS            | IS                       | 95.1         | 20 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C2-PFHxA              | IS                       | 90.8         | 70 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C4-PFHpA              | IS                       | 94.6         | 60 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C3-PFHxS              | IS                       | 108          | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C2-6:2 FTS            | IS                       | 91.7         | 40 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C5-PFNA               | IS                       | 86.5         | 50 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C8-PFOSA              | IS                       | 20.4         | 20 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C2-PFOA               | IS                       | 86.5         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C8-PFOS               | IS                       | 85.0         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |
| 13C2-PFDA               | IS                       | 89.5         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.250 L     | 27-Jan-20 23:27 | 1                            |          |         |  |

| Sample ID: Method Blank |  |            |          |                 |         |           |                          | PFAS Isotope Dilution Method |          |  |                 |
|-------------------------|--|------------|----------|-----------------|---------|-----------|--------------------------|------------------------------|----------|--|-----------------|
| Client Data             |  |            |          | Laboratory Data |         |           |                          |                              |          |  |                 |
| Name:                   | Merit Laboratories, Inc.                 |            |          | Matrix:         | Aqueous |           | Lab Sample: B0A0148-BLK1 |                              |          |  | Column: BEH C18 |
| Project:                | Statewide WWTP Biosolids PFAS Evaluation |            |          |                 |         |           |                          |                              |          |  |                 |
| Labeled Standards       | Type                                     | % Recovery | Limits   | Qualifiers      | Batch   | Extracted | Samp Size                | Analyzed                     | Dilution |  |                 |
| 13C2-8:2 FTS            | IS                                       | 83.8       | 40 - 150 |                 | B0A0148 | 23-Jan-20 | 0.250 L                  | 27-Jan-20 23:27              | 1        |  |                 |
| d3-MeFOSAA              | IS                                       | 75.9       | 50 - 150 |                 | B0A0148 | 23-Jan-20 | 0.250 L                  | 27-Jan-20 23:27              | 1        |  |                 |
| 13C2-PFUnA              | IS                                       | 71.4       | 60 - 130 |                 | B0A0148 | 23-Jan-20 | 0.250 L                  | 27-Jan-20 23:27              | 1        |  |                 |
| d5-EtFOSAA              | IS                                       | 73.8       | 50 - 150 |                 | B0A0148 | 23-Jan-20 | 0.250 L                  | 27-Jan-20 23:27              | 1        |  |                 |
| 13C2-PFDoA              | IS                                       | 77.0       | 30 - 130 |                 | B0A0148 | 23-Jan-20 | 0.250 L                  | 27-Jan-20 23:27              | 1        |  |                 |
| 13C2-PFTeDA             | IS                                       | 76.6       | 20 - 150 |                 | B0A0148 | 23-Jan-20 | 0.250 L                  | 27-Jan-20 23:27              | 1        |  |                 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

| Sample ID: OPR    |                          |                  |           |                 |            |            |             |           |                 |                 | PFAS Isotope Dilution Method |  |  |  |
|-------------------|--------------------------|------------------|-----------|-----------------|------------|------------|-------------|-----------|-----------------|-----------------|------------------------------|--|--|--|
| Client Data       |                          |                  |           | Laboratory Data |            |            |             |           |                 |                 |                              |  |  |  |
| Name:             | Merit Laboratories, Inc. | Matrix:          | Aqueous   | Lab Sample:     |            |            | B0A0148-BS1 | Column:   | BEH C18         |                 |                              |  |  |  |
| Analyte           | CAS Number               | Amt Found (ng/L) | Spike Amt | % Rec           | Limits     | Qualifiers | Batch       | Extracted | Samp Size       | Analyzed        | Dilution                     |  |  |  |
| PFBA              | 375-22-4                 | 43.2             | 40.0      | 108             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFPeA             | 2706-90-3                | 44.6             | 40.0      | 112             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFBS              | 375-73-5                 | 44.6             | 40.0      | 111             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| 4:2 FTS           | 757124-72-4              | 44.6             | 40.0      | 111             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFHxA             | 307-24-4                 | 45.6             | 40.0      | 114             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFPeS             | 2706-91-4                | 45.9             | 40.0      | 115             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFHpA             | 375-85-9                 | 43.5             | 40.0      | 109             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFHxS             | 355-46-4                 | 45.4             | 40.0      | 113             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| 6:2 FTS           | 27619-97-2               | 38.2             | 40.0      | 95.5            | 60 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFOA              | 335-67-1                 | 43.4             | 40.0      | 108             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFHps             | 375-92-8                 | 44.9             | 40.0      | 112             | 60 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFNA              | 375-95-1                 | 45.1             | 40.0      | 113             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFOSA             | 754-91-6                 | 43.1             | 40.0      | 108             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFOS              | 1763-23-1                | 38.7             | 40.0      | 96.6            | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFDA              | 335-76-2                 | 42.3             | 40.0      | 106             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| 8:2 FTS           | 39108-34-4               | 44.4             | 40.0      | 111             | 60 - 130   | Q          | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFNS              | 68259-12-1               | 36.3             | 40.0      | 90.7            | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| MeFOSAA           | 2355-31-9                | 48.9             | 40.0      | 122             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| EtFOSAA           | 2991-50-6                | 45.0             | 40.0      | 113             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFUnA             | 2058-94-8                | 41.3             | 40.0      | 103             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFDS              | 335-77-3                 | 36.7             | 40.0      | 91.8            | 60 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFDoA             | 307-55-1                 | 44.7             | 40.0      | 112             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFTrDA            | 72629-94-8               | 47.6             | 40.0      | 119             | 60 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| PFTeDA            | 376-06-7                 | 45.0             | 40.0      | 112             | 70 - 130   |            | B0A0148     | 23-Jan-20 | 0.250 L         | 28-Jan-20 18:07 | 1                            |  |  |  |
| Labeled Standards |                          | Type             | % Rec     | Limits          | Qualifiers | Batch      | Extracted   | Samp Size | Analyzed        | Dilution        |                              |  |  |  |
| 13C3-PFBA         |                          | IS               | 96.3      | 60 - 130        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C3-PFPeA        |                          | IS               | 90.4      | 60 - 150        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C3-PFBS         |                          | IS               | 93.6      | 60 - 150        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C2-4:2 FTS      |                          | IS               | 83.8      | 20 - 150        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C2-PFHxA        |                          | IS               | 89.6      | 70 - 130        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C4-PFHpA        |                          | IS               | 95.0      | 60 - 150        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C3-PFHxS        |                          | IS               | 93.5      | 60 - 130        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C2-6:2 FTS      |                          | IS               | 88.0      | 40 - 150        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C5-PFNA         |                          | IS               | 92.2      | 50 - 130        |            | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |
| 13C8-PFOSA        |                          | IS               | 18.6      | 20 - 150        | H          | B0A0148    | 23-Jan-20   | 0.250 L   | 28-Jan-20 18:07 | 1               |                              |  |  |  |

| Sample ID: OPR    |  |         |         |                 |             |           |           | PFAS Isotope Dilution Method |          |  |
|-------------------|--|---------|---------|-----------------|-------------|-----------|-----------|------------------------------|----------|--|
| Client Data       |  |         |         | Laboratory Data |             |           |           |                              |          |  |
| Name:             | Merit Laboratories, Inc.                 | Matrix: | Aqueous | Lab Sample:     | B0A0148-BS1 | Column:   | BEH C18   |                              |          |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation |         |         |                 |             |           |           |                              |          |  |
| Labeled Standards | Type                                     | % Rec   | Limits  | Qualifiers      | Batch       | Extracted | Samp Size | Analyzed                     | Dilution |  |
| 13C2-PFOA         | IS                                       | 92.3    | 60- 130 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| 13C8-PFOS         | IS                                       | 94.3    | 60- 130 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| 13C2-PFDA         | IS                                       | 91.3    | 60- 130 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| 13C2-8:2 FTS      | IS                                       | 84.9    | 40- 150 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| d3-MeFOSAA        | IS                                       | 63.5    | 50- 150 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| 13C2-PFUnA        | IS                                       | 78.2    | 60- 130 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| d5-EtFOSAA        | IS                                       | 67.4    | 50- 150 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| 13C2-PFDoA        | IS                                       | 68.8    | 30- 130 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |
| 13C2-PFTeDA       | IS                                       | 76.6    | 20- 150 |                 | B0A0148     | 23-Jan-20 | 0.250 L   | 28-Jan-20 18:07              | 1        |  |

| Sample ID: GW2001141450RAP |                          |              |          |                 |            |            |           |                 |                 | PFAS Isotope Dilution Method |                 |  |  |
|----------------------------|--------------------------|--------------|----------|-----------------|------------|------------|-----------|-----------------|-----------------|------------------------------|-----------------|--|--|
| Client Data                |                          |              |          | Laboratory Data |            |            |           |                 |                 |                              |                 |  |  |
| Name:                      | Merit Laboratories, Inc. | Matrix:      | Aqueous  | Lab Sample:     | 2000118-10 | Column:    | BEH C18   | Date Collected: | 14-Jan-20 14:50 | Date Received:               | 21-Jan-20 09:42 |  |  |
| Analyte                    | CAS Number               | Conc. (ng/L) | DL       | LOD             | LOQ        | Qualifiers | Batch     | Extracted       | Samp Size       | Analyzed                     | Dilution        |  |  |
| PFBA                       | 375-22-4                 | 35.6         | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFPeA                      | 2706-90-3                | 50.2         | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFBS                       | 375-73-5                 | 54.6         | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| 4:2 FTS                    | 757124-72-4              | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFHxA                      | 307-24-4                 | 45.5         | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFPeS                      | 2706-91-4                | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFHpA                      | 375-85-9                 | 24.0         | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFHxS                      | 355-46-4                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| 6:2 FTS                    | 27619-97-2               | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFOA                       | 335-67-1                 | 9.86         | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFHpS                      | 375-92-8                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFNA                       | 375-95-1                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFOSA                      | 754-91-6                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFOS                       | 1763-23-1                | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFDA                       | 335-76-2                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| 8:2 FTS                    | 39108-34-4               | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFNS                       | 68259-12-1               | ND           | 1.97     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| MeFOSAA                    | 2355-31-9                | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| EtFOSAA                    | 2991-50-6                | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFUnA                      | 2058-94-8                | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFDS                       | 335-77-3                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFDoA                      | 307-55-1                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFTrDA                     | 72629-94-8               | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| PFTeDA                     | 376-06-7                 | ND           | 1.40     | 2.04            | 4.08       |            | B0A0148   | 23-Jan-20       | 0.245 L         | 28-Jan-20 01:43              | 1               |  |  |
| Labeled Standards          | Type                     | % Recovery   | Limits   |                 | Qualifiers | Batch      | Extracted | Samp Size       | Analyzed        | Dilution                     |                 |  |  |
| 13C3-PFBA                  | IS                       | 86.0         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C3-PFPeA                 | IS                       | 99.6         | 60 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C3-PFBS                  | IS                       | 100          | 60 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C2-4:2 FTS               | IS                       | 101          | 20 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C2-PFHxA                 | IS                       | 95.5         | 70 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C4-PFHxA                 | IS                       | 98.8         | 60 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C3-PFHxS                 | IS                       | 98.9         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C2-6:2 FTS               | IS                       | 92.8         | 40 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C5-PFNA                  | IS                       | 91.4         | 50 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C8-PFOSA                 | IS                       | 72.0         | 20 - 150 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C2-PFOA                  | IS                       | 86.2         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C8-PFOS                  | IS                       | 86.8         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |
| 13C2-PFDA                  | IS                       | 88.8         | 60 - 130 |                 |            | B0A0148    | 23-Jan-20 | 0.245 L         | 28-Jan-20 01:43 | 1                            |                 |  |  |

**Sample ID: GW2001141450RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA03-MW1S

Matrix: Aqueous  
 Date Collected: 14-Jan-20 14:50

**Laboratory Data**

Lab Sample: 2000118-10  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 87.1 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.245 L | 28-Jan-20 01:43 | 1 |
| d3-MeFOSAA   | IS | 103  | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.245 L | 28-Jan-20 01:43 | 1 |
| 13C2-PFUnA   | IS | 91.4 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.245 L | 28-Jan-20 01:43 | 1 |
| d5-EtFOSAA   | IS | 104  | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.245 L | 28-Jan-20 01:43 | 1 |
| 13C2-PFDoA   | IS | 77.3 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.245 L | 28-Jan-20 01:43 | 1 |
| 13C2-PFTeDA  | IS | 90.5 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.245 L | 28-Jan-20 01:43 | 1 |

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: GW2001141525RAP**
**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |                |   |            |           |           |                 |                 |          |  |
|-------------------|--|-----------------|-----------------|----------------|---|------------|-----------|-----------|-----------------|-----------------|----------|--|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample:    | 2000118-11  | Column:    | BEH C18   |           |                 |                 |          |  |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 14-Jan-20 15:25 | Date Received: | 21-Jan-20 09:42 <th data-cs="5" data-kind="parent"></th> <th data-kind="ghost"></th> <th data-kind="ghost"></th> <th data-kind="ghost"></th> <th data-kind="ghost"></th> <th data-cs="2" data-kind="parent"></th> <th data-kind="ghost"></th> |            |           |           |                 |                 |          |  |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD            | LOQ   | Qualifiers | Batch     | Extracted | Samp Size       | Analyzed        | Dilution |  |
| PFBA              | 375-22-4                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFPeA             | 2706-90-3                                | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFBS              | 375-73-5                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFHxA             | 307-24-4                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFPeS             | 2706-91-4                                | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFHpA             | 375-85-9                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFHxS             | 355-46-4                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFOA              | 335-67-1                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFHpS             | 375-92-8                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFNA              | 375-95-1                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFOSA             | 754-91-6                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFOS              | 1763-23-1                                | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFDA              | 335-76-2                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFNS              | 68259-12-1                               | ND              | 1.96            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| MeFOSAA           | 2355-31-9                                | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| EtFOSAA           | 2991-50-6                                | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFUnA             | 2058-94-8                                | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFDS              | 335-77-3                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFDoA             | 307-55-1                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFTrDA            | 72629-94-8                               | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| PFTeDA            | 376-06-7                                 | ND              | 1.38            | 2.02           | 4.04  |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 01:54 | 1        |  |
| Labeled Standards | Type                                     | % Recovery      | Limits          |                | Qualifiers  | Batch      | Extracted | Samp Size | Analyzed        | Dilution        |          |  |
| 13C3-PFBA         | IS                                       | 86.3            | 60 - 130        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C3-PFPeA        | IS                                       | 88.2            | 60 - 150        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C3-PFBS         | IS                                       | 92.6            | 60 - 150        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C2-4:2 FTS      | IS                                       | 88.5            | 20 - 150        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C2-PFHxA        | IS                                       | 88.1            | 70 - 130        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C4-PFHpA        | IS                                       | 86.4            | 60 - 150        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C3-PFHxS        | IS                                       | 90.4            | 60 - 130        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C2-6:2 FTS      | IS                                       | 95.8            | 40 - 150        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C5-PFNA         | IS                                       | 89.0            | 50 - 130        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C8-PFOSA        | IS                                       | 65.9            | 20 - 150        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C2-PFOA         | IS                                       | 93.7            | 60 - 130        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C8-PFOS         | IS                                       | 93.7            | 60 - 130        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |
| 13C2-PFDA         | IS                                       | 89.9            | 60 - 130        |                |   | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 01:54 | 1               |          |  |

**Sample ID: GW2001141525RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA03-MW1D

Matrix: Aqueous  
 Date Collected: 14-Jan-20 15:25

**Laboratory Data**

Lab Sample: 2000118-11  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 98.0 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 01:54 | 1 |
| d3-MeFOSAA   | IS | 94.3 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 01:54 | 1 |
| 13C2-PFUnA   | IS | 84.0 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 01:54 | 1 |
| d5-EtFOSAA   | IS | 96.7 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 01:54 | 1 |
| 13C2-PFDoA   | IS | 76.6 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 01:54 | 1 |
| 13C2-PFTeDA  | IS | 81.3 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 01:54 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

| Sample ID: GW2001161030RAP |  |              |          |                 |                 |            |           |           |                 | PFAS Isotope Dilution Method |          |         |
|----------------------------|--|--------------|----------|-----------------|-----------------|------------|-----------|-----------|-----------------|------------------------------|----------|---------|
| Client Data                |  |              |          | Laboratory Data |                 |            |           |           |                 |                              |          |         |
| Name:                      | Merit Laboratories, Inc.                 |              |          | Matrix:         | Aqueous         |            |           |           | Lab Sample:     | 2000118-12                   |          | Column: |
| Project:                   | Statewide WWTP Biosolids PFAS Evaluation |              |          | Date Collected: | 16-Jan-20 10:30 |            |           |           | Date Received:  | 21-Jan-20 09:42              |          | BEH C18 |
| Analyte                    | CAS Number                               | Conc. (ng/L) | DL       | LOD             | LOQ             | Qualifiers | Batch     | Extracted | Samp Size       | Analyzed                     | Dilution |         |
| PFBA                       | 375-22-4                                 | 4.45         | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFPeA                      | 2706-90-3                                | 2.02         | 1.39     | 2.02            | 4.04            | J          | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFBS                       | 375-73-5                                 | 4.22         | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| 4:2 FTS                    | 757124-72-4                              | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFHxA                      | 307-24-4                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFPeS                      | 2706-91-4                                | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFHpA                      | 375-85-9                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFHxS                      | 355-46-4                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| 6:2 FTS                    | 27619-97-2                               | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFOA                       | 335-67-1                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFHpS                      | 375-92-8                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFNA                       | 375-95-1                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFOSA                      | 754-91-6                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFOS                       | 1763-23-1                                | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFDA                       | 335-76-2                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| 8:2 FTS                    | 39108-34-4                               | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFNS                       | 68259-12-1                               | ND           | 1.96     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| MeFOSAA                    | 2355-31-9                                | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| EtFOSAA                    | 2991-50-6                                | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFUnA                      | 2058-94-8                                | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFDS                       | 335-77-3                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFDoA                      | 307-55-1                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFTrDA                     | 72629-94-8                               | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| PFTeDA                     | 376-06-7                                 | ND           | 1.39     | 2.02            | 4.04            |            | B0A0148   | 23-Jan-20 | 0.247 L         | 28-Jan-20 02:04              | 1        |         |
| Labeled Standards          | Type                                     | % Recovery   | Limits   |                 | Qualifiers      | Batch      | Extracted | Samp Size | Analyzed        | Dilution                     |          |         |
| 13C3-PFBA                  | IS                                       | 86.7         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C3-PFPeA                 | IS                                       | 88.8         | 60 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C3-PFBS                  | IS                                       | 93.2         | 60 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C2-4:2 FTS               | IS                                       | 88.5         | 20 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C2-PFHxA                 | IS                                       | 89.8         | 70 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C4-PFHpA                 | IS                                       | 86.3         | 60 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C3-PFHxS                 | IS                                       | 90.7         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C2-6:2 FTS               | IS                                       | 86.5         | 40 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C5-PFNA                  | IS                                       | 94.6         | 50 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C8-PFOSA                 | IS                                       | 68.5         | 20 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C2-PFOA                  | IS                                       | 86.4         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C8-PFOS                  | IS                                       | 90.8         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |
| 13C2-PFDA                  | IS                                       | 92.4         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.247 L   | 28-Jan-20 02:04 | 1                            |          |         |

**Sample ID: GW2001161030RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA04-MW1S

Matrix: Aqueous  
 Date Collected: 16-Jan-20 10:30

**Laboratory Data**

Lab Sample: 2000118-12  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 89.5 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 02:04 | 1 |
| d3-MeFOSAA   | IS | 86.2 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 02:04 | 1 |
| 13C2-PFUnA   | IS | 84.4 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 02:04 | 1 |
| d5-EtFOSAA   | IS | 92.4 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 02:04 | 1 |
| 13C2-PFDoA   | IS | 72.7 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 02:04 | 1 |
| 13C2-PFTeDA  | IS | 80.3 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.247 L | 28-Jan-20 02:04 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: GW2001161140RAP**
**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |             |            |                |                 |           |                 |                 |          |
|-------------------|--|-----------------|-----------------|-------------|------------|----------------|-----------------|-----------|-----------------|-----------------|----------|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample: | 2000118-13 | Date Received: | 21-Jan-20 09:42 | Column:   | BEH C18         |                 |          |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 16-Jan-20 11:40 |             |            |                |                 |           |                 |                 |          |
| Location:         | BRON-CA04-MW1D                           |                 |                 |             |            |                |                 |           |                 |                 |          |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD         | LOQ        | Qualifiers     | Batch           | Extracted | Samp Size       | Analyzed        | Dilution |
| PFBA              | 375-22-4                                 | 2.33            | 1.34            | 1.95        | 3.91       | J              | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFPeA             | 2706-90-3                                | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFBS              | 375-73-5                                 | 3.97            | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFHxA             | 307-24-4                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFPeS             | 2706-91-4                                | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFHpA             | 375-85-9                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFHxS             | 355-46-4                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFOA              | 335-67-1                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFHpS             | 375-92-8                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFNA              | 375-95-1                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFOSA             | 754-91-6                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFOS              | 1763-23-1                                | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFDA              | 335-76-2                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFNS              | 68259-12-1                               | ND              | 1.89            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| MeFOSAA           | 2355-31-9                                | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| EtFOSAA           | 2991-50-6                                | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFUnA             | 2058-94-8                                | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFDS              | 335-77-3                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFDoA             | 307-55-1                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFTrDA            | 72629-94-8                               | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| PFTeDA            | 376-06-7                                 | ND              | 1.34            | 1.95        | 3.91       |                | B0A0148         | 23-Jan-20 | 0.256 L         | 28-Jan-20 02:15 | 1        |
| Labeled Standards | Type                                     | % Recovery      | Limits          |             | Qualifiers | Batch          | Extracted       | Samp Size | Analyzed        | Dilution        |          |
| 13C3-PFBA         | IS                                       | 77.8            | 60 - 130        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C3-PFPeA        | IS                                       | 90.7            | 60 - 150        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C3-PFBS         | IS                                       | 96.5            | 60 - 150        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C2-4:2 FTS      | IS                                       | 113             | 20 - 150        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C2-PFHxA        | IS                                       | 90.9            | 70 - 130        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C4-PFHpA        | IS                                       | 91.4            | 60 - 150        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C3-PFHxS        | IS                                       | 97.9            | 60 - 130        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C2-6:2 FTS      | IS                                       | 96.0            | 40 - 150        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C5-PFNA         | IS                                       | 92.6            | 50 - 130        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C8-PFOSA        | IS                                       | 64.3            | 20 - 150        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C2-PFOA         | IS                                       | 92.9            | 60 - 130        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C8-PFOS         | IS                                       | 94.7            | 60 - 130        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |
| 13C2-PFDA         | IS                                       | 87.1            | 60 - 130        |             |            | B0A0148        | 23-Jan-20       | 0.256 L   | 28-Jan-20 02:15 | 1               |          |

**Sample ID: GW2001161140RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA04-MW1D

Matrix: Aqueous  
 Date Collected: 16-Jan-20 11:40

**Laboratory Data**

Lab Sample: 2000118-13  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 92.4 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.256 L | 28-Jan-20 02:15 | 1 |
| d3-MeFOSAA   | IS | 91.6 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.256 L | 28-Jan-20 02:15 | 1 |
| 13C2-PFUnA   | IS | 83.1 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.256 L | 28-Jan-20 02:15 | 1 |
| d5-EtFOSAA   | IS | 89.2 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.256 L | 28-Jan-20 02:15 | 1 |
| 13C2-PFDoA   | IS | 73.8 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.256 L | 28-Jan-20 02:15 | 1 |
| 13C2-PFTeDA  | IS | 81.7 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.256 L | 28-Jan-20 02:15 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

| Sample ID: GW2001161305RAP |  |                 |                 |                 |                 |            |           |           |                 | PFAS Isotope Dilution Method |          |  |  |
|----------------------------|--|-----------------|-----------------|-----------------|-----------------|------------|-----------|-----------|-----------------|------------------------------|----------|--|--|
| Client Data                |  |                 |                 | Laboratory Data |                 |            |           |           |                 |                              |          |  |  |
| Name:                      | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample:     | 2000118-14      | Column:    | BEH C18   |           |                 |                              |          |  |  |
| Project:                   | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 16-Jan-20 13:05 | Date Received:  | 21-Jan-20 09:42 |            |           |           |                 |                              |          |  |  |
| Location:                  | BRON-CA05-MW1S                           |                 |                 |                 |                 |            |           |           |                 |                              |          |  |  |
| Analyte                    | CAS Number                               | Conc. (ng/L)    | DL              | LOD             | LOQ             | Qualifiers | Batch     | Extracted | Samp Size       | Analyzed                     | Dilution |  |  |
| PFBA                       | 375-22-4                                 | 2.84            | 1.40            | 2.05            | 4.10            | J          | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFPeA                      | 2706-90-3                                | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFBS                       | 375-73-5                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| 4:2 FTS                    | 757124-72-4                              | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFHxA                      | 307-24-4                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFPeS                      | 2706-91-4                                | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFHpA                      | 375-85-9                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFHxS                      | 355-46-4                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| 6:2 FTS                    | 27619-97-2                               | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFOA                       | 335-67-1                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFHpS                      | 375-92-8                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFNA                       | 375-95-1                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFOSA                      | 754-91-6                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFOS                       | 1763-23-1                                | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFDA                       | 335-76-2                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| 8:2 FTS                    | 39108-34-4                               | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFNS                       | 68259-12-1                               | ND              | 1.98            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| MeFOSAA                    | 2355-31-9                                | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| EtFOSAA                    | 2991-50-6                                | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFUnA                      | 2058-94-8                                | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFDS                       | 335-77-3                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFDoA                      | 307-55-1                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFTrDA                     | 72629-94-8                               | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| PFTeDA                     | 376-06-7                                 | ND              | 1.40            | 2.05            | 4.10            |            | B0A0148   | 23-Jan-20 | 0.244 L         | 28-Jan-20 02:25              | 1        |  |  |
| Labeled Standards          | Type                                     | % Recovery      | Limits          |                 | Qualifiers      | Batch      | Extracted | Samp Size | Analyzed        | Dilution                     |          |  |  |
| 13C3-PFBA                  | IS                                       | 89.0            | 60 - 130        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C3-PFPeA                 | IS                                       | 90.2            | 60 - 150        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C3-PFBS                  | IS                                       | 105             | 60 - 150        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C2-4:2 FTS               | IS                                       | 101             | 20 - 150        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C2-PFHxA                 | IS                                       | 90.3            | 70 - 130        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C4-PFHpA                 | IS                                       | 91.9            | 60 - 150        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C3-PFHxS                 | IS                                       | 96.4            | 60 - 130        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C2-6:2 FTS               | IS                                       | 83.5            | 40 - 150        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C5-PFNA                  | IS                                       | 87.0            | 50 - 130        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C8-PFOSA                 | IS                                       | 59.6            | 20 - 150        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C2-PFOA                  | IS                                       | 87.0            | 60 - 130        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C8-PFOS                  | IS                                       | 84.2            | 60 - 130        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |
| 13C2-PFDA                  | IS                                       | 92.2            | 60 - 130        |                 |                 | B0A0148    | 23-Jan-20 | 0.244 L   | 28-Jan-20 02:25 | 1                            |          |  |  |

**Sample ID: GW2001161305RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA05-MW1S

Matrix: Aqueous  
 Date Collected: 16-Jan-20 13:05

**Laboratory Data**

Lab Sample: 2000118-14  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 76.1 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.244 L | 28-Jan-20 02:25 | 1 |
| d3-MeFOSAA   | IS | 93.4 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.244 L | 28-Jan-20 02:25 | 1 |
| 13C2-PFUnA   | IS | 80.2 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.244 L | 28-Jan-20 02:25 | 1 |
| d5-EtFOSAA   | IS | 89.0 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.244 L | 28-Jan-20 02:25 | 1 |
| 13C2-PFDmA   | IS | 69.5 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.244 L | 28-Jan-20 02:25 | 1 |
| 13C2-PFTeDA  | IS | 76.9 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.244 L | 28-Jan-20 02:25 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

| Sample ID: GW2001161400RAP |  |              |          |                 |                 |            |           |           |                 | PFAS Isotope Dilution Method |          |         |
|----------------------------|--|--------------|----------|-----------------|-----------------|------------|-----------|-----------|-----------------|------------------------------|----------|---------|
| Client Data                |  |              |          | Laboratory Data |                 |            |           |           |                 |                              |          |         |
| Name:                      | Merit Laboratories, Inc.                 |              |          | Matrix:         | Aqueous         |            |           |           | Lab Sample:     | 2000118-15                   |          | Column: |
| Project:                   | Statewide WWTP Biosolids PFAS Evaluation |              |          | Date Collected: | 16-Jan-20 14:00 |            |           |           | Date Received:  | 21-Jan-20 09:42              |          | BEH C18 |
| Analyte                    | CAS Number                               | Conc. (ng/L) | DL       | LOD             | LOQ             | Qualifiers | Batch     | Extracted | Samp Size       | Analyzed                     | Dilution |         |
| PFBA                       | 375-22-4                                 | 2.59         | 1.38     | 2.01            | 4.02            | J          | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFPeA                      | 2706-90-3                                | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFBS                       | 375-73-5                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| 4:2 FTS                    | 757124-72-4                              | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFHxA                      | 307-24-4                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFPeS                      | 2706-91-4                                | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFHpA                      | 375-85-9                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFHxS                      | 355-46-4                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| 6:2 FTS                    | 27619-97-2                               | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFOA                       | 335-67-1                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFHpS                      | 375-92-8                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFNA                       | 375-95-1                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFOSA                      | 754-91-6                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFOS                       | 1763-23-1                                | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFDA                       | 335-76-2                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| 8:2 FTS                    | 39108-34-4                               | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFNS                       | 68259-12-1                               | ND           | 1.94     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| MeFOSAA                    | 2355-31-9                                | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| EtFOSAA                    | 2991-50-6                                | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFUnA                      | 2058-94-8                                | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFDS                       | 335-77-3                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFDoA                      | 307-55-1                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFTrDA                     | 72629-94-8                               | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| PFTeDA                     | 376-06-7                                 | ND           | 1.38     | 2.01            | 4.02            |            | B0A0148   | 23-Jan-20 | 0.249 L         | 28-Jan-20 02:36              | 1        |         |
| Labeled Standards          | Type                                     | % Recovery   | Limits   |                 | Qualifiers      | Batch      | Extracted | Samp Size | Analyzed        | Dilution                     |          |         |
| 13C3-PFBA                  | IS                                       | 88.7         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C3-PFPcA                 | IS                                       | 99.0         | 60 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C3-PFBS                  | IS                                       | 96.0         | 60 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C2-4:2 FTS               | IS                                       | 95.3         | 20 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C2-PFHxA                 | IS                                       | 97.0         | 70 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C4-PFHpA                 | IS                                       | 99.8         | 60 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C3-PFHxS                 | IS                                       | 90.4         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C2-6:2 FTS               | IS                                       | 90.1         | 40 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C5-PFNA                  | IS                                       | 98.6         | 50 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C8-PFOSA                 | IS                                       | 79.3         | 20 - 150 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C2-PFOA                  | IS                                       | 93.5         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C8-PFOS                  | IS                                       | 90.0         | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |
| 13C2-PFDA                  | IS                                       | 103          | 60 - 130 |                 |                 | B0A0148    | 23-Jan-20 | 0.249 L   | 28-Jan-20 02:36 | 1                            |          |         |

**Sample ID: GW2001161400RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA05-MW1D

Matrix: Aqueous  
 Date Collected: 16-Jan-20 14:00

**Laboratory Data**

Lab Sample: 2000118-15  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 132  | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:36 | 1 |
| d3-MeFOSAA   | IS | 82.8 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:36 | 1 |
| 13C2-PFUnA   | IS | 92.9 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:36 | 1 |
| d5-EtFOSAA   | IS | 107  | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:36 | 1 |
| 13C2-PFDoA   | IS | 71.4 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:36 | 1 |
| 13C2-PFTeDA  | IS | 82.0 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:36 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: GW2001161500RAP**
**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |             |            |                |                 |                 |           |                 |          |
|-------------------|--|-----------------|-----------------|-------------|------------|----------------|-----------------|-----------------|-----------|-----------------|----------|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample: | 2000118-16 | Date Received: | 21-Jan-20 09:42 | Column:         | BEH C18   |                 |          |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 16-Jan-20 15:00 |             |            |                |                 |                 |           |                 |          |
| Location:         | BRON-CA05-MW2S                           |                 |                 |             |            |                |                 |                 |           |                 |          |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD         | LOQ        | Qualifiers     | Batch           | Extracted       | Samp Size | Analyzed        | Dilution |
| PFBA              | 375-22-4                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFPeA             | 2706-90-3                                | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFBS              | 375-73-5                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFHxA             | 307-24-4                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFPeS             | 2706-91-4                                | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFHpA             | 375-85-9                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFHxS             | 355-46-4                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFOA              | 335-67-1                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFHpS             | 375-92-8                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFNA              | 375-95-1                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFOSA             | 754-91-6                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFOS              | 1763-23-1                                | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFDA              | 335-76-2                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFNS              | 68259-12-1                               | ND              | 1.87            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| MeFOSAA           | 2355-31-9                                | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| EtFOSAA           | 2991-50-6                                | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFUnA             | 2058-94-8                                | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFDS              | 335-77-3                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFDoA             | 307-55-1                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PTFrDA            | 72629-94-8                               | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| PFTeDA            | 376-06-7                                 | ND              | 1.32            | 1.93        | 3.86       |                | B0A0148         | 23-Jan-20       | 0.259 L   | 28-Jan-20 02:46 | 1        |
| Labeled Standards | Type                                     | % Recovery      | Limits          | Qualifiers  | Batch      | Extracted      | Samp Size       | Analyzed        | Dilution  |                 |          |
| 13C3-PFBA         | IS                                       | 97.4            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C3-PFPcA        | IS                                       | 90.8            | 60 - 150        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C3-PFBS         | IS                                       | 101             | 60 - 150        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C2-4:2 FTS      | IS                                       | 91.5            | 20 - 150        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C2-PFHxA        | IS                                       | 91.1            | 70 - 130        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C4-PFHpA        | IS                                       | 86.6            | 60 - 150        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C3-PFHxS        | IS                                       | 99.6            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C2-6:2 FTS      | IS                                       | 93.3            | 40 - 150        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C5-PFNA         | IS                                       | 91.9            | 50 - 130        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C8-PFOSA        | IS                                       | 62.0            | 20 - 150        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C2-PFOA         | IS                                       | 91.7            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C8-PFOS         | IS                                       | 94.0            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |
| 13C2-PFDA         | IS                                       | 87.8            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.259 L         | 28-Jan-20 02:46 | 1         |                 |          |

**Sample ID: GW2001161500RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA05-MW2S

Matrix: Aqueous  
 Date Collected: 16-Jan-20 15:00

**Laboratory Data**

Lab Sample: 2000118-16  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 84.6 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.259 L | 28-Jan-20 02:46 | 1 |
| d3-MeFOSAA   | IS | 83.5 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.259 L | 28-Jan-20 02:46 | 1 |
| 13C2-PFUnA   | IS | 78.6 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.259 L | 28-Jan-20 02:46 | 1 |
| d5-EtFOSAA   | IS | 88.6 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.259 L | 28-Jan-20 02:46 | 1 |
| 13C2-PFDaA   | IS | 72.9 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.259 L | 28-Jan-20 02:46 | 1 |
| 13C2-PFTeDA  | IS | 80.1 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.259 L | 28-Jan-20 02:46 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: GW2001161500RAP-FD**
**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |             |            |                |                 |                 |           |                 |          |
|-------------------|--|-----------------|-----------------|-------------|------------|----------------|-----------------|-----------------|-----------|-----------------|----------|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample: | 2000118-17 | Date Received: | 21-Jan-20 09:42 | Column:         | BEH C18   |                 |          |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 16-Jan-20 15:00 |             |            |                |                 |                 |           |                 |          |
| Location:         | BRON-CA05-MW2S                           |                 |                 |             |            |                |                 |                 |           |                 |          |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD         | LOQ        | Qualifiers     | Batch           | Extracted       | Samp Size | Analyzed        | Dilution |
| PFBA              | 375-22-4                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFPeA             | 2706-90-3                                | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFBS              | 375-73-5                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFHxA             | 307-24-4                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFPeS             | 2706-91-4                                | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFHpA             | 375-85-9                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFHxS             | 355-46-4                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFOA              | 335-67-1                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFHpS             | 375-92-8                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFNA              | 375-95-1                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFOSA             | 754-91-6                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFOS              | 1763-23-1                                | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFDA              | 335-76-2                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFNS              | 68259-12-1                               | ND              | 1.95            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| MeFOSAA           | 2355-31-9                                | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| EtFOSAA           | 2991-50-6                                | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFUnA             | 2058-94-8                                | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFDS              | 335-77-3                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFDoA             | 307-55-1                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PTFrDA            | 72629-94-8                               | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| PFTeDA            | 376-06-7                                 | ND              | 1.38            | 2.01        | 4.02       |                | B0A0148         | 23-Jan-20       | 0.249 L   | 28-Jan-20 02:57 | 1        |
| Labeled Standards | Type                                     | % Recovery      | Limits          | Qualifiers  | Batch      | Extracted      | Samp Size       | Analyzed        | Dilution  |                 |          |
| 13C3-PFBA         | IS                                       | 90.3            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C3-PFPcA        | IS                                       | 91.8            | 60 - 150        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C3-PFBS         | IS                                       | 93.9            | 60 - 150        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C2-4:2 FTS      | IS                                       | 96.4            | 20 - 150        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C2-PFHxA        | IS                                       | 93.1            | 70 - 130        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C4-PFHpA        | IS                                       | 89.5            | 60 - 150        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C3-PFHxS        | IS                                       | 87.8            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C2-6:2 FTS      | IS                                       | 99.1            | 40 - 150        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C5-PFNA         | IS                                       | 93.8            | 50 - 130        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C8-PFOSA        | IS                                       | 61.3            | 20 - 150        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C2-PFOA         | IS                                       | 90.3            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C8-PFOS         | IS                                       | 92.1            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |
| 13C2-PFDA         | IS                                       | 92.6            | 60 - 130        |             | B0A0148    | 23-Jan-20      | 0.249 L         | 28-Jan-20 02:57 | 1         |                 |          |

**Sample ID: GW2001161500RAP-FD**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA05-MW2S

Matrix: Aqueous  
 Date Collected: 16-Jan-20 15:00

**Laboratory Data**

Lab Sample: 2000118-17  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 89.3 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:57 | 1 |
| d3-MeFOSAA   | IS | 91.9 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:57 | 1 |
| 13C2-PFUnA   | IS | 76.9 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:57 | 1 |
| d5-EtFOSAA   | IS | 88.2 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:57 | 1 |
| 13C2-PFDoA   | IS | 73.5 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:57 | 1 |
| 13C2-PFTeDA  | IS | 74.8 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.249 L | 28-Jan-20 02:57 | 1 |

DL - Detection Limit

LOD - Limit of Detection

Results reported to the DL.

LOQ - Limit of quantitation

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

**Sample ID: GW2001161615RAP**
**PFAS Isotope Dilution Method**

| Client Data       |  | Laboratory Data |                 |                |                 |            |           |           |                 |                 |          |
|-------------------|--|-----------------|-----------------|----------------|-----------------|------------|-----------|-----------|-----------------|-----------------|----------|
| Name:             | Merit Laboratories, Inc.                 | Matrix:         | Aqueous         | Lab Sample:    | 2000118-18      | Column:    | BEH C18   |           |                 |                 |          |
| Project:          | Statewide WWTP Biosolids PFAS Evaluation | Date Collected: | 16-Jan-20 16:15 | Date Received: | 21-Jan-20 09:42 |            |           |           |                 |                 |          |
| Analyte           | CAS Number                               | Conc. (ng/L)    | DL              | LOD            | LOQ             | Qualifiers | Batch     | Extracted | Samp Size       | Analyzed        | Dilution |
| PFBA              | 375-22-4                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFPeA             | 2706-90-3                                | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFBS              | 375-73-5                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| 4:2 FTS           | 757124-72-4                              | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFHxA             | 307-24-4                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFPeS             | 2706-91-4                                | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFHpA             | 375-85-9                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFHxS             | 355-46-4                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| 6:2 FTS           | 27619-97-2                               | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFOA              | 335-67-1                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFHpS             | 375-92-8                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFNA              | 375-95-1                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFOSA             | 754-91-6                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFOS              | 1763-23-1                                | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFDA              | 335-76-2                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| 8:2 FTS           | 39108-34-4                               | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFNS              | 68259-12-1                               | ND              | 1.92            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| MeFOSAA           | 2355-31-9                                | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| EtFOSAA           | 2991-50-6                                | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFUnA             | 2058-94-8                                | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFDS              | 335-77-3                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFDoA             | 307-55-1                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFTrDA            | 72629-94-8                               | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| PFTeDA            | 376-06-7                                 | ND              | 1.36            | 1.99           | 3.98            |            | B0A0148   | 23-Jan-20 | 0.251 L         | 28-Jan-20 03:07 | 1        |
| Labeled Standards | Type                                     | % Recovery      | Limits          |                | Qualifiers      | Batch      | Extracted | Samp Size | Analyzed        | Dilution        |          |
| 13C3-PFBA         | IS                                       | 91.2            | 60 - 130        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C3-PFPeA        | IS                                       | 96.4            | 60 - 150        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C3-PFBS         | IS                                       | 94.5            | 60 - 150        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C2-4:2 FTS      | IS                                       | 95.3            | 20 - 150        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C2-PFHxA        | IS                                       | 92.6            | 70 - 130        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C4-PFHpA        | IS                                       | 92.2            | 60 - 150        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C3-PFHxS        | IS                                       | 102             | 60 - 130        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C2-6:2 FTS      | IS                                       | 91.1            | 40 - 150        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C5-PFNA         | IS                                       | 90.2            | 50 - 130        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C8-PFOSA        | IS                                       | 69.1            | 20 - 150        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C2-PFOA         | IS                                       | 91.9            | 60 - 130        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C8-PFOS         | IS                                       | 91.6            | 60 - 130        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |
| 13C2-PFDA         | IS                                       | 89.7            | 60 - 130        |                |                 | B0A0148    | 23-Jan-20 | 0.251 L   | 28-Jan-20 03:07 | 1               |          |

**Sample ID: GW2001161615RAP**
**PFAS Isotope Dilution Method**
**Client Data**

Name: Merit Laboratories, Inc.  
 Project: Statewide WWTP Biosolids PFAS Evaluation  
 Location: BRON-CA05-MW2D

Matrix: Aqueous  
 Date Collected: 16-Jan-20 16:15

**Laboratory Data**

Lab Sample: 2000118-18  
 Date Received: 21-Jan-20 09:42  
 Column: BEH C18

**Labeled Standards**
**Type**
**% Recovery**
**Limits**
**Qualifiers**
**Batch**
**Extracted**
**Samp Size**
**Analyzed**
**Dilution**

|              |    |      |          |  |         |           |         |                 |   |
|--------------|----|------|----------|--|---------|-----------|---------|-----------------|---|
| 13C2-8:2 FTS | IS | 81.4 | 40 - 150 |  | B0A0148 | 23-Jan-20 | 0.251 L | 28-Jan-20 03:07 | 1 |
| d3-MeFOSAA   | IS | 88.6 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.251 L | 28-Jan-20 03:07 | 1 |
| 13C2-PFUnA   | IS | 82.5 | 60 - 130 |  | B0A0148 | 23-Jan-20 | 0.251 L | 28-Jan-20 03:07 | 1 |
| d5-EtFOSAA   | IS | 89.6 | 50 - 150 |  | B0A0148 | 23-Jan-20 | 0.251 L | 28-Jan-20 03:07 | 1 |
| 13C2-PFDoA   | IS | 68.0 | 30 - 130 |  | B0A0148 | 23-Jan-20 | 0.251 L | 28-Jan-20 03:07 | 1 |
| 13C2-PFTeDA  | IS | 78.3 | 20 - 150 |  | B0A0148 | 23-Jan-20 | 0.251 L | 28-Jan-20 03:07 | 1 |

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

## DATA QUALIFIERS & ABBREVIATIONS

|       |   |
|-------|---|
| B     | This compound was also detected in the method blank                                     |
| Conc. | Concentration   |
| CRS   | Cleanup Recovery Standard   |
| D     | Dilution  |
| DL    | Detection limit   |
| E     | The associated compound concentration exceeded the calibration range of the instrument  |
| H     | Recovery and/or RPD was outside laboratory acceptance limits                            |
| I     | Chemical Interference   |
| IS    | Internal Standard   |
| J     | The amount detected is below the Reporting Limit/LOQ                                    |
| LOD   | Limit of Detection  |
| LOQ   | Limit of Quantitation   |
| M     | Estimated Maximum Possible Concentration (CA Region 2 projects only)                    |
| NA    | Not applicable  |
| ND    | Not Detected  |
| OPR   | Ongoing Precision and Recovery sample   |
| P     | The reported concentration may include contribution from chlorinated diphenyl ether(s). |
| Q     | The ion transition ratio is outside of the acceptance criteria.                         |
| RL    | Reporting Limit   |
| TEQ   | Toxic Equivalency   |
| U     | Not Detected (specific projects only)   |
| *     | See Cover Letter  |

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

## Vista Analytical Laboratory Certifications

| <b>Accrediting Authority</b>                         | <b>Certificate Number</b> |
|--|---------------------------|
| Alaska Department of Environmental Conservation      | 17-013                    |
| Arkansas Department of Environmental Quality         | 19-013-0                  |
| California Department of Health – ELAP               | 2892                      |
| DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005      | 3091.01                   |
| Florida Department of Health                         | E87777-23                 |
| Hawaii Department of Health                          | N/A                       |
| Louisiana Department of Environmental Quality        | 01977                     |
| Maine Department of Health                           | 2018017                   |
| Massachusetts Department of Environmental Protection | N/A                       |
| Michigan Department of Environmental Quality         | 9932                      |
| Minnesota Department of Health                       | 1521520                   |
| New Hampshire Environmental Accreditation Program    | 207718-B                  |
| New Jersey Department of Environmental Protection    | 190001                    |
| New York Department of Health                        | 11411                     |
| Oregon Laboratory Accreditation Program              | 4042-010                  |
| Pennsylvania Department of Environmental Protection  | 016                       |
| Texas Commission on Environmental Quality            | T104704189-19-10          |
| Vermont Department of Health                         | VT-4042                   |
| Virginia Department of General Services              | 10272                     |
| Washington Department of Ecology                     | C584-19                   |
| Wisconsin Department of Natural Resources            | 998036160                 |

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

| MATRIX: Air  |           |
|--|-----------|
| Description of Test  | Method    |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA 23    |
| Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans | EPA TO-9A |

| MATRIX: Biological Tissue   |                |
|---|----------------|
| Description of Test   | Method         |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS              | EPA 1613B      |
| Brominated Diphenyl Ethers by HRGC/HRMS   | EPA 1614A      |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS              | EPA 1668A/C    |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS                     | EPA 1699       |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS                            | EPA 537        |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS              | EPA 8280A/B    |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Drinking Water   |                |
|--|----------------|
| Description of Test  | Method         |
| 2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS      | EPA 1613/1613B |
| 1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS            | EPA 522        |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | EPA 537        |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS | ISO 25101 2009 |

| MATRIX: Non-Potable Water   |                |
|---|----------------|
| Description of Test   | Method         |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS              | EPA 1613B      |
| Brominated Diphenyl Ethers by HRGC/HRMS   | EPA 1614A      |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS              | EPA 1668A/C    |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS                     | EPA 1699       |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS                            | EPA 537        |
| Dioxin by GC/HRMS   | EPA 613        |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS              | EPA 8280A/B    |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

| MATRIX: Solids  |                |
|---|----------------|
| Description of Test   | Method         |
| Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS                       | EPA 1613       |
| Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS              | EPA 1613B      |
| Brominated Diphenyl Ethers by HRGC/HRMS   | EPA 1614A      |
| Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS              | EPA 1668A/C    |
| Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS                     | EPA 1699       |
| Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS                            | EPA 537        |
| Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS              | EPA 8280A/B    |
| Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS | EPA 8290/8290A |

Revised CoC - rec'd via client email on 01/29/20 (J)



## CHAIN OF CUSTODY

|   |                 |
|---|-----------------|
| <b>For Laboratory Use Only</b>  |                 |
| Work Order #:   | <u>2000118B</u> |
| Temp:   | _____ °C        |
| Storage ID:   | _____           |
| Storage Secured: Yes <input type="checkbox"/> No <input type="checkbox"/> |                 |

Project ID: Statewide WWTP Biosolids PFAS Evaluation

PO#: 60588767.01

Sampler: Russell Platte

(name)

TAT Standard:  21 days

(check one): Rush (surcharge may apply)

14 days  7 days

Specify: \_\_\_\_\_

|   |                        |   |                        |                    |                            |                             |
|---|------------------------|---|------------------------|--------------------|----------------------------|-----------------------------|
| Invoice to: Name<br><u>Stephanie Kammer</u> | Company<br><u>MDEQ</u> | Address<br><u>525 W. Allegan Street</u> | City<br><u>Lansing</u> | State<br><u>MI</u> | Ph#<br><u>517-897-1597</u> | Fax#<br><u>517-241-3571</u> |
|---|------------------------|---|------------------------|--------------------|----------------------------|-----------------------------|

|  |      |      |  |      |      |
|--|------|------|--|------|------|
| Relinquished by (printed name and signature) | Date | Time | Received by (printed name and signature) | Date | Time |
|--|------|------|--|------|------|

|  |      |      |  |      |      |
|--|------|------|--|------|------|
| Relinquished by (printed name and signature) | Date | Time | Received by (printed name and signature) | Date | Time |
|--|------|------|--|------|------|

| SHIP TO: Vista Analytical Laboratory<br>1104 Windfield Way<br>El Dorado Hills, CA 95762<br>Ph: (916) 673-1520; Fax: (916) 673-0106 |         |       |                             | Method of Shipment:<br>_____<br>ATTN: <u>Jennifer Miller</u> | Tracking No.:<br>_____ | Add Analysis(es) Requested | PFAS Isotope Dilution |                      |            |                      |            |                          |           | US EPA Method 637 |               |  |  |
|--|---------|-------|-----------------------------|--|------------------------|----------------------------|-----------------------|----------------------|------------|----------------------|------------|--------------------------|-----------|-------------------|---------------|--|--|
| Sample ID  | Date    | Time  | Location/Sample Description | Container(s)   |                        |                            |                       |                      |            |                      | Comments   |                          |           |                   |               |  |  |
|  |         |       |                             | Quantity   | Type                   | Matrix                     | List of 21            | List of 21 Vissomers | List of 24 | List of 24 Vissomers | List of 28 | Other: Please List Below | PFOA/PFOS | UCMR3 PFAS List:6 | PFAS List: 14 |  |  |
| GW2001141450RAP  | 1/14/20 | 14:50 | BRON-CA03-MW1S              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001141525RAP  | 1/14/20 | 15:25 | BRON-CA03-MW1D              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001161030RAP  | 1/16/20 | 10:30 | BRON-CA04-MW1S              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001161140RAP  | 1/16/20 | 11:40 | BRON-CA04-MW1D              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001161305RAP  | 1/16/20 | 13:05 | BRON-CA05-MW1S              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001161400RAP  | 1/16/20 | 14:00 | BRON-CA05-MW1D              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001161500RAP  | 1/16/20 | 15:00 | BRON-CA05-MW2S              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001161500RAP-FD   | 1/16/20 | 15:00 | BRON-CA05-MW2S              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |
| GW2001161615RAP  | 1/16/20 | 16:15 | BRON-CA05-MW2D              | 2  | P                      | AQ                         |                       | X                    |            |                      |            |                          |           |                   |               |  |  |

Special Instructions/Comments: Send Results and Acknowledgements to the list provided

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SEND  
DOCUMENTATION  
AND RESULTS TO:

Name: Stephanie Kammer  
Company: MDEQ  
Address: 525 W. Allegan Street, Constitution Hall, 1st South West  
City: Lansing State: MI Zip: 30242  
Phone: 517-897-1597 Fax: 517-241-3571  
Email: dorin.bogdan@aecom.com

Container Types: P= HDPE, PJ= HDPE Jar

O = Other: \_\_\_\_\_

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma: \_\_\_\_\_

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: \_\_\_\_\_



## CHAIN OF CUSTODY

For Laboratory Use Only  
 Work Order #: 2000118 Temp: 1.3 °C  
 Storage ID: R-13, WWR-2 Storage Secured: Yes  No

Project ID: Statewide WWTP Biosolids PFAS Evaluation PO#: 60588767.01 Sampler: Russell Platte  
 (name)

TAT Standard:  21 days  
 (check one): Rush (surcharge may apply)  
 14 days  7 days Specify: \_\_\_\_\_

Invoice to: Name Stephanie Kammer Company MDEQ Address 525 W. Allegan Street City Lansing State MI Ph# 517-897-1597 Fax# 517-241-3571

Relinquished by (printed name and signature) Russell Platte Date 12/20/20 Time 16:30 Received by (printed name and signature) Ashwani Kravash Date 01/21/20 Time 0942  
 Relinquished by (printed name and signature) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ Received by (printed name and signature) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

| SHIP TO: Vista Analytical Laboratory<br>1104 Windfield Way<br>El Dorado Hills, CA 95762<br>Ph: (916) 673-1520; Fax: (916) 673-0106 |               |              |           | Method of Shipment: | Add Analysis(es) Requested |                       |            |                       |            |                          |           |                    | Comments     |  |
|--|---------------|--------------|-----------|---------------------|----------------------------|-----------------------|------------|-----------------------|------------|--------------------------|-----------|--------------------|--------------|--|
| ATTN: <u>Jennifer Miller</u>   | Tracking No.: | Container(s) |           |                     |                            | PFAS Isotope Dilution |            |                       |            | USEPA Method 537         |           |                    |              |  |
|  |               | Quantity     | Type      | Matrix              | List or 21                 | List or 21 w/ solvers | List or 24 | List or 24 w/ solvers | List or 28 | Other: Please List Below | PFOA/PFOS | UICMR3 PFAS List 6 | PFAS List 14 |  |
| GW2001131025RAP  | 1/13/20       | 10:25        | DT01-MW1S | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001131155RAP  | 1/13/20       | 11:55        | DT01-MW1D | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001131320RAP  | 1/13/20       | 13:20        | DT01-MW2S | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001131320RAP-FD   | 1/13/20       | 13:20        | DT01-MW2S | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001131435RAP  | 1/13/20       | 14:35        | DT01-MW2D | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001131535RAP  | 1/13/20       | 15:35        | DT02-MW2S | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001131620RAP  | 1/13/20       | 16:20        | DT02-MW2D | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001141055RAP  | 1/14/20       | 10:55        | DT02-MW1S | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001141210RAP  | 1/14/20       | 12:10        | DT02-MW1D | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |
| GW2001141450RAP  | 1/14/20       | 14:50        | CA03-MW1S | 2                   | P                          | AQ                    |            | X                     |            |                          |           |                    |              |  |

Special Instructions/Comments: Send Results and Acknowledgements to the list provided

SEND DOCUMENTATION AND RESULTS TO:

Name: Stephanie Kammer  
 Company: MDEQ  
 Address: 525 W. Allegan Street, Constitution Hall, 1st South West  
 City: Lansing State: MI Zip: 30242  
 Phone: 517-897-1597 Fax: 517-241-3571  
 Email: dorin.bogdan@aecom.com

Container Types: P = HDPE, PJ = HDPE Jar

O = Other:

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:



## CHAIN OF CUSTODY

|                                |             |  |
|--------------------------------|-------------|--|
| <b>For Laboratory Use Only</b> |             |  |
| Work Order #:                  | 2000118     | Temp: 16.3 °C  |
| Storage ID:                    | R-13, WWR-2 | Storage Secured: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> |

Project ID: Statewide WWTP Biosolids PFAS Evaluation PO#: 60588767.01 Sampler: Russell Platte  
(name)

TAT Standard:  21 days  
(check one): Rush (surcharge may apply)  
 14 days  7 days Specify: \_\_\_\_\_

Invoice to: Name Company Address City State Ph# Fax#  
Stephanie Kammer MDEQ 525 W. Allegan Street Lansing MI 517-897-1597 517-241-3571

Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time  
*Russell Platte Russell Platte* 12/14/20 16:30 *Ashwani Rukash Ashwani Rukash* 01/14/20 0942

Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

| SHIP TO:           | Method of Shipment: | Add Analysis(es) Requested |                             |          |      |        |           |                      |           | Comments             |           |                          |           |                  |               |                  |
|--------------------|---------------------|----------------------------|-----------------------------|----------|------|--------|-----------|----------------------|-----------|----------------------|-----------|--------------------------|-----------|------------------|---------------|------------------|
|                    |                     | Container(s)               |                             |          |      |        |           |                      |           |                      |           |                          |           |                  |               |                  |
| Sample ID          | Date                | Time                       | Location/Sample Description | Quantity | Type | Matrix | LSt or 21 | LSt or 21 w/ solvers | LSt or 24 | LSt or 24 w/ solvers | LSt or 28 | Other: Please List Below | PFOA/PFOS | UICMR3 PFAS List | PFAS List: 14 | USEPA Method 537 |
| GW2001141525RAP    | 1/14/20             | 15:25                      | CA03-MW1D                   | 2        | P    | AQ     |           | X                    |           |                      |           |                          |           |                  |               |                  |
| GW2001161030RAP    | 1/16/20             | 10:30                      | CA04-MW1S                   | 2        | P    | AQ     |           |                      | X         |                      |           |                          |           |                  |               |                  |
| GW2001161140RAP    | 1/16/20             | 11:40                      | CA04-MW1D                   | 2        | P    | AQ     |           |                      | X         |                      |           |                          |           |                  |               |                  |
| GW2001161305RAP    | 1/16/20             | 13:05                      | CA05-MW1S                   | 2        | P    | AQ     |           |                      | X         |                      |           |                          |           |                  |               |                  |
| GW2001161400RAP    | 1/16/20             | 14:00                      | CA05-MW1D                   | 2        | P    | AQ     |           |                      | X         |                      |           |                          |           |                  |               |                  |
| GW2001161500RAP    | 1/16/20             | 15:00                      | CA05-MW2S                   | 2        | P    | AQ     |           |                      | X         |                      |           |                          |           |                  |               |                  |
| GW2001161500RAP-FD | 1/16/20             | 15:00                      | CA05-MW2S                   | 2        | P    | AQ     |           |                      | X         |                      |           |                          |           |                  |               |                  |
| GW2001161615RAP    | 1/16/20             | 16:15                      | CA05-MW2D                   | 2        | P    | AQ     |           |                      | X         |                      |           |                          |           |                  |               |                  |
|                    |                     |                            |                             |          |      |        |           |                      |           |                      |           |                          |           |                  |               |                  |
|                    |                     |                            |                             |          |      |        |           |                      |           |                      |           |                          |           |                  |               |                  |
|                    |                     |                            |                             |          |      |        |           |                      |           |                      |           |                          |           |                  |               |                  |

Special Instructions/Comments: Send Results and Acknowledgements to the list provided

SEND DOCUMENTATION AND RESULTS TO:

Name: Stephanie Kammer  
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O = Other: \_\_\_\_\_

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma: \_\_\_\_\_

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

SL = Sludge, BS=Biosolids, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: \_\_\_\_\_

# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 2000118

TAT Std

|                                   |                                   |                        |                          |         |                          |                             |       |
|-----------------------------------|-----------------------------------|------------------------|--------------------------|---------|--------------------------|-----------------------------|-------|
| Samples Arrival:                  | Date/Time<br><u>01/21/20 0942</u> | Initials:<br><u>AP</u> | Location:<br><u>WR-2</u> |         |                          |                             |       |
| Delivered By:                     | FedEx                             | UPS                    | On Trac                  | GSO     | DHL                      | Hand Delivered              | Other |
| Preservation:                     | Ice                               |                        | Blue Ice                 | Dry Ice |                          |                             | None  |
| Temp °C: <u>1.3</u> (uncorrected) |                                   |                        |                          |         | Probe used: Y / <u>N</u> | Thermometer ID: <u>JR-4</u> |       |
| Temp °C: <u>1.3</u> (corrected)   |                                   |                        |                          |         |                          |                             |       |

|   | YES                     | NO   | NA |
|---|-------------------------|--|----|
| Shipping Container(s) Intact?                                       | ✓                       |  |    |
| Shipping Custody Seals Intact?                                      | ✓                       |  |    |
| Airbill Trk # <u>4894 6696 4116</u>                                 | ✓                       |  |    |
| Shipping Documentation Present?                                     | ✓                       |  |    |
| Shipping Container <u>Vista</u> Client <u>Retain</u> Return Dispose |                         |  |    |
| Chain of Custody / Sample Documentation Present?                    | ✓                       |  |    |
| Chain of Custody / Sample Documentation Complete?                   | ✓                       |  |    |
| Holding Time Acceptable?  | ✓                       |  |    |
| Logged In: Date/Time<br><u>01/21/20 1024</u>                        | Initials:<br><u>MWS</u> | Location: R-13, WR-2<br>↓<br>Shelf/Rack: <u>2-2, E-4</u> |    |
| COC Anomaly/Sample Acceptance Form completed?                       |                         | ✓  | ✓  |

Comments:

# CoC/Label Reconciliation Report WO# 2000118

| LabNumber  | CoC Sample ID        |                                     | Sample Alias  | Sample Date/Time | Container                           | Sample BaseMatrix   | Comments |
|------------|----------------------|-------------------------------------|---------------|------------------|-------------------------------------|---------------------|----------|
| 2000118-01 | A GW2001131025RAP    | <input checked="" type="checkbox"/> | DT01-MW1S     | 13-Jan-20 10:25  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-01 | B GW2001131025RAP    | <input checked="" type="checkbox"/> | DT01-MW1S (A) | 13-Jan-20 10:25  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-02 | A GW2001131155RAP    | <input checked="" type="checkbox"/> | DT01-MW1D     | 13-Jan-20 11:55  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-02 | B GW2001131155RAP    | <input checked="" type="checkbox"/> | DT01-MW1D     | 13-Jan-20 11:55  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-03 | A GW2001131320RAP    | <input checked="" type="checkbox"/> | DT01-MW2S     | 13-Jan-20 13:20  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-03 | B GW2001131320RAP    | <input checked="" type="checkbox"/> | DT01-MW2S     | 13-Jan-20 13:20  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-04 | A GW2001131320RAP-FD | <input checked="" type="checkbox"/> | DT01-MW2S     | 13-Jan-20 13:20  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-04 | B GW2001131320RAP-FD | <input checked="" type="checkbox"/> | DT01-MW2S     | 13-Jan-20 13:20  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-05 | A GW2001131435RAP    | <input checked="" type="checkbox"/> | DT01-MW2D     | 13-Jan-20 14:35  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-05 | B GW2001131435RAP    | <input checked="" type="checkbox"/> | DT01-MW2D     | 13-Jan-20 14:35  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-06 | A GW2001131535RAP    | <input checked="" type="checkbox"/> | DT02-MW2S     | 13-Jan-20 15:35  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-06 | B GW2001131535RAP    | <input checked="" type="checkbox"/> | DT02-MW2S     | 13-Jan-20 15:35  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-07 | A GW2001131620RAP    | <input checked="" type="checkbox"/> | DT02-MW2D     | 13-Jan-20 16:20  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-07 | B GW2001131620RAP    | <input checked="" type="checkbox"/> | DT02-MW2D     | 13-Jan-20 16:20  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-08 | A GW2001141055RAP    | <input checked="" type="checkbox"/> | DT02-MW1S     | 14-Jan-20 10:55  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-08 | B GW2001141055RAP    | <input checked="" type="checkbox"/> | DT02-MW1S     | 14-Jan-20 10:55  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-09 | A GW2001141210RAP    | <input checked="" type="checkbox"/> | DT02-MW1D     | 14-Jan-20 12:10  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-09 | B GW2001141210RAP    | <input checked="" type="checkbox"/> | DT02-MW1D     | 14-Jan-20 12:10  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-10 | A GW2001141450RAP    | <input checked="" type="checkbox"/> | CA03-MW1S     | 14-Jan-20 14:50  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-10 | B GW2001141450RAP    | <input checked="" type="checkbox"/> | CA03-MW1S     | 14-Jan-20 14:50  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-11 | A GW2001141525RAP    | <input checked="" type="checkbox"/> | CA03-MW1D     | 14-Jan-20 15:25  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-11 | B GW2001141525RAP    | <input checked="" type="checkbox"/> | CA03-MW1D     | 14-Jan-20 15:25  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-12 | A GW2001161030RAP    | <input checked="" type="checkbox"/> | CA04-MW1S     | 16-Jan-20 10:30  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-12 | B GW2001161030RAP    | <input type="checkbox"/> (8)        | CA04-MW1S     | 16-Jan-20 10:30  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-13 | A GW2001161140RAP    | <input checked="" type="checkbox"/> | CA04-MW1D     | 16-Jan-20 11:40  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-13 | B GW2001161140RAP    | <input checked="" type="checkbox"/> | CA04-MW1D     | 16-Jan-20 11:40  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-14 | A GW2001161305RAP    | <input checked="" type="checkbox"/> | CA05-MW1S     | 16-Jan-20 13:05  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-14 | B GW2001161305RAP    | <input checked="" type="checkbox"/> | CA05-MW1S     | 16-Jan-20 13:05  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |
| 2000118-15 | A GW2001161400RAP    | <input checked="" type="checkbox"/> | CA05-MW1D     | 16-Jan-20 14:00  | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous  |

|            |                      |                                     |           |                 |                                     |                     |         |
|------------|----------------------|-------------------------------------|-----------|-----------------|-------------------------------------|---------------------|---------|
| 2000118-15 | B GW2001161400RAP    | <input checked="" type="checkbox"/> | CA05-MW1D | 16-Jan-20 14:00 | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous |
| 2000118-16 | A GW2001161500RAP    | <input checked="" type="checkbox"/> | CA05-MW2S | 16-Jan-20 15:00 | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous |
| 2000118-16 | B GW2001161500RAP    | <input checked="" type="checkbox"/> | CA05-MW2S | 16-Jan-20 15:00 | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous |
| 2000118-17 | A GW2001161500RAP-FD | <input checked="" type="checkbox"/> | CA05-MW2S | 16-Jan-20 15:00 | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous |
| 2000118-17 | B GW2001161500RAP-FD | <input checked="" type="checkbox"/> | CA05-MW2S | 16-Jan-20 15:00 | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous |
| 2000118-18 | A GW2001161615RAP    | <input checked="" type="checkbox"/> | CA05-MW2D | 16-Jan-20 16:15 | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous |
| 2000118-18 | B GW2001161615RAP    | <input checked="" type="checkbox"/> | CA05-MW2D | 16-Jan-20 16:15 | <input checked="" type="checkbox"/> | HDPE Bottle, 250 mL | Aqueous |

Checkmarks indicate that information on the COC reconciled with the sample label.

Any discrepancies are noted in the following columns.

|  | Yes                                 | No | NA                                  |
|--|-------------------------------------|----|-------------------------------------|
| Sample Container Intact?   | <input checked="" type="checkbox"/> |    |                                     |
| Sample Custody Seals Intact?                                       |                                     |    | <input checked="" type="checkbox"/> |
| Adequate Sample Volume?  | <input checked="" type="checkbox"/> |    |                                     |
| Container Type Appropriate for Analysis(es)                        | <input checked="" type="checkbox"/> |    |                                     |
| Preservation Documented: Na2S2O3 Trizma None Other                 |                                     |    | <input checked="" type="checkbox"/> |
| If Chlorinated or Drinking Water Samples, Acceptable Preservation? |                                     |    | <input checked="" type="checkbox"/> |

Comments:

A) Sample Alias: "DT01 - MW1D"  
 B) Sample ID: "GW2001161615030RAP"  
 Date and time reconcile. was 01/21/20

Verified by/Date:

EM / 01/21/20



## ANALYTICAL REPORT

Eurofins TestAmerica, Edison  
777 New Durham Road  
Edison, NJ 08817  
Tel: (732)549-3900

Laboratory Job ID: 460-179559-1  
Client Project/Site: Statewide WWTP Biosolids

For:

Michigan Dept of Environmental Quality  
Water Resources Division  
Constitution Hall, 3rd Fl SW  
525 W. Allegan Street  
Lansing, Michigan 48909

Attn: Stephanie Kammer



Authorized for release by:  
4/30/2019 4:04:20 PM

Kris Brooks, Project Manager II  
(330)966-9790  
[kris.brooks@testamericanainc.com](mailto:kris.brooks@testamericanainc.com)

LINKS

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The  
Expert

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[www.testamericanainc.com](http://www.testamericanainc.com)

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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# Definitions/Glossary

Client: Michigan Dept of Environmental Quality  
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

## Glossary

### Abbreviation

**These commonly used abbreviations may or may not be present in this report.**

|                |   |
|----------------|---|
| □              | Listed under the "D" column to designate that the result is reported on a dry weight basis                  |
| %R             | Percent Recovery  |
| CFL            | Contains Free Liquid  |
| CNF            | Contains No Free Liquid   |
| DER            | Duplicate Error Ratio (normalized absolute difference)  |
| Dil Fac        | Dilution Factor   |
| DL             | Detection Limit (DoD/DOE)   |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC            | Decision Level Concentration (Radiochemistry)   |
| EDL            | Estimated Detection Limit (Dioxin)  |
| LOD            | Limit of Detection (DoD/DOE)  |
| LOQ            | Limit of Quantitation (DoD/DOE)   |
| MDA            | Minimum Detectable Activity (Radiochemistry)  |
| MDC            | Minimum Detectable Concentration (Radiochemistry)   |
| MDL            | Method Detection Limit  |
| ML             | Minimum Level (Dioxin)  |
| NC             | Not Calculated  |
| ND             | Not Detected at the reporting limit (or MDL or EDL if shown)  |
| PQL            | Practical Quantitation Limit  |
| QC             | Quality Control   |
| RER            | Relative Error Ratio (Radiochemistry)   |
| RL             | Reporting Limit or Requested Limit (Radiochemistry)   |
| RPD            | Relative Percent Difference, a measure of the relative difference between two points                        |
| TEF            | Toxicity Equivalent Factor (Dioxin)   |
| TEQ            | Toxicity Equivalent Quotient (Dioxin)   |

# Case Narrative

Client: Michigan Dept of Environmental Quality  
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Job ID: 460-179559-1**

**Laboratory: Eurofins TestAmerica, Edison**

Narrative

## CASE NARRATIVE

**Client: Michigan Dept of Environmental Quality**

**Project: Statewide WWTP Biosolids**

**Report Number: 460-179559-1**

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Edison attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

### RECEIPT

The samples were received on 4/11/2019 9:13 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

### TOTAL ORGANIC CARBON

Samples SXDU11904081125RL (460-179559-1), SXDU21904081210RL (460-179559-2), SXDU31904081300RL (460-179559-3), SXDU41904081450RL (460-179559-4), SXDU11904081700RL (460-179559-5), SXDU21904081755RL (460-179559-6), SXDU11904081825RL (460-179559-7), SXDU21904081910RL (460-179559-8), SXDU11904091050MK (460-179559-9), SXDU21904091155MK (460-179559-10), SXDU21904091300MK (460-179559-11), SXDU11904091350MK (460-179559-12), SXDU11904101005RL (460-179559-13), SXDU21904101050RL (460-179559-14), SXDU31904101120RL (460-179559-15), SXDU11904101300RL (460-179559-16), SXDU21904101330RL (460-179559-17), SXDU31904101355RL (460-179559-18), SXDU21904101505RL (460-179559-19) and SXDU11904101540RL (460-179559-20) were analyzed for total organic carbon in accordance with Lloyd Kahn Method. The samples were analyzed on 04/18/2019 and 04/23/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### PERCENT SOLIDS

Samples SXDU11904081125RL (460-179559-1), SXDU21904081210RL (460-179559-2), SXDU31904081300RL (460-179559-3),

## Case Narrative

Client: Michigan Dept of Environmental Quality  
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

### Job ID: 460-179559-1 (Continued)

#### Laboratory: Eurofins TestAmerica, Edison (Continued)

SXDU41904081450RL (460-179559-4), SXDU11904081700RL (460-179559-5), SXDU21904081755RL (460-179559-6), SXDU11904081825RL (460-179559-7), SXDU21904081910RL (460-179559-8), SXDU11904091050MK (460-179559-9), SXDU21904091155MK (460-179559-10), SXDU21904091300MK (460-179559-11), SXDU11904091350MK (460-179559-12), SXDU11904101005RL (460-179559-13), SXDU21904101050RL (460-179559-14), SXDU31904101120RL (460-179559-15), SXDU11904101300RL (460-179559-16), SXDU21904101330RL (460-179559-17), SXDU31904101355RL (460-179559-18), SXDU21904101505RL (460-179559-19) and SXDU11904101540RL (460-179559-20) were analyzed for percent solids in accordance with ASTM Method D2216-80. The samples were analyzed on 04/27/2019.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Detection Summary

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU11904081125RL**

Bronson

**Lab Sample ID: 460-179559-1**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 13000  |           | 120 | 80  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU21904081210RL**

Bronson

**Lab Sample ID: 460-179559-2**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 29000  |           | 130 | 87  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU31904081300RL**

Bronson

**Lab Sample ID: 460-179559-3**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 19000  |           | 120 | 85  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU41904081450RL**

Bronson

**Lab Sample ID: 460-179559-4**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 13000  |           | 120 | 81  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU11904081700RL**

Bronson

**Lab Sample ID: 460-179559-5**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 6500   |           | 120 | 80  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU21904081755RL**

Bronson

**Lab Sample ID: 460-179559-6**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 6800   |           | 120 | 81  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU11904081825RL**

Bronson

**Lab Sample ID: 460-179559-7**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 13000  |           | 120 | 81  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU21904081910RL**

Bronson

**Lab Sample ID: 460-179559-8**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 8100   |           | 110 | 79  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU11904091050MK**

Delhi

**Lab Sample ID: 460-179559-9**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 18000  |           | 120 | 84  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU21904091155MK**

Delhi

**Lab Sample ID: 460-179559-10**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 18000  |           | 120 | 83  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU21904091300MK**

Delhi

**Lab Sample ID: 460-179559-11**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 17000  |           | 120 | 82  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

**Client Sample ID: SXDU11904091350MK**

Delhi

**Lab Sample ID: 460-179559-12**

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D | Method     | Prep Type |
|--------------|--------|-----------|-----|-----|-------|---------|---|------------|-----------|
| TOC Result 1 | 100000 |           | 140 | 95  | mg/Kg | 1       | ⊗ | Lloyd Kahn | Total/NA  |

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Edison

## Detection Summary

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

| Client Sample ID: SXDU11904101005RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-13 |            |           |  |
|-------------------------------------|--------|-----------|-----|-----|-------|---------|------------------------------|------------|-----------|--|
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 9300   |           | 120 | 79  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |
| Client Sample ID: SXDU21904101050RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-14 |            |           |  |
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 8600   |           | 120 | 79  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |
| Client Sample ID: SXDU31904101120RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-15 |            |           |  |
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 49000  |           | 130 | 89  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |
| Client Sample ID: SXDU11904101300RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-16 |            |           |  |
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 8100   |           | 120 | 84  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |
| Client Sample ID: SXDU21904101330RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-17 |            |           |  |
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 43000  |           | 130 | 88  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |
| Client Sample ID: SXDU31904101355RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-18 |            |           |  |
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 11000  |           | 110 | 78  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |
| Client Sample ID: SXDU21904101505RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-19 |            |           |  |
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 7600   |           | 120 | 79  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |
| Client Sample ID: SXDU11904101540RL |        |           |     |     |       |         | Lab Sample ID: 460-179559-20 |            |           |  |
| Analyte                             | Result | Qualifier | RL  | MDL | Unit  | Dil Fac | D                            | Method     | Prep Type |  |
| TOC Result 1                        | 10000  |           | 120 | 81  | mg/Kg | 1       | ⊗                            | Lloyd Kahn | Total/NA  |  |

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Edison

# Client Sample Results

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU11904081125RL**

**Lab Sample ID: 460-179559-1**

Matrix: Solid

Date Collected: 04/08/19 11:25  
 Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 14.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 85.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU11904081125RL**

**Lab Sample ID: 460-179559-1**

Matrix: Solid

Date Collected: 04/08/19 11:25  
 Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 13000  |           | 120 | 80  | mg/Kg |   |          | 04/18/19 14:13 | 1       |

**Client Sample ID: SXDU21904081210RL**

**Lab Sample ID: 460-179559-2**

Matrix: Solid

Date Collected: 04/08/19 12:10  
 Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 21.1   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 78.9   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU21904081210RL**

**Lab Sample ID: 460-179559-2**

Matrix: Solid

Date Collected: 04/08/19 12:10  
 Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 29000  |           | 130 | 87  | mg/Kg |   |          | 04/18/19 15:27 | 1       |

**Client Sample ID: SXDU31904081300RL**

**Lab Sample ID: 460-179559-3**

Matrix: Solid

Date Collected: 04/08/19 13:00  
 Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 19.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 80.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU31904081300RL**

**Lab Sample ID: 460-179559-3**

Matrix: Solid

Date Collected: 04/08/19 13:00  
 Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 19000  |           | 120 | 85  | mg/Kg |   |          | 04/18/19 15:36 | 1       |

**Client Sample ID: SXDU41904081450RL**

**Lab Sample ID: 460-179559-4**

Matrix: Solid

Date Collected: 04/08/19 14:50  
 Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 15.2   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

Eurofins TestAmerica, Edison

# Client Sample Results

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU41904081450RL**

**Lab Sample ID: 460-179559-4**

Date Collected: 04/08/19 14:50

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry (Continued)

| Analyte        | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|----------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Solids | 84.8   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU41904081450RL**

**Lab Sample ID: 460-179559-4**

Date Collected: 04/08/19 14:50

Matrix: Solid

Date Received: 04/11/19 09:13

Percent Solids: 84.8

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 13000  |           | 120 | 81  | mg/Kg | ⊗ |          | 04/18/19 15:44 | 1       |

**Client Sample ID: SXDU11904081700RL**

**Lab Sample ID: 460-179559-5**

Date Collected: 04/08/19 17:00

Matrix: Solid

Date Received: 04/11/19 09:13

Percent Solids: 84.8

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 14.6   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 85.4   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU11904081700RL**

**Lab Sample ID: 460-179559-5**

Date Collected: 04/08/19 17:00

Matrix: Solid

Date Received: 04/11/19 09:13

Percent Solids: 85.4

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 6500   |           | 120 | 80  | mg/Kg | ⊗ |          | 04/18/19 15:51 | 1       |

**Client Sample ID: SXDU21904081755RL**

**Lab Sample ID: 460-179559-6**

Date Collected: 04/08/19 17:55

Matrix: Solid

Date Received: 04/11/19 09:13

Percent Solids: 84.5

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 15.5   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 84.5   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU21904081755RL**

**Lab Sample ID: 460-179559-6**

Date Collected: 04/08/19 17:55

Matrix: Solid

Date Received: 04/11/19 09:13

Percent Solids: 84.5

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 6800   |           | 120 | 81  | mg/Kg | ⊗ |          | 04/18/19 16:14 | 1       |

**Client Sample ID: SXDU11904081825RL**

**Lab Sample ID: 460-179559-7**

Date Collected: 04/08/19 18:25

Matrix: Solid

Date Received: 04/11/19 09:13

Percent Solids: 84.5

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 15.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 84.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

Eurofins TestAmerica, Edison

# Client Sample Results

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU11904081825RL**  
 Date Collected: 04/08/19 18:25  
 Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-7**  
 Matrix: Solid  
 Percent Solids: 84.3

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 13000  |           | 120 | 81  | mg/Kg | ⊗ |          | 04/18/19 16:22 | 1       |

**Client Sample ID: SXDU21904081910RL**  
 Date Collected: 04/08/19 19:10  
 Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-8**  
 Matrix: Solid

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 13.0   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 87.0   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU21904081910RL**  
 Date Collected: 04/08/19 19:10  
 Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-8**  
 Matrix: Solid  
 Percent Solids: 87.0

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 8100   |           | 110 | 79  | mg/Kg | ⊗ |          | 04/18/19 16:30 | 1       |

**Client Sample ID: SXDU11904091050MK**  
 Date Collected: 04/09/19 10:50  
 Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-9**  
 Matrix: Solid

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 18.9   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 81.1   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU11904091050MK**  
 Date Collected: 04/09/19 10:50  
 Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-9**  
 Matrix: Solid  
 Percent Solids: 81.1

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 18000  |           | 120 | 84  | mg/Kg | ⊗ |          | 04/18/19 16:37 | 1       |

**Client Sample ID: SXDU21904091155MK**  
 Date Collected: 04/09/19 11:55  
 Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-10**  
 Matrix: Solid

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 17.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 82.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU21904091155MK**  
 Date Collected: 04/09/19 11:55  
 Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-10**  
 Matrix: Solid  
 Percent Solids: 82.3

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 18000  |           | 120 | 83  | mg/Kg | ⊗ |          | 04/18/19 16:45 | 1       |

Eurofins TestAmerica, Edison

# Client Sample Results

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU21904091300MK**

**Lab Sample ID: 460-179559-11**

Date Collected: 04/09/19 13:00

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 16.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 83.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU21904091300MK**

**Lab Sample ID: 460-179559-11**

Date Collected: 04/09/19 13:00

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 17000  |           | 120 | 82  | mg/Kg |   |          | 04/18/19 16:52 | 1       |

**Client Sample ID: SXDU11904091350MK**

**Lab Sample ID: 460-179559-12**

Date Collected: 04/09/19 13:50

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 27.6   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 72.4   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU11904091350MK**

**Lab Sample ID: 460-179559-12**

Date Collected: 04/09/19 13:50

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 100000 |           | 140 | 95  | mg/Kg |   |          | 04/18/19 17:00 | 1       |

**Client Sample ID: SXDU11904101005RL**

**Lab Sample ID: 460-179559-13**

Date Collected: 04/10/19 10:05

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 13.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 86.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU11904101005RL**

**Lab Sample ID: 460-179559-13**

Date Collected: 04/10/19 10:05

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 9300   |           | 120 | 79  | mg/Kg |   |          | 04/23/19 13:09 | 1       |

**Client Sample ID: SXDU21904101050RL**

**Lab Sample ID: 460-179559-14**

Date Collected: 04/10/19 10:50

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 13.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

Eurofins TestAmerica, Edison

# Client Sample Results

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU21904101050RL**

**Lab Sample ID: 460-179559-14**

Date Collected: 04/10/19 10:50

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry (Continued)

| Analyte        | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|----------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Solids | 86.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU21904101050RL**

**Lab Sample ID: 460-179559-14**

Date Collected: 04/10/19 10:50

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 8600   |           | 120 | 79  | mg/Kg |   |          | 04/23/19 13:42 | 1       |

**Client Sample ID: SXDU31904101120RL**

**Lab Sample ID: 460-179559-15**

Date Collected: 04/10/19 11:20

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 23.2   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 76.8   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU31904101120RL**

**Lab Sample ID: 460-179559-15**

Date Collected: 04/10/19 11:20

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 49000  |           | 130 | 89  | mg/Kg |   |          | 04/23/19 13:50 | 1       |

**Client Sample ID: SXDU11904101300RL**

**Lab Sample ID: 460-179559-16**

Date Collected: 04/10/19 13:00

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 18.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 81.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

**Client Sample ID: SXDU11904101300RL**

**Lab Sample ID: 460-179559-16**

Date Collected: 04/10/19 13:00

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 8100   |           | 120 | 84  | mg/Kg |   |          | 04/23/19 13:57 | 1       |

**Client Sample ID: SXDU21904101330RL**

**Lab Sample ID: 460-179559-17**

Date Collected: 04/10/19 13:30

Matrix: Solid

Date Received: 04/11/19 09:13

## General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 22.1   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 77.9   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

Eurofins TestAmerica, Edison

# Client Sample Results

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

## **Client Sample ID: SXDU21904101330RL**

Date Collected: 04/10/19 13:30  
 Date Received: 04/11/19 09:13

## **Lab Sample ID: 460-179559-17**

Matrix: Solid

Percent Solids: 77.9

### General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 43000  |           | 130 | 88  | mg/Kg | ⊗ |          | 04/23/19 14:05 | 1       |

## **Client Sample ID: SXDU31904101355RL**

Date Collected: 04/10/19 13:55  
 Date Received: 04/11/19 09:13

## **Lab Sample ID: 460-179559-18**

Matrix: Solid

### General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 12.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 87.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

## **Client Sample ID: SXDU31904101355RL**

Date Collected: 04/10/19 13:55  
 Date Received: 04/11/19 09:13

## **Lab Sample ID: 460-179559-18**

Matrix: Solid

Percent Solids: 87.7

### General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 11000  |           | 110 | 78  | mg/Kg | ⊗ |          | 04/23/19 14:29 | 1       |

## **Client Sample ID: SXDU21904101505RL**

Date Collected: 04/10/19 15:05  
 Date Received: 04/11/19 09:13

## **Lab Sample ID: 460-179559-19**

Matrix: Solid

### General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 13.7   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 86.3   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

## **Client Sample ID: SXDU21904101505RL**

Date Collected: 04/10/19 15:05  
 Date Received: 04/11/19 09:13

## **Lab Sample ID: 460-179559-19**

Matrix: Solid

Percent Solids: 86.3

### General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 7600   |           | 120 | 79  | mg/Kg | ⊗ |          | 04/23/19 14:36 | 1       |

## **Client Sample ID: SXDU11904101540RL**

Date Collected: 04/10/19 15:40  
 Date Received: 04/11/19 09:13

## **Lab Sample ID: 460-179559-20**

Matrix: Solid

### General Chemistry

| Analyte          | Result | Qualifier | RL  | MDL | Unit | D | Prepared | Analyzed       | Dil Fac |
|------------------|--------|-----------|-----|-----|------|---|----------|----------------|---------|
| Percent Moisture | 15.0   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |
| Percent Solids   | 85.0   |           | 1.0 | 1.0 | %    |   |          | 04/27/19 05:15 | 1       |

## **Client Sample ID: SXDU11904101540RL**

Date Collected: 04/10/19 15:40  
 Date Received: 04/11/19 09:13

## **Lab Sample ID: 460-179559-20**

Matrix: Solid

Percent Solids: 85.0

### General Chemistry

| Analyte      | Result | Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------|-----------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | 10000  |           | 120 | 81  | mg/Kg | ⊗ |          | 04/23/19 14:44 | 1       |

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# QC Sample Results

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

## Method: Lloyd Kahn - Organic Carbon, Total (TOC)

**Lab Sample ID: MB 460-603657/3**

**Matrix: Solid**

**Analysis Batch: 603657**

| Analyte      | MB<br>Result | MB<br>Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------------|-----------------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | ND           |                 | 100 | 69  | mg/Kg |   |          | 04/18/19 13:51 | 1       |

**Lab Sample ID: LCSSRM 460-603657/4**

**Matrix: Solid**

**Analysis Batch: 603657**

| Analyte      | Spike<br>Added | LCSSRM<br>Result | LCSSRM<br>Qualifier | Unit  | D | %Rec. | Limits       |
|--------------|----------------|------------------|---------------------|-------|---|-------|--------------|
| TOC Result 1 | 13800          | 14200            |                     | mg/Kg |   | 102.8 | 34.9 - 192.8 |

**Lab Sample ID: MB 460-604732/3**

**Matrix: Solid**

**Analysis Batch: 604732**

| Analyte      | MB<br>Result | MB<br>Qualifier | RL  | MDL | Unit  | D | Prepared | Analyzed       | Dil Fac |
|--------------|--------------|-----------------|-----|-----|-------|---|----------|----------------|---------|
| TOC Result 1 | ND           |                 | 100 | 69  | mg/Kg |   |          | 04/23/19 12:50 | 1       |

**Lab Sample ID: LCSSRM 460-604732/4**

**Matrix: Solid**

**Analysis Batch: 604732**

| Analyte      | Spike<br>Added | LCSSRM<br>Result | LCSSRM<br>Qualifier | Unit  | D | %Rec. | Limits       |
|--------------|----------------|------------------|---------------------|-------|---|-------|--------------|
| TOC Result 1 | 13800          | 14200            |                     | mg/Kg |   | 102.9 | 34.9 - 192.8 |

## Method: Moisture - Percent Moisture

**Lab Sample ID: 460-179559-16 DU**

**Matrix: Solid**

**Analysis Batch: 605732**

| Analyte          | Sample<br>Result | Sample<br>Qualifier | DU<br>Result | DU<br>Qualifier | Unit | D | RPD | RPD | Limit |
|------------------|------------------|---------------------|--------------|-----------------|------|---|-----|-----|-------|
| Percent Moisture | 18.3             |                     | 17.8         |                 | %    |   | 2   | 2   | 20    |
| Percent Solids   | 81.7             |                     | 82.2         |                 | %    |   | 0.5 | 0.5 | 20    |

# QC Association Summary

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

## General Chemistry

### Analysis Batch: 603657

| Lab Sample ID       | Client Sample ID   | Prep Type | Matrix | Method     | Prep Batch |
|---------------------|--------------------|-----------|--------|------------|------------|
| 460-179559-1        | SXDU11904081125RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-2        | SXDU21904081210RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-3        | SXDU31904081300RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-4        | SXDU41904081450RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-5        | SXDU11904081700RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-6        | SXDU21904081755RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-7        | SXDU11904081825RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-8        | SXDU21904081910RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-9        | SXDU11904091050MK  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-10       | SXDU21904091155MK  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-11       | SXDU21904091300MK  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-12       | SXDU11904091350MK  | Total/NA  | Solid  | Lloyd Kahn |            |
| MB 460-603657/3     | Method Blank       | Total/NA  | Solid  | Lloyd Kahn |            |
| LCSSRM 460-603657/4 | Lab Control Sample | Total/NA  | Solid  | Lloyd Kahn |            |

### Analysis Batch: 604732

| Lab Sample ID       | Client Sample ID   | Prep Type | Matrix | Method     | Prep Batch |
|---------------------|--------------------|-----------|--------|------------|------------|
| 460-179559-13       | SXDU11904101005RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-14       | SXDU21904101050RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-15       | SXDU31904101120RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-16       | SXDU11904101300RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-17       | SXDU21904101330RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-18       | SXDU31904101355RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-19       | SXDU21904101505RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| 460-179559-20       | SXDU11904101540RL  | Total/NA  | Solid  | Lloyd Kahn |            |
| MB 460-604732/3     | Method Blank       | Total/NA  | Solid  | Lloyd Kahn |            |
| LCSSRM 460-604732/4 | Lab Control Sample | Total/NA  | Solid  | Lloyd Kahn |            |

### Analysis Batch: 605732

| Lab Sample ID    | Client Sample ID  | Prep Type | Matrix | Method   | Prep Batch |
|------------------|-------------------|-----------|--------|----------|------------|
| 460-179559-1     | SXDU11904081125RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-2     | SXDU21904081210RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-3     | SXDU31904081300RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-4     | SXDU41904081450RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-5     | SXDU11904081700RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-6     | SXDU21904081755RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-7     | SXDU11904081825RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-8     | SXDU21904081910RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-9     | SXDU11904091050MK | Total/NA  | Solid  | Moisture |            |
| 460-179559-10    | SXDU21904091155MK | Total/NA  | Solid  | Moisture |            |
| 460-179559-11    | SXDU21904091300MK | Total/NA  | Solid  | Moisture |            |
| 460-179559-12    | SXDU11904091350MK | Total/NA  | Solid  | Moisture |            |
| 460-179559-13    | SXDU11904101005RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-14    | SXDU21904101050RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-15    | SXDU31904101120RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-16    | SXDU11904101300RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-17    | SXDU21904101330RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-18    | SXDU31904101355RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-19    | SXDU21904101505RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-20    | SXDU11904101540RL | Total/NA  | Solid  | Moisture |            |
| 460-179559-16 DU | SXDU11904101300RL | Total/NA  | Solid  | Moisture |            |

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# Lab Chronicle

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU11904081125RL**  
**Date Collected: 04/08/19 11:25**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-1**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904081125RL**  
**Date Collected: 04/08/19 11:25**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-1**  
**Matrix: Solid**  
**Percent Solids: 85.3**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 14:13       | AJP     | TAL EDI |

**Client Sample ID: SXDU21904081210RL**  
**Date Collected: 04/08/19 12:10**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-2**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU21904081210RL**  
**Date Collected: 04/08/19 12:10**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-2**  
**Matrix: Solid**  
**Percent Solids: 78.9**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 15:27       | AJP     | TAL EDI |

**Client Sample ID: SXDU31904081300RL**  
**Date Collected: 04/08/19 13:00**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-3**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU31904081300RL**  
**Date Collected: 04/08/19 13:00**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-3**  
**Matrix: Solid**  
**Percent Solids: 80.7**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 15:36       | AJP     | TAL EDI |

**Client Sample ID: SXDU41904081450RL**  
**Date Collected: 04/08/19 14:50**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-4**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

# Lab Chronicle

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU41904081450RL**  
**Date Collected: 04/08/19 14:50**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-4**  
**Matrix: Solid**  
**Percent Solids: 84.8**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 15:44       | AJP     | TAL EDI |

**Client Sample ID: SXDU11904081700RL**  
**Date Collected: 04/08/19 17:00**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-5**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904081700RL**  
**Date Collected: 04/08/19 17:00**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-5**  
**Matrix: Solid**  
**Percent Solids: 85.4**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 15:51       | AJP     | TAL EDI |

**Client Sample ID: SXDU21904081755RL**  
**Date Collected: 04/08/19 17:55**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-6**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU21904081755RL**  
**Date Collected: 04/08/19 17:55**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-6**  
**Matrix: Solid**  
**Percent Solids: 84.5**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 16:14       | AJP     | TAL EDI |

**Client Sample ID: SXDU11904081825RL**  
**Date Collected: 04/08/19 18:25**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-7**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904081825RL**  
**Date Collected: 04/08/19 18:25**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-7**  
**Matrix: Solid**  
**Percent Solids: 84.3**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 16:22       | AJP     | TAL EDI |

# Lab Chronicle

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU21904081910RL**  
**Date Collected: 04/08/19 19:10**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-8**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU21904081910RL**  
**Date Collected: 04/08/19 19:10**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-8**  
**Matrix: Solid**  
**Percent Solids: 87.0**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 16:30       | AJP     | TAL EDI |

**Client Sample ID: SXDU11904091050MK**  
**Date Collected: 04/09/19 10:50**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-9**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904091050MK**  
**Date Collected: 04/09/19 10:50**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-9**  
**Matrix: Solid**  
**Percent Solids: 81.1**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 16:37       | AJP     | TAL EDI |

**Client Sample ID: SXDU21904091155MK**  
**Date Collected: 04/09/19 11:55**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-10**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU21904091155MK**  
**Date Collected: 04/09/19 11:55**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-10**  
**Matrix: Solid**  
**Percent Solids: 82.3**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 16:45       | AJP     | TAL EDI |

**Client Sample ID: SXDU21904091300MK**  
**Date Collected: 04/09/19 13:00**  
**Date Received: 04/11/19 09:13**

**Lab Sample ID: 460-179559-11**  
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

# Lab Chronicle

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU21904091300MK**

**Lab Sample ID: 460-179559-11**

Date Collected: 04/09/19 13:00

Matrix: Solid

Date Received: 04/11/19 09:13

Percent Solids: 83.7

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 16:52       | AJP     | TAL EDI |

**Client Sample ID: SXDU11904091350MK**

**Lab Sample ID: 460-179559-12**

Date Collected: 04/09/19 13:50

Matrix: Solid

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904091350MK**

**Lab Sample ID: 460-179559-12**

Date Collected: 04/09/19 13:50

Matrix: Solid

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 603657       | 04/18/19 17:00       | AJP     | TAL EDI |

**Client Sample ID: SXDU11904101005RL**

**Lab Sample ID: 460-179559-13**

Date Collected: 04/10/19 10:05

Matrix: Solid

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904101005RL**

**Lab Sample ID: 460-179559-13**

Date Collected: 04/10/19 10:05

Matrix: Solid

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 13:09       | AJP     | TAL EDI |

**Client Sample ID: SXDU21904101050RL**

**Lab Sample ID: 460-179559-14**

Date Collected: 04/10/19 10:50

Matrix: Solid

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU21904101050RL**

**Lab Sample ID: 460-179559-14**

Date Collected: 04/10/19 10:50

Matrix: Solid

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 13:42       | AJP     | TAL EDI |

# Lab Chronicle

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU31904101120RL**

**Lab Sample ID: 460-179559-15**

Matrix: Solid

Date Collected: 04/10/19 11:20

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU31904101120RL**

**Lab Sample ID: 460-179559-15**

Matrix: Solid

Date Collected: 04/10/19 11:20

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 13:50       | AJP     | TAL EDI |

**Client Sample ID: SXDU11904101300RL**

**Lab Sample ID: 460-179559-16**

Matrix: Solid

Date Collected: 04/10/19 13:00

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904101300RL**

**Lab Sample ID: 460-179559-16**

Matrix: Solid

Date Collected: 04/10/19 13:00

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 13:57       | AJP     | TAL EDI |

**Client Sample ID: SXDU21904101330RL**

**Lab Sample ID: 460-179559-17**

Matrix: Solid

Date Collected: 04/10/19 13:30

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU21904101330RL**

**Lab Sample ID: 460-179559-17**

Matrix: Solid

Date Collected: 04/10/19 13:30

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 14:05       | AJP     | TAL EDI |

**Client Sample ID: SXDU31904101355RL**

**Lab Sample ID: 460-179559-18**

Matrix: Solid

Date Collected: 04/10/19 13:55

Date Received: 04/11/19 09:13

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

Eurofins TestAmerica, Edison

# Lab Chronicle

Client: Michigan Dept of Environmental Quality  
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

**Client Sample ID: SXDU31904101355RL**  
Date Collected: 04/10/19 13:55  
Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-18**  
Matrix: Solid  
Percent Solids: 87.7

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 14:29       | AJP     | TAL EDI |

**Client Sample ID: SXDU21904101505RL**  
Date Collected: 04/10/19 15:05  
Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-19**  
Matrix: Solid

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU21904101505RL**  
Date Collected: 04/10/19 15:05  
Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-19**  
Matrix: Solid  
Percent Solids: 86.3

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 14:36       | AJP     | TAL EDI |

**Client Sample ID: SXDU11904101540RL**  
Date Collected: 04/10/19 15:40  
Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-20**  
Matrix: Solid

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Moisture     |     | 1               | 605732       | 04/27/19 05:15       | APV     | TAL EDI |

**Client Sample ID: SXDU11904101540RL**  
Date Collected: 04/10/19 15:40  
Date Received: 04/11/19 09:13

**Lab Sample ID: 460-179559-20**  
Matrix: Solid  
Percent Solids: 85.0

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab     |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA  | Analysis   | Lloyd Kahn   |     | 1               | 604732       | 04/23/19 14:44       | AJP     | TAL EDI |

## Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

# Accreditation/Certification Summary

Client: Michigan Dept of Environmental Quality  
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

## Laboratory: Eurofins TestAmerica, Edison

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority                         | Program       | EPA Region | Identification Number | Expiration Date |
|-----------------------------------|---------------|------------|-----------------------|-----------------|
| Connecticut                       | State Program | 1          | PH-0200               | 09-30-20        |
| DE Haz. Subst. Cleanup Act (HSCA) | State Program | 3          | N/A                   | 12-31-19        |
| New Jersey                        | NELAP         | 2          | 12028                 | 06-30-19        |
| New York                          | NELAP         | 2          | 11452                 | 04-01-20        |
| Pennsylvania                      | NELAP         | 3          | 68-00522              | 02-28-20        |
| Rhode Island                      | State Program | 1          | LAO00132              | 12-30-19        |
| USDA                              | Federal       |            | NJCA-003-08           | 05-03-21        |

## Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

| Authority             | Program       | EPA Region | Identification Number | Expiration Date |
|-----------------------|---------------|------------|-----------------------|-----------------|
| California            | State Program | 9          | 2927                  | 02-23-20        |
| Connecticut           | State Program | 1          | PH-0590               | 12-31-19        |
| Florida               | NELAP         | 4          | E87225                | 06-30-19        |
| Illinois              | NELAP         | 5          | 200004                | 07-31-19        |
| Kansas                | NELAP         | 7          | E-10336               | 04-30-19 *      |
| Kentucky (UST)        | State Program | 4          | 58                    | 02-23-20        |
| Kentucky (WW)         | State Program | 4          | 98016                 | 12-31-19        |
| Minnesota             | NELAP         | 5          | 039-999-348           | 12-31-19 *      |
| Minnesota (Petrofund) | State Program | 1          | 3506                  | 07-31-19        |
| Nevada                | State Program | 9          | OH00048               | 07-31-19        |
| New Jersey            | NELAP         | 2          | OH001                 | 06-30-19        |
| New York              | NELAP         | 2          | 10975                 | 03-31-20        |
| Ohio VAP              | State Program | 5          | CL0024                | 09-06-19        |
| Oregon                | NELAP         | 10         | 4062                  | 02-23-20        |
| Pennsylvania          | NELAP         | 3          | 68-00340              | 08-31-19 *      |
| Texas                 | NELAP         | 6          | T104704517-18-10      | 08-31-19        |
| USDA                  | Federal       |            | P330-16-00404         | 12-28-19        |
| Virginia              | NELAP         | 3          | 460175                | 09-14-19        |
| Washington            | State Program | 10         | C971                  | 01-12-20 *      |
| West Virginia DEP     | State Program | 3          | 210                   | 12-31-19        |

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Eurofins TestAmerica, Edison

## Method Summary

Client: Michigan Dept of Environmental Quality  
Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

| Method     | Method Description          | Protocol | Laboratory |
|------------|-----------------------------|----------|------------|
| Lloyd Kahn | Organic Carbon, Total (TOC) | EPA      | TAL EDI    |
| Moisture   | Percent Moisture            | EPA      | TAL EDI    |

**Protocol References:**

EPA = US Environmental Protection Agency

**Laboratory References:**

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

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## Sample Summary

Client: Michigan Dept of Environmental Quality  
 Project/Site: Statewide WWTP Biosolids

Job ID: 460-179559-1

| Lab Sample ID | Client Sample ID  | Matrix | Collected      | Received       |    |
|---------------|-------------------|--------|----------------|----------------|----|
| 460-179559-1  | SXDU11904081125RL | Solid  | 04/08/19 11:25 | 04/11/19 09:13 | 1  |
| 460-179559-2  | SXDU21904081210RL | Solid  | 04/08/19 12:10 | 04/11/19 09:13 | 2  |
| 460-179559-3  | SXDU31904081300RL | Solid  | 04/08/19 13:00 | 04/11/19 09:13 | 3  |
| 460-179559-4  | SXDU41904081450RL | Solid  | 04/08/19 14:50 | 04/11/19 09:13 | 4  |
| 460-179559-5  | SXDU11904081700RL | Solid  | 04/08/19 17:00 | 04/11/19 09:13 | 5  |
| 460-179559-6  | SXDU21904081755RL | Solid  | 04/08/19 17:55 | 04/11/19 09:13 | 6  |
| 460-179559-7  | SXDU11904081825RL | Solid  | 04/08/19 18:25 | 04/11/19 09:13 | 7  |
| 460-179559-8  | SXDU21904081910RL | Solid  | 04/08/19 19:10 | 04/11/19 09:13 | 8  |
| 460-179559-9  | SXDU11904091050MK | Solid  | 04/09/19 10:50 | 04/11/19 09:13 | 9  |
| 460-179559-10 | SXDU21904091155MK | Solid  | 04/09/19 11:55 | 04/11/19 09:13 | 10 |
| 460-179559-11 | SXDU21904091300MK | Solid  | 04/09/19 13:00 | 04/11/19 09:13 | 11 |
| 460-179559-12 | SXDU11904091350MK | Solid  | 04/09/19 13:50 | 04/11/19 09:13 | 12 |
| 460-179559-13 | SXDU11904101005RL | Solid  | 04/10/19 10:05 | 04/11/19 09:13 | 13 |
| 460-179559-14 | SXDU21904101050RL | Solid  | 04/10/19 10:50 | 04/11/19 09:13 | 14 |
| 460-179559-15 | SXDU31904101120RL | Solid  | 04/10/19 11:20 | 04/11/19 09:13 |    |
| 460-179559-16 | SXDU11904101300RL | Solid  | 04/10/19 13:00 | 04/11/19 09:13 |    |
| 460-179559-17 | SXDU21904101330RL | Solid  | 04/10/19 13:30 | 04/11/19 09:13 |    |
| 460-179559-18 | SXDU31904101355RL | Solid  | 04/10/19 13:55 | 04/11/19 09:13 |    |
| 460-179559-19 | SXDU21904101505RL | Solid  | 04/10/19 15:05 | 04/11/19 09:13 |    |
| 460-179559-20 | SXDU11904101540RL | Solid  | 04/10/19 15:40 | 04/11/19 09:13 |    |

## Chain of Custody Record

Edison, NJ 08817-2859  
phone 732-549-3900 fax 732-549-3679

DW    NPDES    RCRA    Other:

| Client Contact  |                   | Regulatory Program:     |     | Project Manager: Dorin Bogdan   |  | Site Contact: |          | Date: |  | COC No: |                              |  |
|---|-------------------|-------------------------|-----|---|--|---------------|----------|-------|--|---------|------------------------------|--|
| AECOM   | 3390 Sparks Dr SE | Tel/Fax: (616) 516-5995 |     | Analysis Turnaround Time  |  | Lab Contact:  | Carrier: |       |  |         | COCs                         |  |
| Grand Rapids, MI 49546  | (616) 516-5995    | PHONE                   | FAX | <input checked="" type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS | TAT if different from Below _____<br>2 weeks |               |          |       |  |         | Sampler:                     |  |
| (xxx) xxx-xxxx  |                   |                         |     | <input type="checkbox"/>  | 1 week                                       |               |          |       |  |         | For Lab Use Only:            |  |
| Project Name: Statewide WWTP Biosolids PFAS Evaluation  |                   |                         |     | <input type="checkbox"/>  | 2 days                                       |               |          |       |  |         | Walk-in Client:              |  |
| Site: -   |                   |                         |     | <input type="checkbox"/>  | 1 day  |               |          |       |  |         | Lab Sampling:                |  |
| P O # 60588767.01   |                   |                         |     |   |  |               |          |       |  |         | Job / SDG No.: <b>179559</b> |  |
| <b>Sample Identification</b>  |                   |                         |     |   |  |               |          |       |  |         |                              | Sample Specific Notes:   |
| SXDU11904081125RL   | 4/8/2019          | 1125                    | C   | SO  | 1  |               |          |       |  |         | TOC Analysis                 |  |
| SXDU11904081210RL   | 4/8/19            | 1210                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904081300RL   | 4/8/19            | 1300                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904081450RL   | 4/8/19            | 1450                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904081700RL   | 4/8/19            | 1700                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904081755RL   | 4/8/19            | 1755                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904081825RL   | 4/8/19            | 1825                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904081910RL   | 4/8/19            | 1910                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904091050MK   | 4/9/19            | 1050                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904091155MK   | 4/9/19            | 1155                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904091300MK   | 4/9/19            | 1300                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| SXDU11904091350MK   | 4/9/19            | 1350                    | C   | SO  | 1  |               |          |       |  |         |                              |  |
| <b>Preservation/Storage</b>   |                   |                         |     |   |  |               |          |       |  |         |                              | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)   |
|   |                   |                         |     |   |  |               |          |       |  |         |                              | <input type="checkbox"/> Return to Client <input type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for Months |
| <b>Special Instructions/QC Requirements &amp; Comments:</b>   |                   |                         |     |   |  |               |          |       |  |         |                              | <b>1.1°C 1R#9</b>  |
| <p><b>Possible Hazard Identification:</b><br/>Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.</p> <p><input type="checkbox"/> Non-Hazard   <input type="checkbox"/> Flammable   <input type="checkbox"/> Skin Irritant   <input type="checkbox"/> Poison B   <input type="checkbox"/> Unknown</p> |                   |                         |     |   |  |               |          |       |  |         |                              |  |
| <p><b>Relinquished by:</b> <b>Michael Kucic</b> <i>[Signature]</i></p> <p><b>Relinquished by:</b></p> <p><b>Relinquished by:</b></p> <p><b>Relinquished by:</b></p>   |                   |                         |     |   |  |               |          |       |  |         |                              |  |
| <p><b>Custody Seals intact:</b> <input type="checkbox"/> Yes   <input type="checkbox"/> No</p> <p><b>Custody Seal No.:</b> <b>No CS</b></p> <p><b>Received by:</b> <b>Angela Anna</b> <i>[Signature]</i></p> <p><b>Company:</b> <b>ACOR</b></p> <p><b>Date/Time:</b> <b>4/10/19 10:10</b></p> <p><b>Received by:</b> <b>Jillia FEDEX</b></p> <p><b>Company:</b></p> <p><b>Date/Time:</b></p>                        |                   |                         |     |   |  |               |          |       |  |         |                              |  |
| <p><b>Comments:</b></p> <p><b>Received in Laboratory by:</b></p> <p><b>Company:</b></p> <p><b>Date/Time:</b></p>  |                   |                         |     |   |  |               |          |       |  |         |                              |  |

Telephone 732 549 3900 fax 732 549 3679

## TestAmerica Edison Receipt Temperature and pH Log

Page \_\_\_\_\_ of \_\_\_\_\_

| Number of Coolers | IR Gun # | Cooler Temperatures |
|-------------------|----------|---------------------|
| 1                 | 1        | 100° F.             |
| 2                 | 2        | 100° F.             |
| 3                 | 3        | 100° F.             |
| 4                 | 4        | 100° F.             |
| 5                 | 5        | 100° F.             |
| 6                 | 6        | 100° F.             |
| 7                 | 7        | 100° F.             |
| 8                 | 8        | 100° F.             |
| 9                 | 9        | 100° F.             |
| 10                | 10       | 100° F.             |
| 11                | 11       | 100° F.             |
| 12                | 12       | 100° F.             |
| 13                | 13       | 100° F.             |
| 14                | 14       | 100° F.             |
| 15                | 15       | 100° F.             |
| 16                | 16       | 100° F.             |
| 17                | 17       | 100° F.             |
| 18                | 18       | 100° F.             |
| 19                | 19       | 100° F.             |
| 20                | 20       | 100° F.             |
| 21                | 21       | 100° F.             |
| 22                | 22       | 100° F.             |
| 23                | 23       | 100° F.             |
| 24                | 24       | 100° F.             |
| 25                | 25       | 100° F.             |
| 26                | 26       | 100° F.             |
| 27                | 27       | 100° F.             |
| 28                | 28       | 100° F.             |
| 29                | 29       | 100° F.             |
| 30                | 30       | 100° F.             |
| 31                | 31       | 100° F.             |
| 32                | 32       | 100° F.             |
| 33                | 33       | 100° F.             |
| 34                | 34       | 100° F.             |
| 35                | 35       | 100° F.             |
| 36                | 36       | 100° F.             |
| 37                | 37       | 100° F.             |
| 38                | 38       | 100° F.             |
| 39                | 39       | 100° F.             |
| 40                | 40       | 100° F.             |
| 41                | 41       | 100° F.             |
| 42                | 42       | 100° F.             |
| 43                | 43       | 100° F.             |
| 44                | 44       | 100° F.             |
| 45                | 45       | 100° F.             |
| 46                | 46       | 100° F.             |
| 47                | 47       | 100° F.             |
| 48                | 48       | 100° F.             |
| 49                | 49       | 100° F.             |
| 50                | 50       | 100° F.             |
| 51                | 51       | 100° F.             |
| 52                | 52       | 100° F.             |
| 53                | 53       | 100° F.             |
| 54                | 54       | 100° F.             |
| 55                | 55       | 100° F.             |
| 56                | 56       | 100° F.             |
| 57                | 57       | 100° F.             |
| 58                | 58       | 100° F.             |
| 59                | 59       | 100° F.             |
| 60                | 60       | 100° F.             |
| 61                | 61       | 100° F.             |
| 62                | 62       | 100° F.             |
| 63                | 63       | 100° F.             |
| 64                | 64       | 100° F.             |
| 65                | 65       | 100° F.             |
| 66                | 66       | 100° F.             |
| 67                | 67       | 100° F.             |
| 68                | 68       | 100° F.             |
| 69                | 69       | 100° F.             |
| 70                | 70       | 100° F.             |
| 71                | 71       | 100° F.             |
| 72                | 72       | 100° F.             |
| 73                | 73       | 100° F.             |
| 74                | 74       | 100° F.             |
| 75                | 75       | 100° F.             |
| 76                | 76       | 100° F.             |
| 77                | 77       | 100° F.             |
| 78                | 78       | 100° F.             |
| 79                | 79       | 100° F.             |
| 80                | 80       | 100° F.             |
| 81                | 81       | 100° F.             |
| 82                | 82       | 100° F.             |
| 83                | 83       | 100° F.             |
| 84                | 84       | 100° F.             |
| 85                | 85       | 100° F.             |
| 86                | 86       | 100° F.             |
| 87                | 87       | 100° F.             |
| 88                | 88       | 100° F.             |
| 89                | 89       | 100° F.             |
| 90                | 90       | 100° F.             |
| 91                | 91       | 100° F.             |
| 92                | 92       | 100° F.             |
| 93                | 93       | 100° F.             |
| 94                | 94       | 100° F.             |
| 95                | 95       | 100° F.             |
| 96                | 96       | 100° F.             |
| 97                | 97       | 100° F.             |
| 98                | 98       | 100° F.             |
| 99                | 99       | 100° F.             |
| 100               | 100      | 100° F.             |

If pH adjustments are required record the information below:

Sample No(s). adjusted:

Preservative Name/Concen-

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Expiration Date:

The appropriate Project Manager and Department Manager should be notified about the samples which were not adjusted.

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all samples for metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.

EDS\W-038 Rev 1 06/08/2011

## Login Sample Receipt Checklist

Client: Michigan Dept of Environmental Quality

Job Number: 460-179559-1

**Login Number:** 179559

**List Source:** Eurofins TestAmerica, Edison

**List Number:** 1

**Creator:** Rivera, Kenneth

| Question   | Answer | Comment |
|--|--------|---------|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A    |         |
| The cooler's custody seal, if present, is intact.                                | True   |         |
| Sample custody seals, if present, are intact.                                    | True   |         |
| The cooler or samples do not appear to have been compromised or tampered with.   | True   |         |
| Samples were received on ice.  | True   |         |
| Cooler Temperature is acceptable.  | True   |         |
| Cooler Temperature is recorded.  | True   |         |
| COC is present.  | True   |         |
| COC is filled out in ink and legible.  | True   |         |
| COC is filled out with all pertinent information.                                | True   |         |
| Is the Field Sampler's name present on COC?                                      | True   |         |
| There are no discrepancies between the containers received and the COC.          | True   |         |
| Samples are received within Holding Time (excluding tests with immediate HTs)    | True   |         |
| Sample containers have legible labels.   | True   |         |
| Containers are not broken or leaking.  | True   |         |
| Sample collection date/times are provided.                                       | True   |         |
| Appropriate sample containers are used.  | True   |         |
| Sample bottles are completely filled.  | True   |         |
| Sample Preservation Verified.  | True   |         |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True   |         |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").  | True   |         |
| Multiphasic samples are not present.   | True   |         |
| Samples do not require splitting or compositing.                                 | True   |         |
| Residual Chlorine Checked.   | N/A    |         |



## About AECOM

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