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Evaluation of Lapeer WWTP Biosolids Site 08n10e33-CL01

Lapeer County, MI

Project number: 60570635

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1. Introduction

This technical memorandum summarizes and reports the findings at the City of Lapeer, Michigan owned site 08n10e33-CL01 (Site) (**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 City of Lapeer Wastewater Treatment Plant (WWTP) in the soil, groundwater and adjacent surface water bodies.

The field investigation activities were designed to characterize conditions in soil, groundwater and surface water, and to collect data to evaluate risk to human health and the environment from the application of 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

The Site (**Figure 1**) is a leased actively farmed field where corn was planted for ethanol production in the 2018 growing season. As a result of the farming activities, all soil sampling and well installation was completed prior to spring planting. The investigation was conducted by AECOM on behalf of the Michigan Department of Environmental Quality (MDEQ) and was performed in accordance with applicable AECOM, MDEQ, and US Environmental Protection Agency (USEPA) guidance documents, including the site-specific Sampling and Analysis Plan (SAP) and the Quality Assurance Project Plan (QAPP).

PFAS have been classified by the USEPA as an emerging contaminant, that are regulated by the MDEQ 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 3,000 man-made fluorinated organic chemicals. Due to their unique chemical properties, PFAS have been used in many industries and consumer products since the late 1950's. The Interstate Technology Regulatory Council (ITRC) has identified four major sources of PFAS: fire training/fire response sites, industrial sites, landfills, and wastewater treatment plants/biosolids.

Preliminary surface water and fish tissue sampling performed by the MDEQ in 2013 and 2014 on the Flint River found concentrations of perfluorooctane sulfonic acid (PFOS) above Michigan's Part 31 Water Quality Standard and Michigan Department of Health and Human Services (MDHHS) screening values for fish tissue. As a result, in 2015, MDHHS released an updated "Eat Safe Fish" guidance where PFOS was the driver for the fish consumption advisory for several species on the Flint River downstream of Mott Dam. Subsequent surface water and fish collection was conducted in 2016 to investigate the potential sources of PFAS to the river the results of which indicated that there was a PFAS source located upstream of Holloway Dam. In 2017, additional monitoring was conducted upstream of Holloway Dam, of major tributaries of the Flint River, and of the three major wastewater treatment plants which discharge to the Flint River within the area of concern. Analysis of the City of Lapeer's WWTP effluent identified the WWTP as a significant source of PFOS to the Flint River in May of 2017. Subsequently, an industrial user to the WWTP was identified as contributing significant amounts of PFOS to the City's sewer system.

The City of Lapeer was authorized to land-apply biosolids from the Lapeer WWTP in accordance with a Residuals Management Program approved by the MDEQ on October 17, 2000. During land application, biosolids are injected below the surface to a maximum depth of 12 inches. Due to the elevated levels of PFAS identified in the effluent from the WWTP and concerns regarding the potential for PFAS-impacted biosolids being land applied, the MDEQ requested the City of Lapeer analyze their biosolids for PFAS on

August 24, 2017. Results indicated that PFAS was present in biosolids at elevated concentrations. The concentration of PFOS was found to be the highest at 2,100 nanograms per gram (ng/g) or parts per billion (ppb). In order to evaluate the potential impact of PFAS-contaminated biosolids in fields where they were land applied by the City of Lapeer, the MDEQ conducted a file review and identified 38 fields used by the City of Lapeer for land application of biosolids since 1997. Access to records of land application prior to 1997 is limited.

The MDEQ conducted an initial, limited investigation in December 2017 at the Site owned by the City of Lapeer (8n10e33-CL01) that included three surface soil samples and one surface water sample (**Figure 2)**. Approximately 1,423 dry tons of biosolids were applied to this field since 1999 with the last application occurring in approximately 2014. **Table 1** summarizes the application data based on a summary of the biosolids applications report provided by the MDEQ. During that time, the Site had repeated biosolids land applications which were generally applied to the 50 acres approved for application.

The results of the initial MDEQ investigation indicated the highest PFAS concentration was PFOS, with an average soil concentration of 500 ppb, which is below the proposed Part 201 residential direct contact PFAS soil criteria of 2,100 ppb. In addition, PFOS levels in the pond located on the northeast side of the field were reported at 2,000 nanograms per liter (ng/L) or parts per trillion (ppt) which is above the Part 31 water quality value of 12 ppt. The presence of elevated levels of PFOS in the soils and pond water indicated the potential for PFOS to be present in adjacent groundwater and/or surface waters. The MDEQ's drinking water cleanup criteria under Part 201 is 70 ng/L for PFOS, perfluorooctanoic acid (PFOA), or the sum of both compounds.

Analytical results of the initial MDEQ investigation are summarized in **Table 2** and laboratory reports are included in **Appendix A**.

From May 1, 2018 through May 10, 2018, AECOM conducted a field investigation to determine the impact, if any, from the land application of potential PFAS-impacted biosolids from the WWTP in the soil, groundwater and adjacent surface water bodies at the Sites. In addition, the MDEQ is sampling all of the State's public water supplies, including Lapeer County, for PFAS.

3. Hydrogeology/Geology

The geology and topography of the site is the result of glacial activity. The glacial aquifers consist of sand and gravel that are part of a thick sequence of Pleistocene glacial deposits. 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, underlain by 15 to 30 feet of lean clay with silty sand below the clay. Soil boring logs are provided in **Appendix B**.

The Lapeer County Soil Survey identified two primary types of surface soils in the three Decision Units (DUs) in which soil samples were collected. The surface soils are described by the U.S. Department of Agriculture as the Del Rey silt loam (DrA and DrB) and the Lenawee silty clay loam (Le). Both are located on lake plains, have excessive wetness and poor tilth, with Lenawee soils staying wet longer than the adjacent Del Rey soil. The Site soils identified in the Lapeer County Soil Survey are shown on **Figure 3** and are described in **Appendix C**.

Regional groundwater flow is expected to generally be towards surface water bodies such as ponds and streams. The general groundwater elevation map, based on MDEQ-provided shallow groundwater elevation data, is provided in **Figure 4** and indicates groundwater flow at the Site is to the northwest. The figure also shows that the primary groundwater discharge point is the South Branch of the Flint River, located along the western Site boundary. Site-specific groundwater elevation measurements, discussed in *Section 6*, also confirm the northwest flow direction.

4. Scope of Work

Soil, groundwater and surface water samples were collected from the Site to further characterize PFAS impact identified in the initial MDEQ investigation. Three surface soil samples were collected from each of the three DUs using Incremental Sampling Methodology (ISM). A total of nine soil samples were sent for laboratory analysis. Groundwater was collected from four monitoring wells and two temporary wells installed at the Site. The Scope of Work called for the collection of five surface water samples and three drain tile water samples; however, the drain tiles could not be physically located so surface water samples were collected from their approximate locations based on MDEQ-provided global positioning system (GPS) coordinates and other evidence, such as disturbance of the surface water (e.g. ripples), that suggested flow from the tiles into the surface water.

The soil, groundwater, and surface water samples were submitted to Vista Analytical Laboratories and analyzed using the isotope dilution method for a list of 24 PFAS which included:

- PFBA = Perfluorobutanoic acid
- PFPeA = Perfluoropentanoic acid
- PFHxA = Perfluorohexaonic acid
- PFHpA = Perfluoroheptanoic acid
- PFOA = Perfluorooctanoic acid
- PFNA = Perfluorononanoic acid
- PFDA = Perfluorodecanoic acid
- PFUnDA = Perfluoroundecanoic acid
- PFDoDA = perfluorododecanoic acid
- PFTeDA = Perfluorotetradecanoic acid
- PFTrDA = Perfluorotridecanoic acid
- PFBS = Perfluorobutane sulfonic acid
- PFPeS = Perfluoropentane sulfonic acid
- PFHxS = Perfluorohexane sulfonic acid
- PFHpS = Perfluoroheptane sulfonic acid
- PFOS = Perfluorooctane sulfonic acid
- PFNS = Perfluorononane sulfonic acid
- PFDS = Perfluorodecane sulfonic acid
- 4:2 FTS = 4:2 fluorotelomer sulfonate
- 6:2 FTS = 6:2 fluorotelomer sulfonate
- 8:2 FTS = 8:2 fluorotelomer suflonate PFOSA = Perfluorooctane sulfonamide
- EtFOSAA = N-Ethyl perfluorooctane sulfonamide
- MeFOSAA = N-methylperfluoro-1-octane sulfonamide

The nine soil samples were also submitted to Test America Laboratories for total organic carbon (TOC) analysis using the Lloyd Kahn Method.

5. Surface Soil

Surface soil samples were collected on May 1st and 2nd, 2018 in accordance with the MDEQ's Incremental Sampling Methodology and Applications guidance document. This document is based on the ITRC 2012 Incremental Sampling Methodology. The spreading of the biosolids was assumed to have been applied consistently at a depth of 8 inches across the Site based on information provided by the MDEQ. The various soil types identified in the soil survey could influence the adsorption of PFAS. In order for the sampling to be representative of the entire site, the soil samples were taken from areas with various soil types as described in *Section 3* that covered at least 50% of the entire Site. A total of three DU areas of one acre each was selected, and a total of three soil samples were collected from each DU in accordance with the MDEQ's Incremental Sampling Methodology and Applications guidance document (**Figure 3**). A total of 50 incremental sampling points were collected for each soil sample (approximately 24 grams each), resulting in a total sample mass of approximately 1,200 grams.

The location of DU2 was moved to a dryer area located approximately 100 feet to the southeast of the original proposed location due to seasonal flooding.

A one-inch diameter soil coring tool was used and was advanced to 8 inches below the ground surface (bgs), with the bottom two inches collected for composite sampling. Initial recovery with the soil coring tool was poor due to refusal as a result of hard, dry, clayey soil or gravelly conditions. Field procedures were adjusted and a spear head spade was used to remove the first 6 inches of surface soil. This allowed the soil coring tool to advance from 6 to 8 inches. This technique improved the accuracy of depth, quantity collected and time needed to complete sampling.

The PFAS data are summarized in the table below and attached **Table 3, Figure 5** and **Figure 6**.

Soil Sample IDs	Total PFAS Mean Value (ng/g)	PFOA Mean Value (ng/g)	PFOS Mean Value (ng/g)
CL01-DU1	95.0	0.9	86.2
CL01-DU2	144.8	1.5	135.3
CL01-DU3	155.8	1.5	144.7

All nine soil samples collected from the three DUs exceeded the Part 201 groundwater surface water interface (GSI) protection criteria and the proposed drinking water protection criteria for PFOS.

The areas of highest PFAS soil impact are located in DU2 and DU3. These DUs are associated with the Lenawee silty clay loam (Le) and Del Rey silt loam (DrA and DrB), respectively. The December 2017 soil samples collected by the MDEQ were also collected from the Del Rey silt loam (DrA) where the mean PFOS concentration was significantly higher (500 ng/g).

The TOC analytical results ranged from 13,000 to 23,000 milligrams per kilogram (mg/Kg) or parts per million with average TOC values for DU1, DU2 and DU3 of 15,000 mg/Kg, 21,000 mg/Kg and 15,333 mg/Kg, respectively. The maximum TOC values are associated with DU2 and the Lenawee silty clay loam (Le). **Table 4** summarizes the TOC data by DU sample and compares it to total PFAS concentration and soil survey classification and the soil lithology logged in the soil borings within the DUs.

6. Groundwater

Between May 3 and May 7, 2018, AECOM and Job Site Services (JSS) installed four monitoring wells (MW1, MW2, MW3 and MW4) and two temporary monitoring wells (TMW1 and TMW2) (**Figure 4; Table 5**). The scope of work proposed five monitoring wells to be installed in areas outside of the active farming

field and where data was needed withing the farm fields, temporary monitoring wells were to be installed for the purpose of collecting a groundwater sample. However, due to seasonal flooding, the original location proposed for MW4 was moved to a dryer area approximately 100 feet to the southeast of the original proposed location. The new location placed MW4 in the actively farmed field, so as not to disrupt farming, MW4 was changed to a temporary monitoring well (TMW2). Monitoring and temporary monitoring well locations are as shown on **Figure 4**.

Monitoring well MW1 location was selected to evaluate potential groundwater impact upgradient of the Site. Monitoring wells MW2 and MW3 were collocated with decision units DU2 and DU1, respectively, to evaluate potential impacts to the groundwater from the surface soils. In addition, MW2 also evaluated potential impacts to groundwater from the pond on the Site. Monitoring well MW3 also served as a downgradient boundary well that was used to evaluate potential impact to groundwater from upgradient surficial soils. Monitoring well MW4 was also selected as a downgradient boundary monitoring well to evaluate potential groundwater impact from surficial soils located in the northern part of the Site.

Temporary monitoring well TMW1 location was selected to evaluate potential groundwater impact from surface soils previously sampled by the MDEQ in December 2017 that contained elevated concentrations of PFOS (500 ppb). Temporary monitoring well TMW2 location was collocated with decision unit DU3 to evaluate potential groundwater impact from surface soils.

Prior to any intrusive work being performed, a utility clearance was conducted by MISS DIG, Michigan's one-call utility locating service. In addition, a third party, Underground Detectives of Toledo, OH, conducted a sub-surface investigation. All boring site locations were marked by AECOM and cleared by Underground Detective. No anomalies were encountered at the Site resulting in no sampling locations needing to be relocated.

Permanent Monitoring Wells

JSS completed the soil borings by hand auguring the first 5 feet bgs and then using a Geoprobe 7720DT. Both hand auguring and 3-inch dual tube system were used to continuously core soils. Cored soils were logged from the surface to the total depth. Soil boring logs are provided in **Appendix B**. Once water was encountered, a final dual tube sample was collected approximately 5 feet past the vadose zone to confirm groundwater. Once the borehole was reached total depth, hollow stem auger drilling was utilized to over drill the soil boring to approximately 4 feet below groundwater. The borings ranged in depth from 20 to 35 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, poly-vinyl 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 approximately1-foot above the screened interval. The screen was placed in the first sand layer encountered below the surficial clay. 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 bore hole. Bentonite chips were then used to seal the remaining annual space to within 3-feet of ground surface. Each monitoring well was completed at ground surface with a stickup steel protective cover set in concrete. An expandable J-plug was provided for each monitoring well.

Temporary Monitoring Wells

JSS completed the soil borings by hand auguring the first 5 feet bgs and then using a Geoprobe 7720DT. Both hand auguring and 3-inch dual tube system were used to continuously core soils. Cored soils were logged from the surface to the total depth (**Appendix B**). When water was encountered, a final dual tube sample was collected approximately 5 feet past the vadose zone to confirm groundwater. Once the borehole was at total depth, the dual tube system was removed. After the driller confirmed that the borehole did not collapse, a 1-inch diameter, Schedule 40, PVC well casing and a 5-foot long, 10-slot well screen was installed. TMW1 was installed in a clay unit with gravel at a depth of approximately 21 feet bgs. TMW2 was installed in a sand with gravel at a depth of 5.5 feet bgs. This shallow, saturated zone is likely perched groundwater.

Groundwater Sampling

Six groundwater samples were collected from the Site using a combination of permanent and temporary monitoring wells. The locations are shown on **Figure 4**. The monitoring well locations are generally located at the upgradient and downgradient edges of the parcels to provide groundwater flow information. The temporary monitoring wells are located in areas of active farming.

Prior to the collection of 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 an YSI Pro DDS water quality meter. Water quality measurements recorded during purging are summarized in **Table 6**. The analytical data are summarized in the table below and attached **Table 7, Figure 7** and **Figure 8**.

Well Sample IDs	Screen Interval (ft bgs)	Total PFAS (ng/L)	PFOS (ng/L)	PFOA (ng/L)
CL01-MW1	24-29	ND	ND	ND
CL01-MW2	29-34	8.0	4.1	0.7
CL01-MW3	24-29	3.8	2.4	ND
CL01-MW4	14-19	455.3	13.9	43.2
CL01-TMW1	18-23	15.9	15.0	0.9
CL01-TMW2	4-9	41,822.8	35,300.0	1,930.0

Part 201 Criteria were exceeded at three locations, MW4, TMW1, and TMW2 (**Table 7**). PFOS exceeded the Part 31 Water Quality Value (12 ng/L) in MW4 (13.9 ng/L), TMW1 (15 ng/L) and TMW2 (35,300 ng/L). The Part 201 Residential Drinking Water Criterion for PFOS and PFOA (70 ng/L) was also exceeded in TMW2 (37,230 ng/L).

The highest PFAS concentrations in groundwater were located in the northwest corner of the site at temporary monitoring well TMW2. It should be noted that TMW2 was screened from 4 ft to 9 ft below ground surface (bgs), likely in a perched groundwater zone. The upgradient monitoring well, MW1, was non-detect for PFAS concentrations. The well screen in MW1 was set at 24 ft to 29 ft bgs.

Based on groundwater static water levels measured in the four monitoring wells, the groundwater flow direction is to the northwest (**Figure 9, Table 8**) towards the South Branch of the Flint River. This is consistent with the regional groundwater flow direction shown in **Figure 4**.

7. Surface Water

Surface water samples were collected from eight locations (located both on and off the site). As previously discussed, three of the surface water samples were collected from approximate drain tile locations based on MDEQ-provided GPS coordinates and other evidence, such as disturbance of the surface water (e.g. ripples), that suggested flow from the tiles into the surface water. The analytical results are summarized in the table below and attached **Table 9, Figure 10** and **Figure 11**.

Surface Water Sample IDs	Total PFAS (ng/L)	PFOS (ng/L)	PFOA (ng/L)
CL01-SW1	8.5	1.0	1.1
CL01-SW2	7.3	ND	1.0
CL01-SW3	2,542.1	2,060.0	101.0
CL01-SW4	20.9	1.5	1.2
CL01-SW5	45.2	19.0	3.6
CL01-DR1	9.0	1.3	1.3
CL01-DR2	2,495.0	1,860.0	95.2
CL01-DR3	27.4	12.9	2.5

The Part 31 Water Quality Value was exceeded at four locations, SW3, SW5, DR2 and DR3 (**Table 9**) for PFOS. PFOS exceeded the Part 31 Water Quality Value (12 ng/L) in SW3 (2,060 ng/L), SW5 (19 ng/L), DR2 (1,860 ng/L) and DR3 (12.9 ng/L).

The highest concentration was collected at the onsite pond (SW3) located on the east central side of the site. The pond results correlate well with the MDEQ sample (total PFAS of 2,542.1 ng/L vs. 2,000 ng/L, respectively). The lowest concentration (SW2) was collected upgradient of the site to the southeast. Note that the drain tile location with the maximum detected PFAS concentration (DR2) Is in the vicinity of the groundwater sample location (TMW2) with the maximum detected PFAS concentration. It is likely that the shallow groundwater sampled in TMW2 discharges to the surface water near DR2.

The surface water sampling locations are described below.

SW1 was located in the South Branch of the Flint River, upstream of the Site and the City of Lapeer WWTP.

SW2 was collected upstream of the Site from the drain that runs along the northeast side of the property.

SW3 was collected from the small pond along the Site's eastern property boundary. The location was also a resample of the MDEQ's 2017 surface water sample from the pond.

SW4 was located in the South Branch of the Flint River at the Site's northwestern property boundary, downstream of the Site and downgradient of monitoring well MW4.

SW5 was collected from the drain downstream of the Site at the northeast corner of the Site.

DR1 was collected at the southwest corner of the property. Field staff were unable to locate any physical evidence of drain tile along the 10 foot high natural embankment in that area. The sample was collected from the surface of the South Branch of the Flint River where it came closest to the embankment.

DR2 had the highest concentration and was located along the northwest side of the site, south of MW4. The GPS coordinate location had no observable drain tile; however, field staff did identify a drainage swale containing surface water that drains surface runoff from the ground surface located just north of surface soil DU2 and DU3.

DR3 was collected from the drain along the northeast side of the property north of the pond. The GPS coordinate location had no observable drain tile; however, field staff did identify a drain containing surface water along the east side of the field.

8. QA/QC Results

Laboratory reports 1800898 and 1800937 (**Appendix A**) were subjected to data validation per the Lapeer WWTP Biosolids Sites QAPP. The reports were evaluated for data completeness, holding times and sample preservation, initial and continuing calibration, method and field blanks, ongoing precision and recovery, field duplicate precision, extracted internal standard recoveries, and reporting issues. All quality control acceptance limits and criteria specified in the QAPP were met or qualification of the data was not required, with the exception of some exceedances for extracted internal standard recovery which were qualified as estimated.

All results in other PFAS laboratory reports were evaluated to determine if any result values should be rejected based on major quality control problems. No results were rejected based on this evaluation.

Data validation memos are presented in **Appendix D**.

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, and
- 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 was discharged to the ground surface adjacent to where the material was generated.

10. Pathway and Receptors Evaluation

An exposure pathway includes five components: source of contamination; environmental media and transport mechanism; 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 the Site and corresponding Part 201 cleanup criteria are:

- Drinking Water criteria (DWC) (PFOA and PFOS 70 ppt), and
- Groundwater surface water interface (GSI; Part 31 Water Quality Values) (PFOA 12 ppb and PFOS 12 ppt).

Potentially complete surface water exposure pathways associated with the Site and corresponding Part 31 Water Quality Values or other criteria/screening values are:

- Ingestion of surface water incidental to recreational activities (human cancer values and non-cancer values for non-drinking water sources) (PFOA 12 ppb and PFOS 12 ppt),
- Ingestion of fish (human cancer values and non-cancer values for non-drinking water sources) (PFOA 12 ppb and PFOS 12 ppt), and
- Aquatic life exposures (aquatic chronic values (PFOA 880 ppb PFOS 140 ppb) and final acute values (PFOA 15,000 ppb and PFOS 1,600 ppb)).

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

- Direct Contact Criteria (DCC; criteria not available);
- Soil protection of groundwater for drinking water (DWPC; proposed criteria PFOS 1.4 ppb and PFOA 59 ppb);
- Soil protection for the groundwater surface water interface (GSIPC; PFOS 240 ppt and PFOA 10,000 ppb), and
- 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 river and other impacted surface waters for recreation and fishing, and
- Fish and other aquatic life.

Potential receptors associated with soil are:

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

Groundwater Evaluation

Groundwater receptors from WWTP biosolids include at least 26 private/household wells as identified within a ½-mile radius (**Figure 12**) using the MDEQ Wellogic data base. The MDEQ Wellogic database does not include all of the well records; however, a review of additional scanned well logs was also performed. Based upon the results of this investigation, there is no unacceptable risk based on the Part 201 drinking water criteria since all groundwater samples are below criteria except for the sample in the perched zone in TMW2. The City of Lapeer also provides municipal water to many of the residents adjacent to the site. All of the identified residential wells near the Site were found to be upgradient. In addition, groundwater samples collected as part of the MDEQ's Statewide Public Water Supply Sampling Program from community water supplies and public schools identified near the biosolids application sites were non-detect for PFAS.

Surface Water Evaluation

PFAS concentrations were detected in the surface water samples with four locations exceeding the Part 31 Water Quality Value for PFOS. However, no exceedances of the Part 31 final chronic and final acute values were detected. Based on the Part 31 Water Quality Value exceedances there is the potential for exposure to PFAS from ingestion of PFAS-impacted fish due to bioaccumulation of PFOS in fish tissue. A

fish advisory for several fish species is currently in place for the South Branch of the Flint River due to elevated PFOS concentrations in the fish.

Surface Soil Evaluation

On-site farm workers may encounter surface soil impacted with PFAS; however no Part 201 direct contact criteria has been established for PFOS and PFOA. All of the surface soil samples exceeded the GSI protection and the proposed DWPC for PFOS, indicating a potential of PFOS concentrations to leach into groundwater at levels that exceed the Part 31 Water Quality Value and Part 201 DWC.

PFAS has been documented to transfer to various plants. Depending on the plant type and individual PFAS, 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 will accumulate in the leaves and fruit. However, there is the possibility of exposure to PFAS via plant uptake through direct or indirect ingestion of PFAS-impacted plants. Currently there are no PFAS criteria for plants; however, a consumption advisory could be developed in the future similar to those for fish.

11. Summary and Discussion

PFAS was detected in all three surface soil samples in each of the three DUs (**Figure 5**), five of the six groundwater samples (**Figure 7**), and all eight surface water locations (**Figure 10**). The following Part 201 Criteria were exceeded:

- GSI protection criterion for PFOS in each of the nine soil samples;
- Proposed residential drinking water protection criterion for PFOS in each of the nine soil samples;
- Residential drinking water criteria for PFOS and PFOA in one groundwater sample;
- Part 31 Water Quality Value for PFOS in three groundwater samples and
- Part 31 Water Quality Values in five surface water samples.

The maximum PFAS concentration detected in groundwater is at temporary monitoring well TMW2 (41,822.8 ppt) where perched groundwater was encountered in a 1-foot thick sand lens within a clay unit at a depth of approximately 6 feet bgs. The four monitoring wells (MW1-MW4) and other temporary monitoring well (TMW1) were installed in a sand layer overlain by 15 to 30 feet of lean clay. With the exception of MW4, all of the PFOA and PFOS groundwater results were well below the Part 201 residential drinking water criteria of 70 ppt. While the PFOA and PFOS groundwater results for MW4 were also below the Part 201 Residential DWC, this higher PFOA and PFOS concentrations detected (57 ppt) may be the result of elevated PFAS concentrations in surface soils situated in the northern part of the Site that were not sampled or groundwater that has migrated to this location. The depth to the well screen in MW4 is also the shallowest (14 to 19 feet bgs) after TMW2 (4 to 9 feet bgs).

PFAS concentrations detected in groundwater are likely related to a combination of depth to groundwater and lithology at the Site. PFAS 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 DU2 and the Lenawee silty clay loam (Le) which also contained the maximum soil PFAS concentrations. These observations suggest that PFAS groundwater concentrations are expected to decrease in groundwater with depth due to the presence of silt and clay at the Site.

Figure 13 provides a general overview of biosolid application sites and the glacial geology. Note that the site discussed in this memorandum, CL01, is located on the edge of lacustrine clay and silt deposition. These soil types were confirmed during sampling at the Site. Two other sites that were investigated as part of the Lapeer WWTP biosolid application study, TG01 and SK01, are located in an area that has

been mapped as end moraines of coarse-textured till. Sand and gravel soil were generally observed at these two sites and are described in separate memoranda. A plot of TOC versus total PFAS in soil samples collected from the three sites (**Figure 14**) shows a separation on the plot of the CL01 Site, generally composed of fine-grained material, and the other two investigated sites, TG01 and SK01, which contain more coarse-grained material.

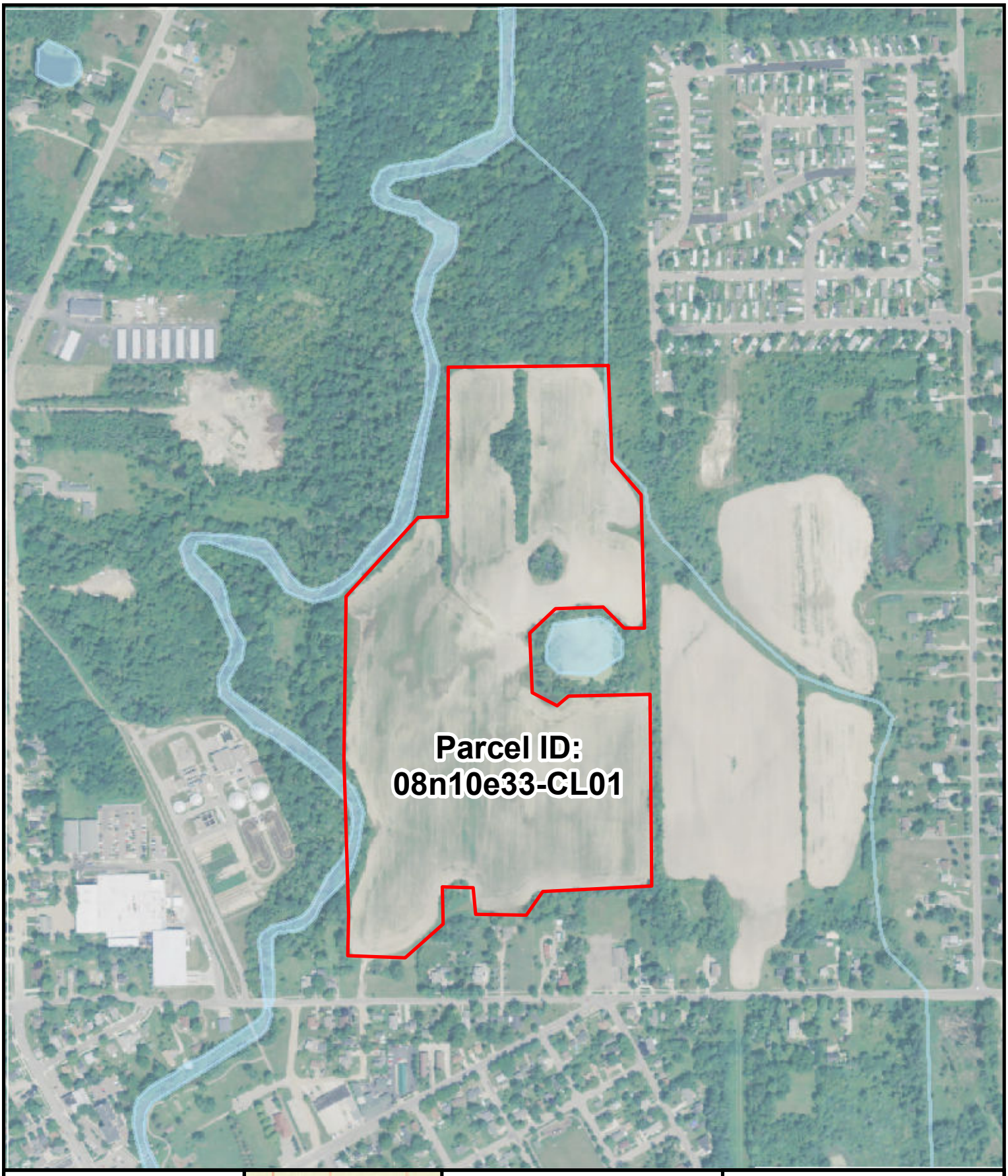
Based on the review of well records near the Site, residential wells are located immediately upgradient of the Site. The residential wells are screened at depths between 100 and 160 feet bgs with clay thickness generally in excess of 30 feet overlying the well screens. The PFAS results from monitoring and temporary well samples suggest that Part 201 DWC exceedances are limited to the shallow, perched groundwater zone. Given that the residential well locations are upgradient of the Site, the well screens are deep in the aquifer with significant overlying clay, and current groundwater sample results, there is no indication that the residential wells near the Site would be at risk of PFAS contamination. In addition, groundwater samples collected from community water supplies and public schools identified near the biosolids application sites were non-detect for PFAS.

Elevated PFAS surface water concentrations, especially the onsite pond, are likely related to a combination of surface runoff and discharge of shallow, perched groundwater into the surface water body. A potential for ingestion of PFAS-impacted fish near the Site was identified. A fish advisory for several fish species is currently in place for the South Branch of the Flint River. The surface water concentrations did not exceed the Part 31 Final Acute Value (FAV) and Final Chronic Value (FCV).

A direct contact exposure risk was not identified at the Site. However, the surface water and groundwater was found to be impacted due to PFAS leaching from the surface soils. Uptake of PFAS to various crops is also possible, but an ingestion criteria for plants has not been established. Ecological screening levels are not available for soil or sediments.

A conceptual site model was developed, as show in **Figure 15**, to illustrate the concepts presented in this memorandum. The most important observation is the relationship soil type, TOC, and groundwater depth play in the concentration of PFAS detected in the soil and groundwater.

Figures



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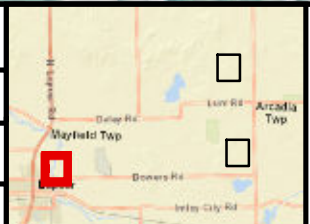
Drawn:	Date: 7/10/2018
Approved:	Date: 7/10/2018
Project #:	



Legend

- Site Location
- Surface Water

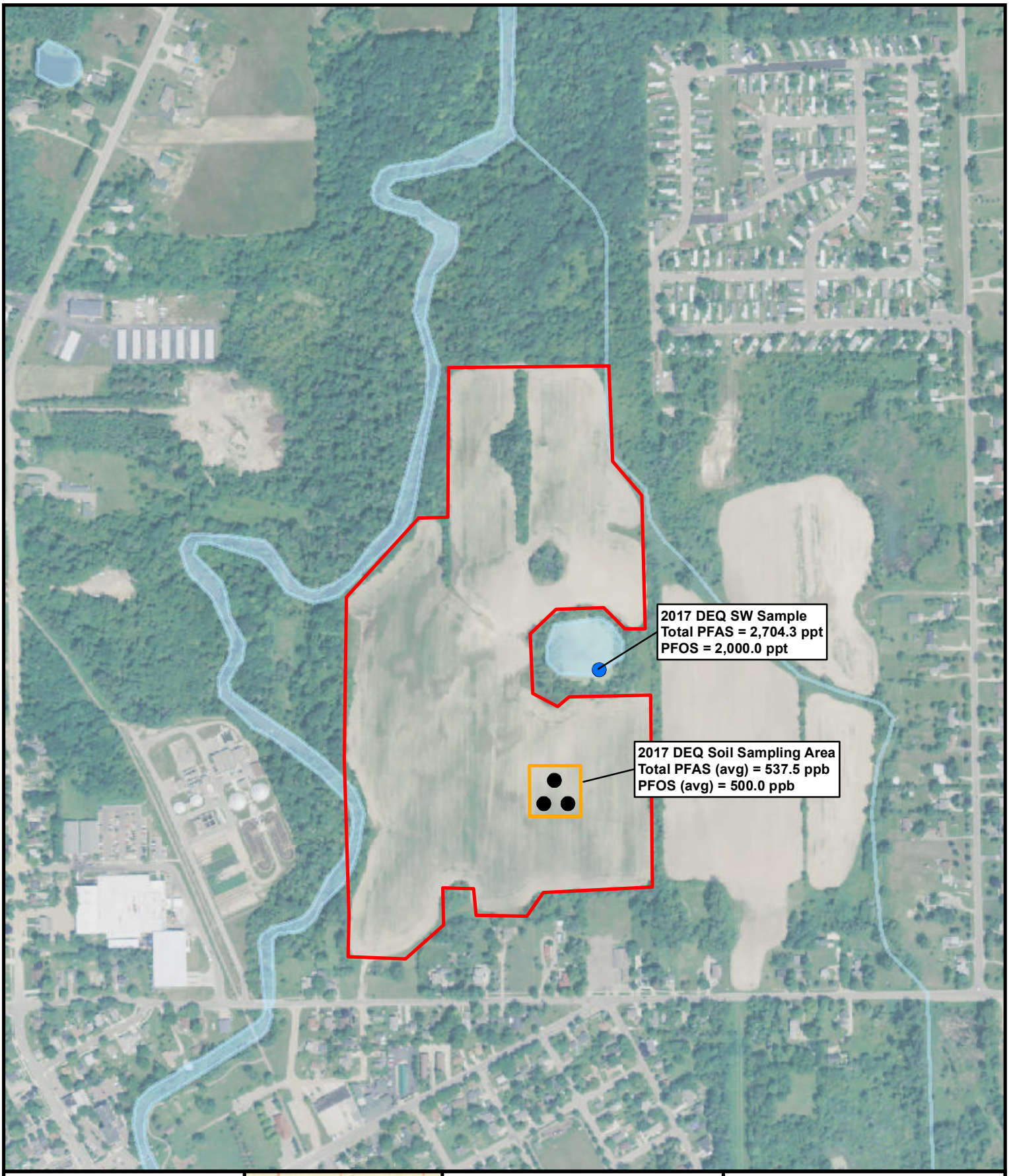
0 250 500 Feet

N

FIGURE 1
08n10e33-CL01
SITE LOCATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Figure_2_CL01_site_location.mxd



AECOM

Drawn:	Date: 7/11/2018
Approved:	Date: 7/11/2018
Project #:	

Legend

- 2017 MDEQ Soil Sample
- 2017 MDEQ Surface Water Sample
- 2017 MDEQ Soil Sampling Area
- Site Location
- Surface Water

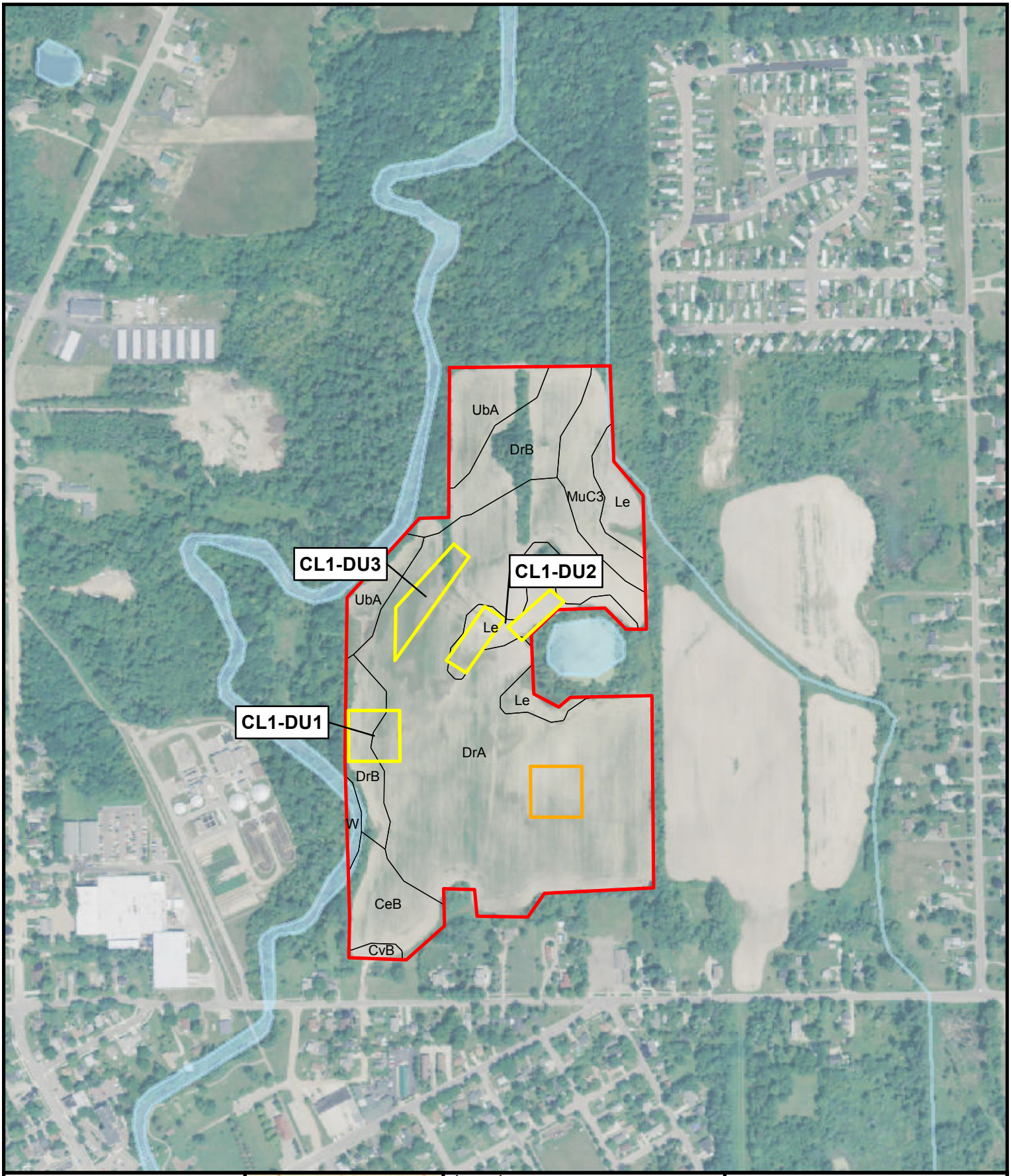
0 250 500 Feet

N

FIGURE 2
08n10e33-CL01
2017 MDEQ INVESTIGATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\2017_MDEQ_Investigation.mxd



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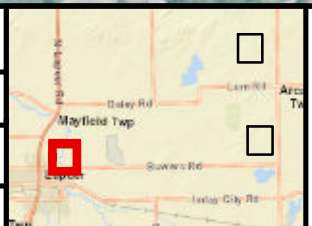
Approved:	Date: 7/11/2018
Project #:	



Legend

- Site Location
- Incremental Soil Sample Area
- 2017 MDEQ Soil Sampling Area
- Soil Series
- Surface Water

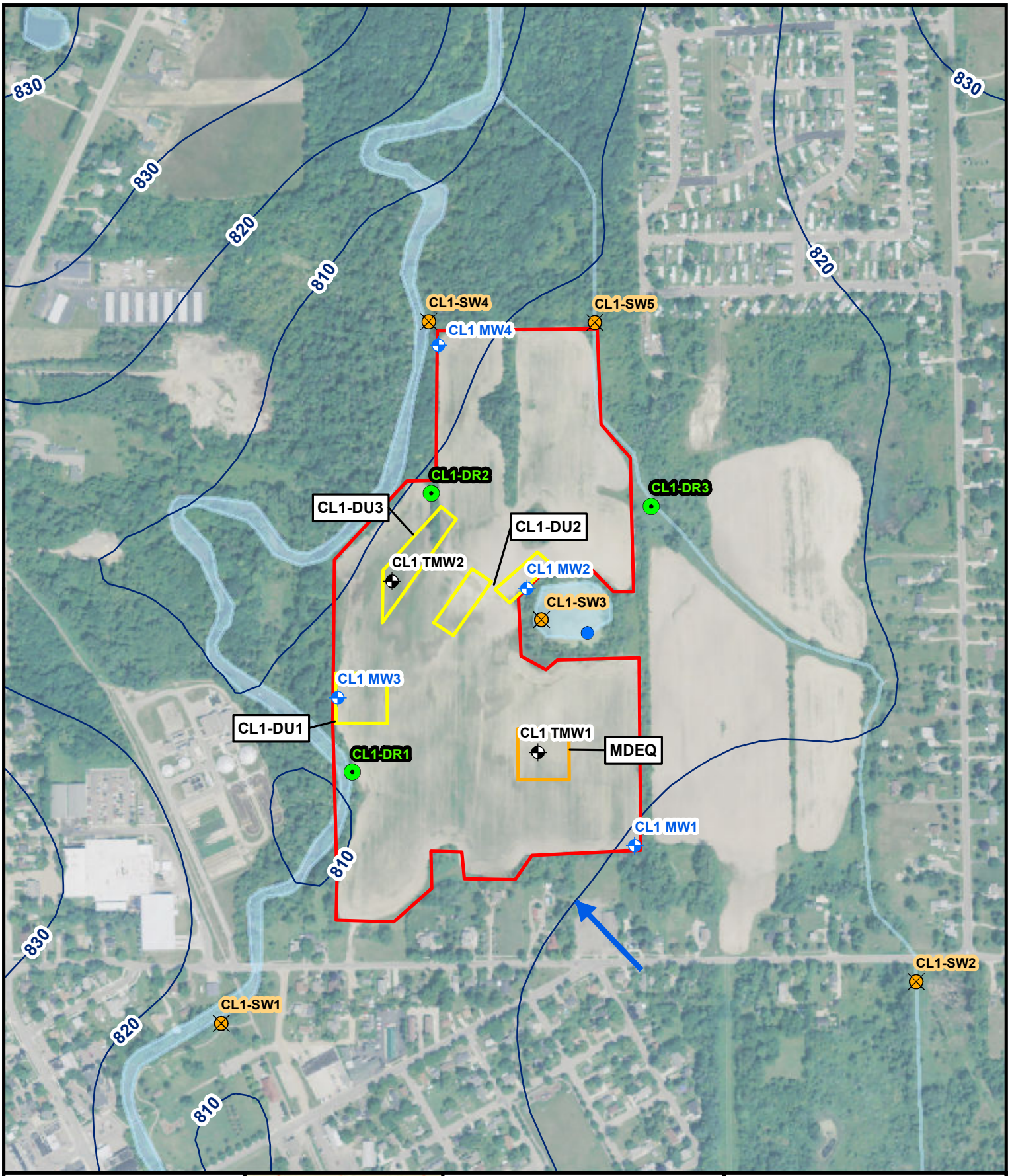
0 250 500 Feet

N

FIGURE 3
08n10e33-CL01
INCREMENTAL SOIL
SAMPLING LOCATIONS

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Incremental_soil_sampling\F3_CL01_Incremental_soil_sampling_Locations.mxd



AECOM

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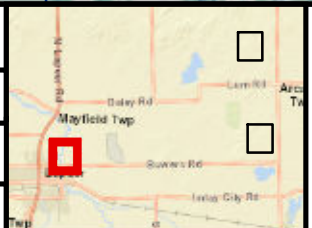
Approved:	Date: 7/12/2018
Project #:	



Legend

- Drain Sample
- Surface Water Sample
- Permanent Monitoring Well Sample
- Temporary Monitoring Well Sample
- Surface Water
- 2017 MDEQ Surface Water Sample
- Incremental Soil Sample Area
- 2017 MDEQ Soil Sampling Area
- Groundwater Contour Source: USDA GIS Portal
- Site Location
- Groundwater Flow Direction

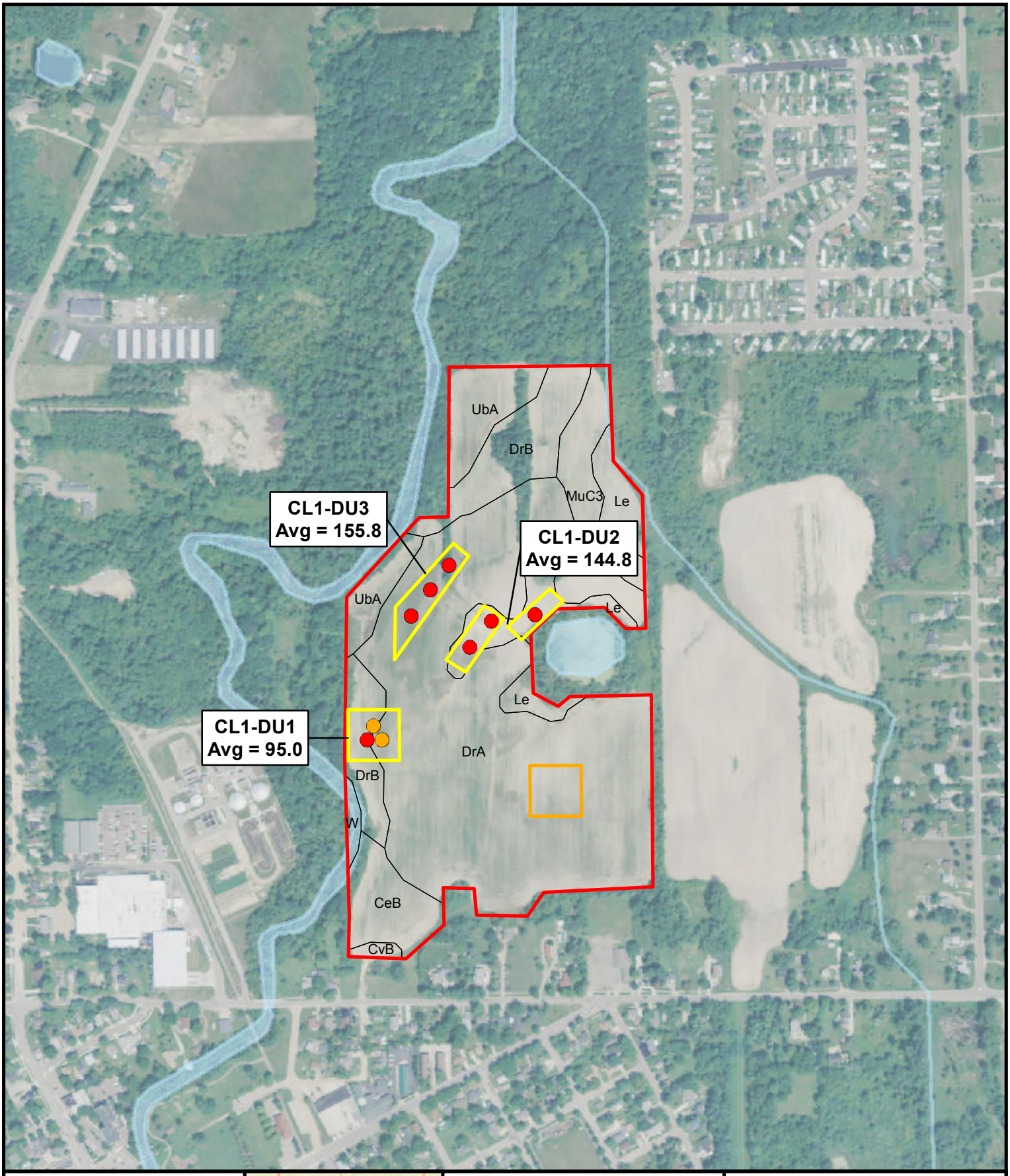
0 250 500 Feet

N

FIGURE 4
08n10e33-CL01
GROUNDWATER AND SURFACE WATER SAMPLING LOCATIONS

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Groundwater_sampling\F4_CL01_groundwater_surface_water.mxd



AECOM

Drawn:	Date: 7/11/2018
Approved:	Date: 7/11/2018
Project #:	

Sampling Results

Total PFAS (ng/g or parts per billion - ppb)

- ND
- >0 - 10
- >10 - 100
- >100 - 2100
- >2100

- Site Location
- Incremental Soil Sample Area (Average Total PFAS Concentration)
- 2017 MDEQ Soil Sampling Area
- Soil Series

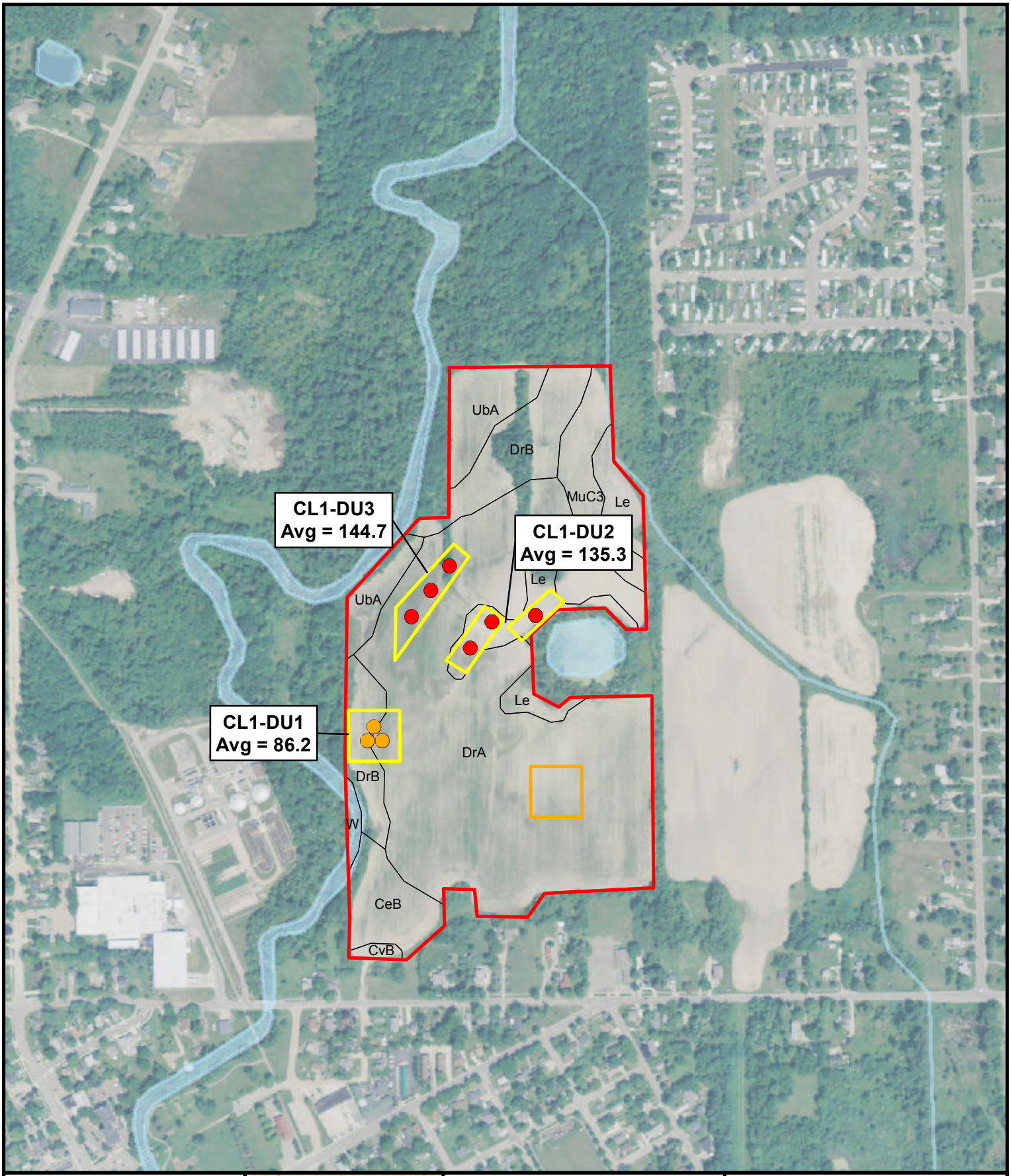
0 250 500 Feet

N

FIGURE 5
08n10e33-CL01
INCREMENTAL SOIL SAMPLING
TOTAL PFAS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\Soil\CL01_Incremental_soil_sampling_TotalPFAS_heatmap.mxd



AECOM

Drawn:	Date: 7/11/2018
Approved:	Date: 7/11/2018
Project #:	

Sampling Results

PFOS (ng/g or parts per billion - ppb)

- ND
- >0 - 10
- >10 - 100
- >100 - 2100
- >2100

- Site Location
- Incremental Soil Sample Area (Average PFOS Concentration)
- 2017 MDEQ Soil Sampling Area
- Soil Series

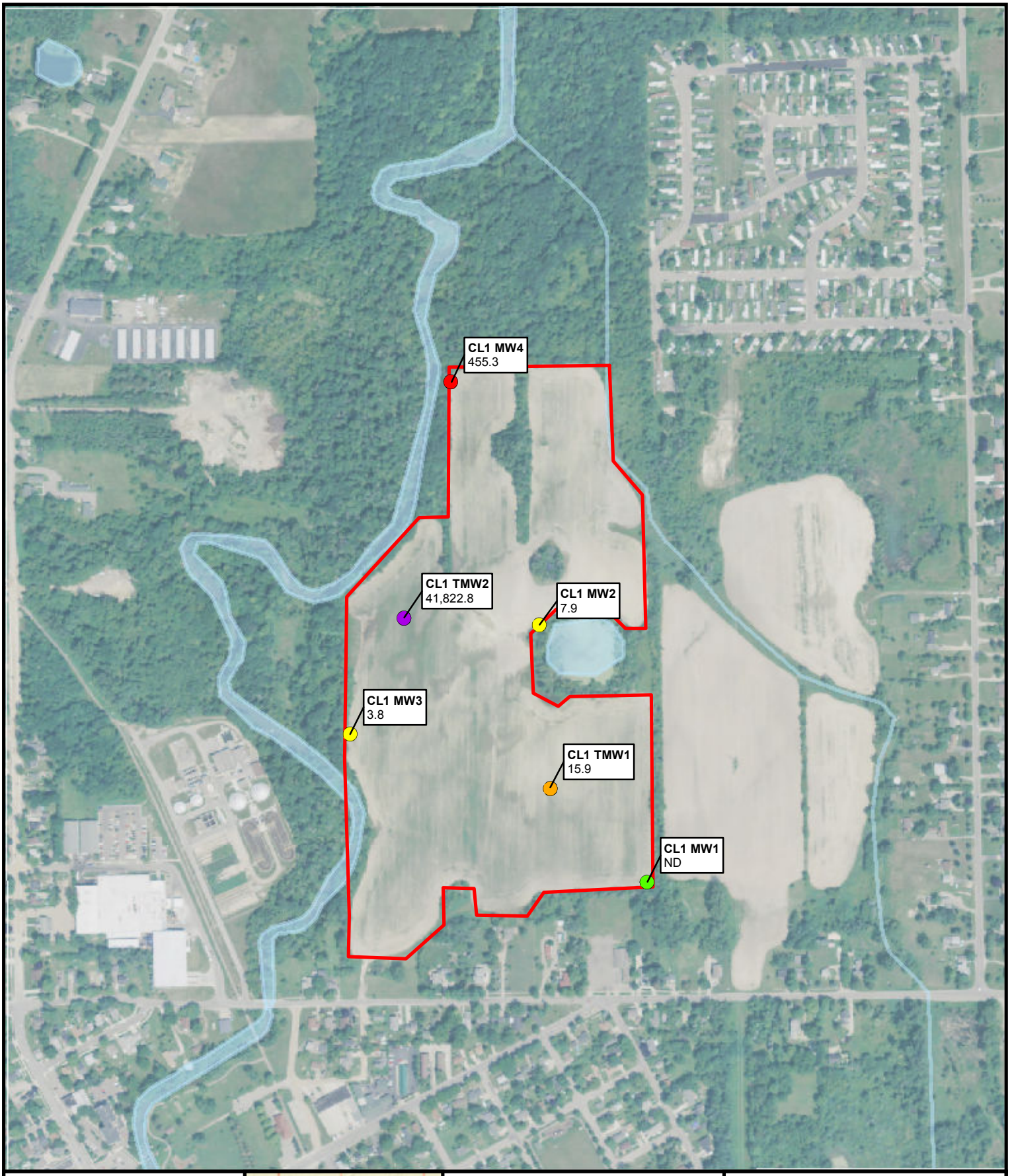
0 250 500 Feet

N

FIGURE 6
08n10e33-CL01
INCREMENTAL SOIL SAMPLING
PFOS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\Soil\CL01_F6_Incremental_soil_sampling_PFOS_heatmap.mxd



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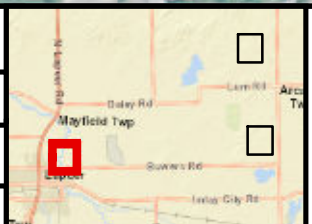
Approved:	Date: 7/11/2018
Project #:	



Sampling Results
Total PFAS (ng/L or ppt)

- ND
- >0 - 10
- >10 - 70
- >70 - 1000
- >1000

Sample Name
Total PFAS

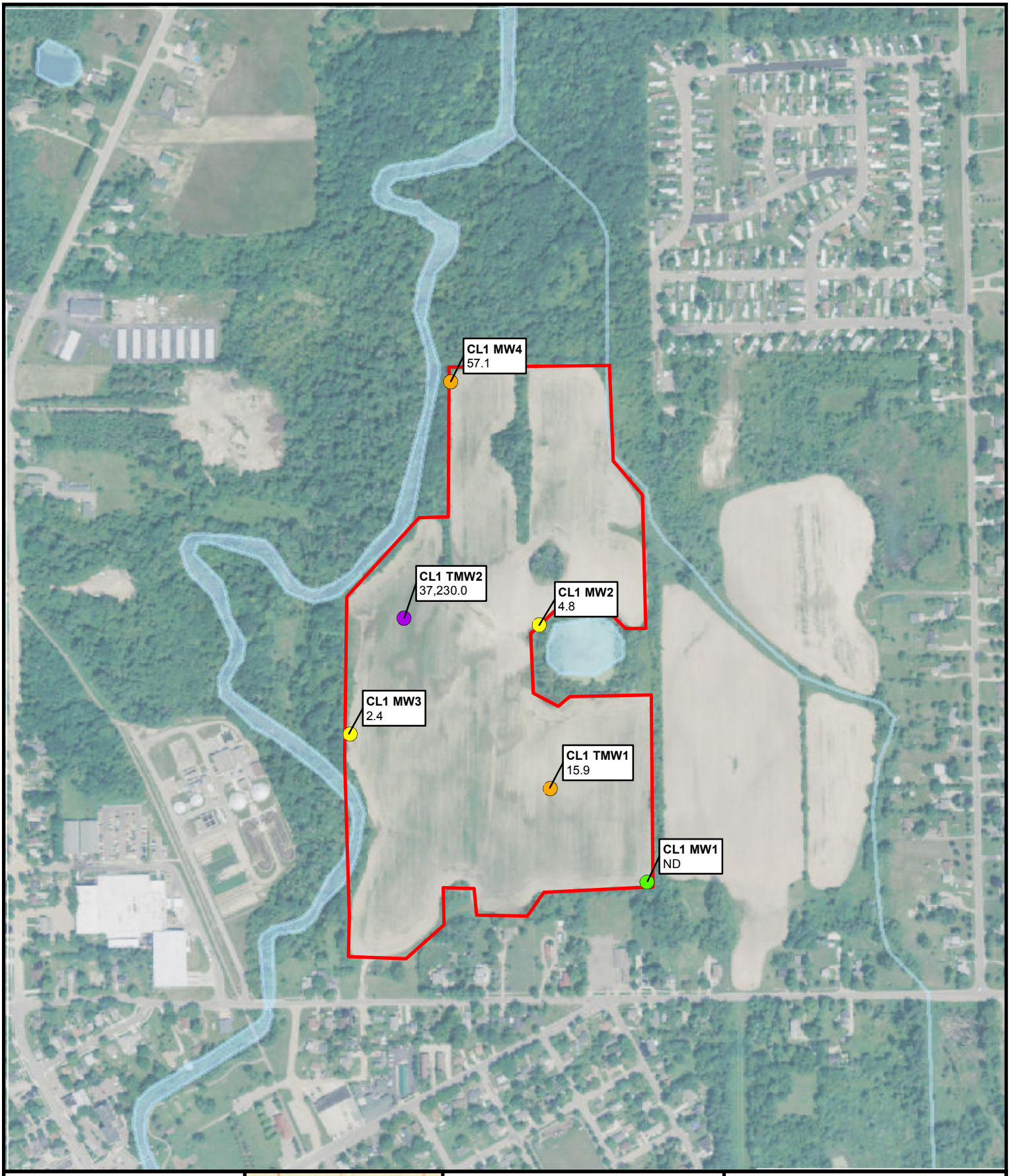
0 250 500 Feet

N

FIGURE 7
08n10e33-CL01
GROUNDWATER TOTAL PFAS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\GW\CL01_groundwater_totalPFAS_heatmap.mxd



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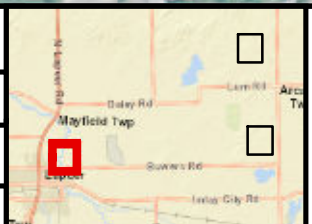
Approved:	Date: 7/12/2018
Project #:	



Sampling Results
PFOA + PFOS (ng/L or ppt)

- ND
- >0 - 10
- >10 - 70
- >70 - 1000
- >1000

Sample Name
PFOA+PFOS

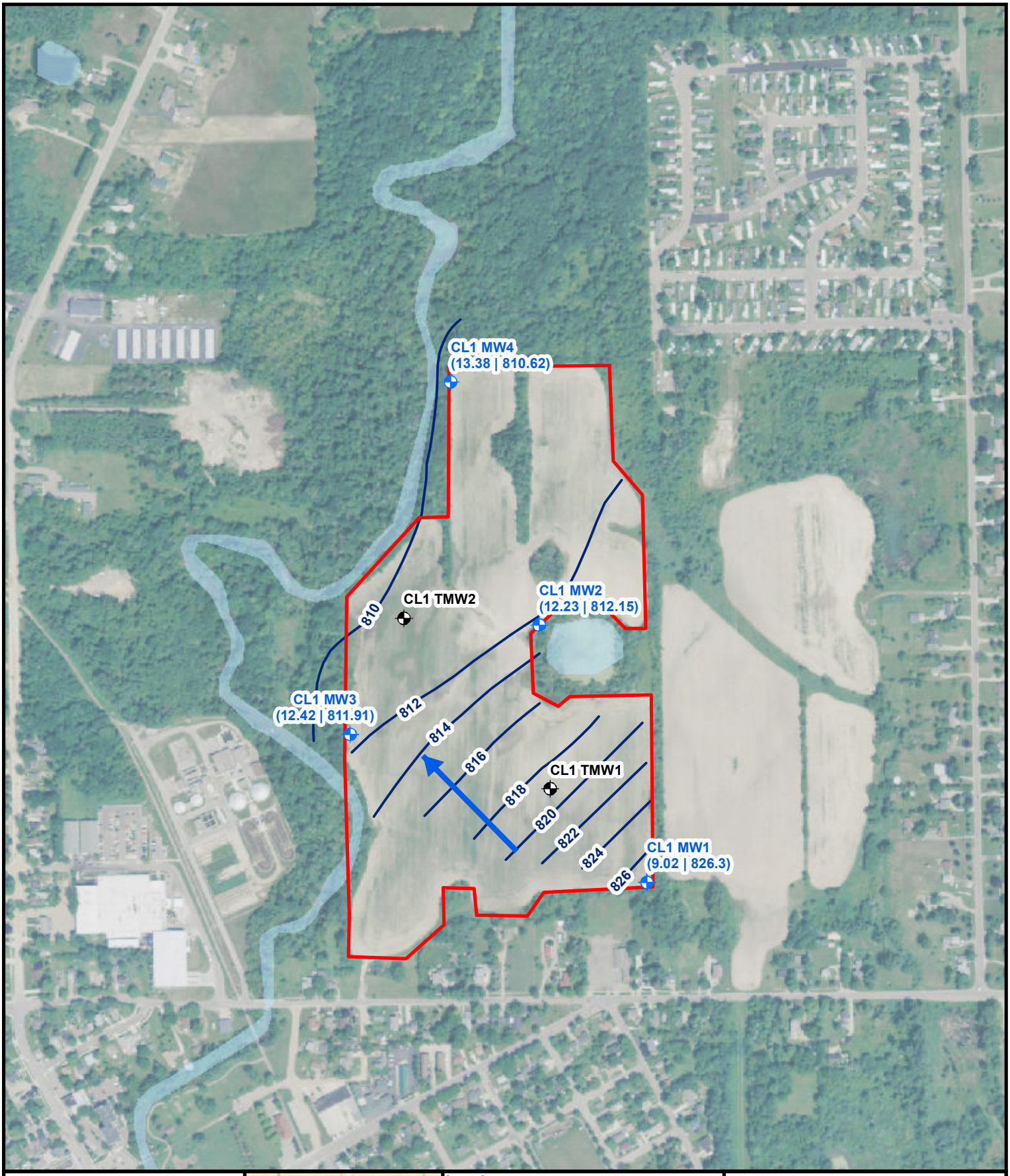
0 250 500 Feet

N

FIGURE 8
08n10e33-CL01
GROUNDWATER PFOA + PFOS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\GW\CL01_groundwater_PFOA_PFOS_heatmap.mxd



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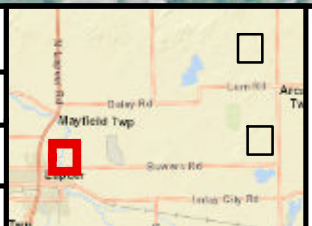
Approved:	Date: 7/11/2018
Project #:	



Legend

- Permanent Monitoring Well Sample (Depth to Water | GW Elevation)
- Temporary Monitoring Well Sample
- GW Flow Direction
- Groundwater Contour
- Site Location
- Surface Water
- 826.30 GW Elevation (ft above mean sea level)

0 250 500 Feet

N

FIGURE 9
08n10e33-CL01
GROUNDWATER CONTOURS

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

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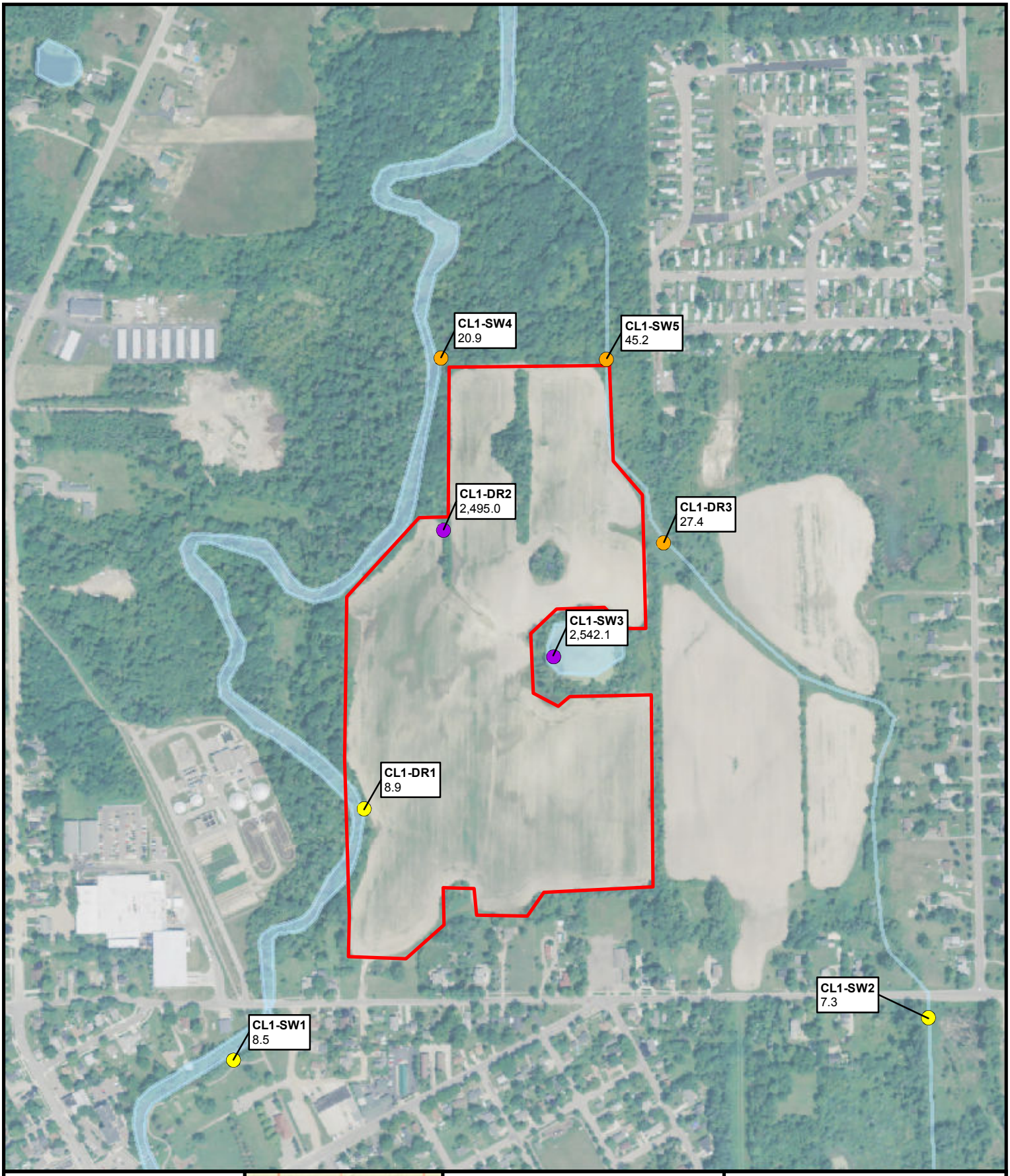

AECOM

Drawn:	Date: 7/11/2018
Approved:	Date: 7/11/2018
Project #:	

Sampling Results
Total PFAS (ng/L or ppt)

- ND
- >0 - 12
- >12 - 70
- >70 - 1000
- >1000

Sample Name
Total PFAS

0 250 500 Feet

N

FIGURE 10
08n10e33-CL01
SURFACE WATER & DRAIN TILE
TOTAL PFAS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

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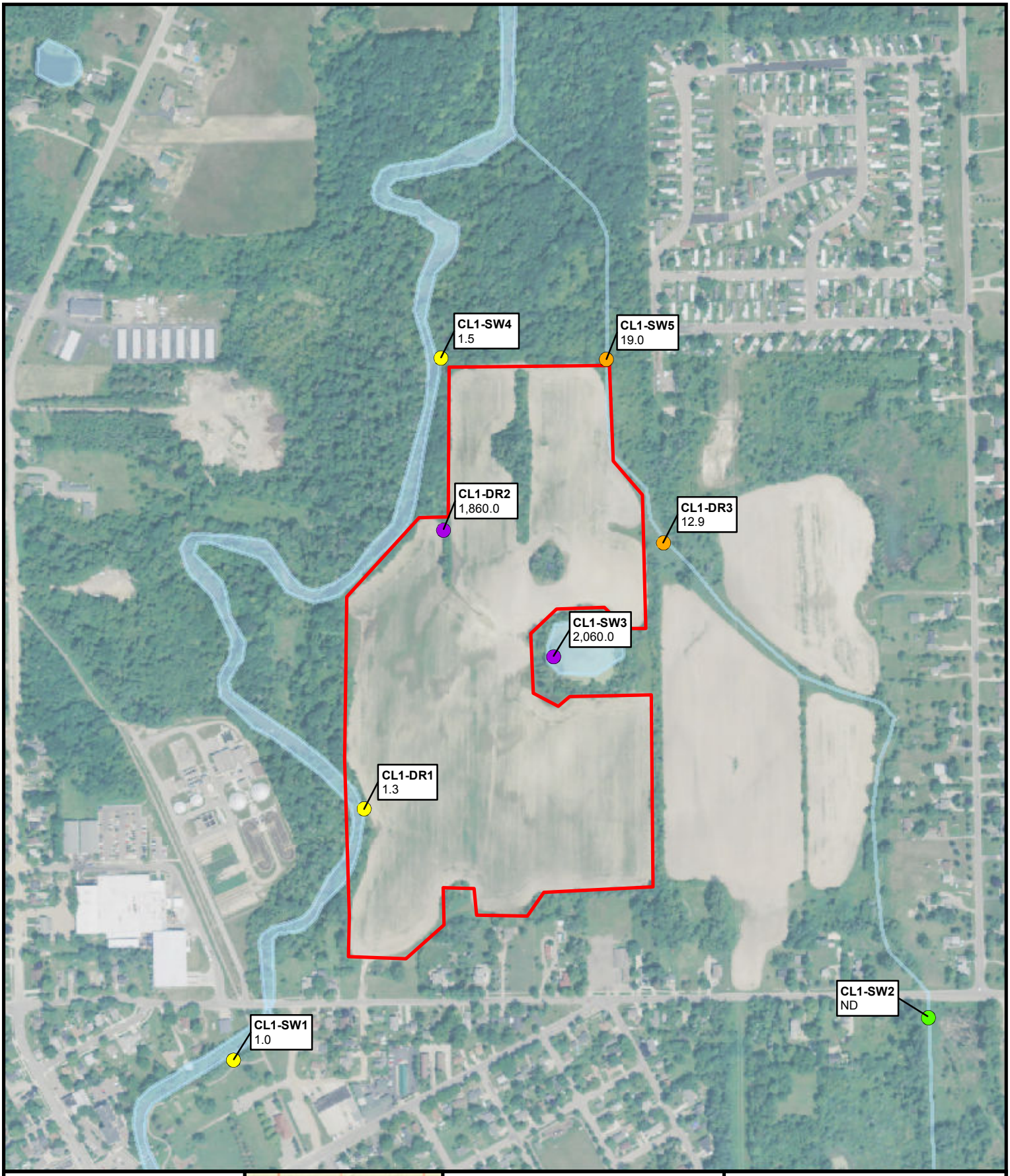

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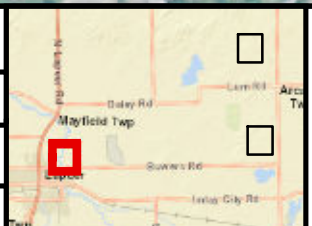
Drawn:	Date: 7/11/2018
Approved:	Date: 7/11/2018
Project #:	



Sampling Results
PFOS (ng/L or ppt)

- ND
- >0 - 12
- >12 - 70
- >70 - 1000
- >1000

Sample Name
PFOS

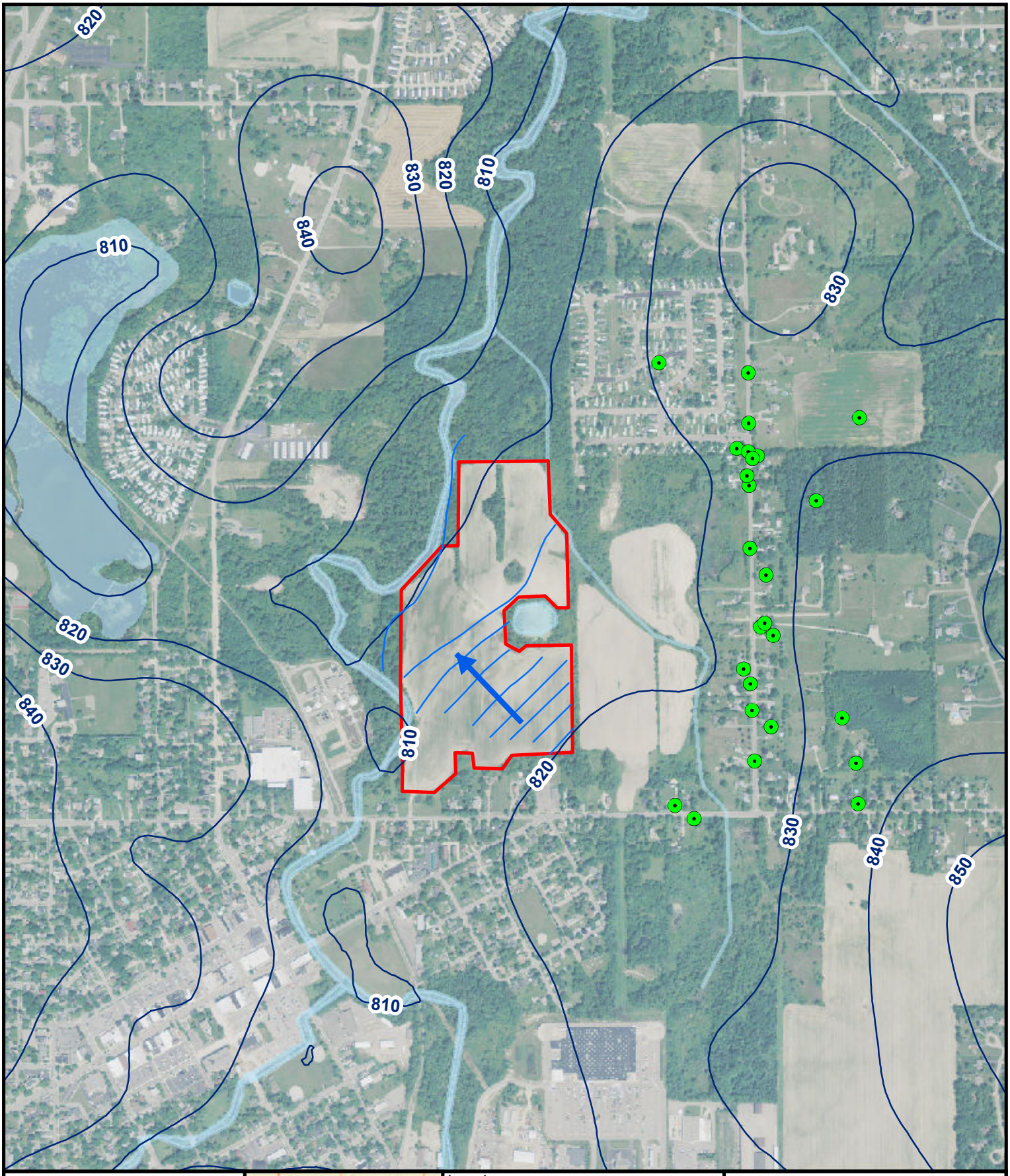
0 250 500 Feet

N

FIGURE 11
08n10e33-CL01
SURFACE WATER & DRAIN TILE
PFOS CONCENTRATION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Heatmaps\SW\CL01_surface_water_PFOS_heatmap.mxd



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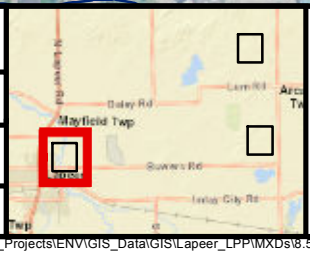
Drawn:	Date: 7/11/2018
Approved:	Date: 7/11/2018
Project #:	



Legend

- Wellogic Wells
- Site Location
- Site Specific 2' GW Contours
- Surface Water
- Groundwater Contour Source: MDEQ
- Groundwater Flow Direction

0 500 1,000 Feet

N

FIGURE 12
08n10e33-CL01
WELLOGIC WELLS & REGIONAL GW FLOW DIRECTION

LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\8.5x11\Wellogic\CL01_groundwater_Wellogic.mxd

Tuscola

Sanilac

Genesee

Lapeer

St. Clair

08n11e16-TG02

08n11e16-TG01

08n11e33-SK01

08n10e33-CL01

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

AECOM

Drawn: JS Date: 9/26/2018

Approved: MW Date: 9/26/2018

Project #: 60570635

Legend

Biosolid Application Field

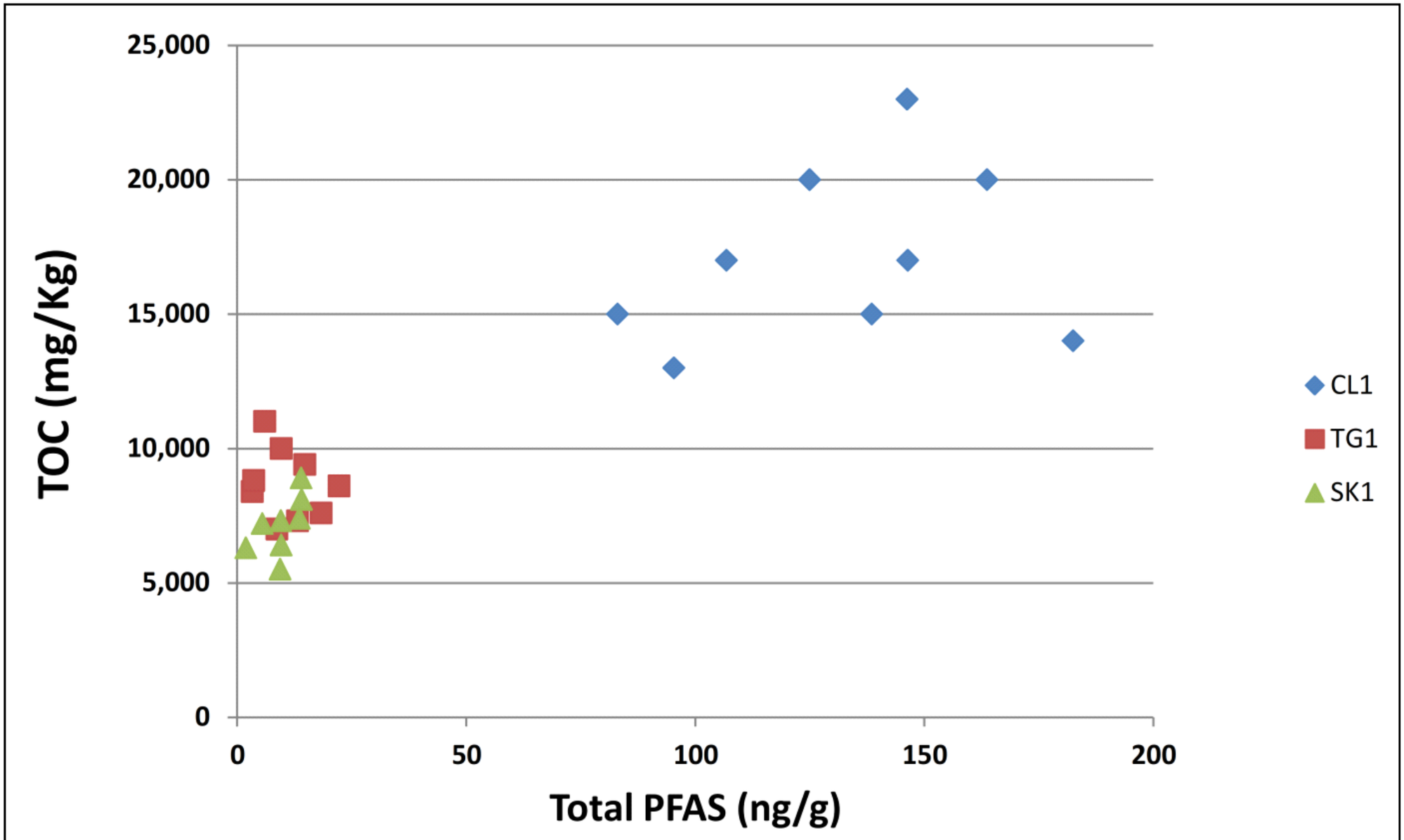
N

0 5 10 Miles

FIGURE 13
REGIONAL GLACIAL GEOLOGY

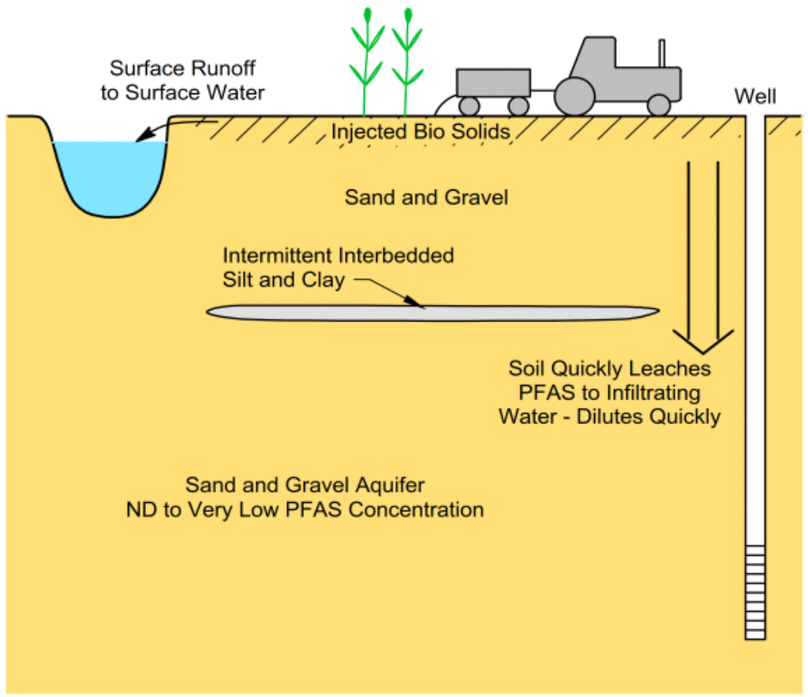
LAPEER BIOSOLIDS ANALYSIS
LAPEER COUNTY, MI

Document Path: G:\GrandRapids\DCS\GIS\ArcMap_GeoDB_Projects\ENV\GIS_Data\GIS\Lapeer_LPP\MXDs\24x36\Regional_glacial_geology_12x16.mxd

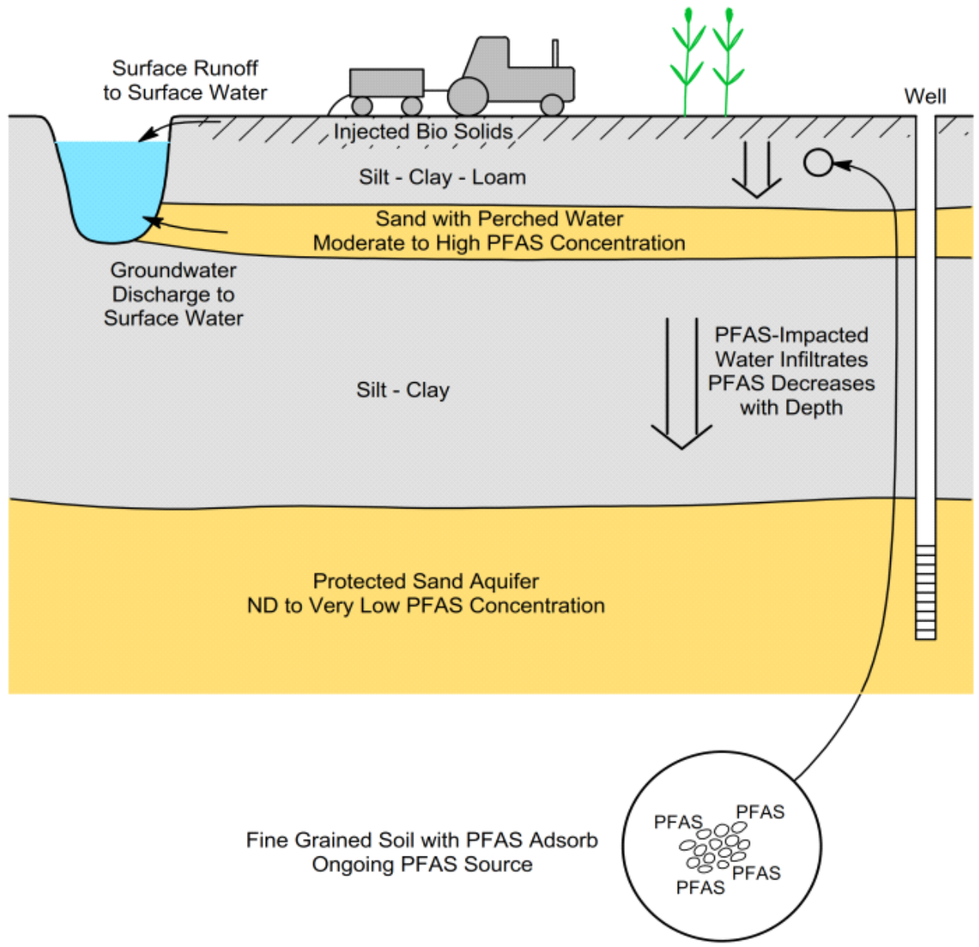


AECOM	Figure 14 Total PFAS vs. TOC
Project #: 60570635	

SITE WITH COARSE-GRAINED SOIL (TG01/SK01)



SITE WITH FINE-GRAINED SOIL (CL01)



AECOM

Project #: 60570635

Figure 15
Conceptual Site Model

Tables

Table 1
Biosolids Application Data
Site 08n10e33-CL01

Annual Report Year	Site ID Number	dT Land Applied	dT/Acre	Acres Used	Acres Approved	Dates of Land Application
2014	08n10e33-CL01	119.5	2.39	50	50	Not provided
2013	08n10e33-CL01	28.7	2.05	14	50	12/13/13 & 12/14/13
2008	08n10e33-CL01	78.5	1.57	50	50	4/9/08 & 4/10/08
2008	08n10e33-CL01	143.5	2.87	50	50	5/10/08, 5/16/08 & 5/17/08
2007	08n10e33-CL01	137	2.74	50	50	5/24/07, 5/25/07, 5/29/07 - 5/31/07
2006	08n10e33-CL01	147.5	2.95	50	50	5/2/06 - 5/6/06
2005	08n10e33-CL01	134.5	2.69	50	50	4/21/05, 4/22/05, 5/6/05 - 5/9/05
2004	08n10e33-CL01	211	4.22	50	50	4/16/04, 4/17/04, 4/19/04 - 4/21/04
2003	08n10e33-CL01	189	3.78	50	50	Not provided
2002	08n10e33-CL01	148	2.96	50	50	11/2/01, 11/5/01 - 11/7/01, 11/10/01
2000	08n10e33-CL01	85.4	2.44	35	50	11/16 & 11/17/99
	Total dT Applied:	1422.6				

Notes:
dT = dry tons

Table 2
Parcel ID: 08n10e33-CL01
MDEQ PFAS Analytical Results Summary

Soil Sample	Sample Date	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFHxDA	PFODA	PFBS	PFHxS	PFHpS	PFOS	PFDS	PFOSA
B-1	12/19/2017	456.62	424.20	2.60	3.50	3.40	1.60	4.20	1.70	4.90	1.10	1.70	0.31	0.51	0.11	ND	0.88	1.00	0.61	420.00	6.00	2.500
B-2	12/20/2017	598.97	564.40	2.00	3.10	3.20	1.60	4.40	1.80	5.90	1.30	2.10	0.34	0.72	0.14	ND	0.89	1.10	0.78	560.00	7.70	1.900
B-3	12/21/2017	557.00	524.30	2.20	3.50	3.10	1.80	4.30	1.80	5.10	1.10	1.90	0.28	0.51	0.12	ND	1.00	1.10	0.69	520.00	6.80	1.700

Surface Water Sample	Sample Date	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFHxDA	PFODA	PFBS	PFHxS	PFHpS	PFOS	PFDS	PFOSA
SW-1	12/21/2017	2,704.30	2,130.00	81.00	130.00	150.00	70.00	130.00	18.00	9.40	ND	ND	ND	ND	ND	ND	96.00	14.00	5.90	2,000.00	ND	ND

ND = Non Detect

Soil concentrations are reported as ug/Kg or ppb

Surface water concentrations are reported as ng/L or ppt

Bolded values indicate detection

PFBA = Perfluorobutanoic acid
PFPeA = 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
PFHxDA = Perfluorohexadecanoic acid
PFODA = Perfluoro-n-octadecanoic acid
PFBS = Perfluorobutane sulfonic acid

PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
PFOSA = Perfluorooctane sulfonamide

Aqueous Criteria (ng/L or ppt)	PFOS	PFOA
Part 31 Generic Residential Groundwater Surface Water Interface Criteria (non-drinking source) (GSIC)	12	12,000
Part 31 Final Chronic Value (FCV)	140,000	880,000
Part 31 Final Acute Value (FAV)	1,600,000	15,000,000

Aqueous Criteria Exceedances:

Blue indicates PFAS exceeded GSIC

Orange indicates PFAS exceeded FCV

Red indicates PFAS exceeded both FCV and FAV

Soil Criteria (ug/kg or ppb)	PFOS	PFOA
Part 201 Generic Residential Groundwater Surface Water Interface Protection Criteria (for soils) (GSIPC)	0.24	10,000
Proposed Drinking Water Protection Criteria (DWPC)	1.4	59

Soil Criteria Exceedances:

Yellow indicates PFAS exceeded GSIPC

Blue indicates PFAS exceeded proposed DWPC

Green indicates PFAS exceeded both proposed DWPC and GSIPC

Table 3
Parcel ID: 08n10e33-CL01
PFAS Soil Analytical Results Summary

Soil Sample	Sample Date	Depth (ft)	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFNS	PFOS	PFDS	4:2 FTS	6:2 FTS	8:2 FTS	PFOSA	EtFOSAA	MeFOSAA
CL1DU10100180501N	**5/1/2018**	**8"**	**83.03**	**78.06**	**0.53**	**0.73**	ND	**0.34**	**0.86**	**0.40**	**1.17**	**0.43**	**0.53**	ND	ND	ND	ND	ND	ND	ND	**77.20**	**0.82**	ND	ND	ND	ND	ND	ND
CL1DU10200180501N	**5/1/2018**	**8"**	**95.32**	**90.61**	**0.43**	**0.61**	ND	**0.36**	**0.91**	**0.39**	**1.45**	ND	**0.56**	ND	ND	ND	ND	ND	ND	ND	**89.70**	**0.91**	ND	ND	ND	ND	ND	ND
CL1DU10300180501N	**5/1/2018**	**8"**	**106.76**	**92.85**	**0.57**	**0.74**	ND	**0.39**	**1.05**	**0.42**	**1.32**	**0.45**	**0.66**	ND	ND	ND	ND	ND	ND	ND	**91.80**	**0.87**	ND	**8.49**	ND	ND	ND	ND
CL1DU20100180501N	**5/1/2018**	**8"**	**124.92**	**118.53**	**0.50**	**0.91**	ND	**0.43**	**1.53**	**0.63**	**1.39**	ND	**0.43**	ND	ND	ND	ND	**0.50**	ND	ND	**117.00**	**1.59**	ND	ND	ND	ND	ND	ND
CL1DU20200180501N	**5/1/2018**	**8"**	**146.18**	**138.41**	**0.65**	**0.93**	**1.02**	**0.45**	**1.41**	**0.49**	**1.56**	ND	**0.54**	ND	ND	ND	ND	ND	ND	ND	**137.00**	**1.81**	ND	ND	ND	**0.32**	ND	ND
CL1DU20300180501N	**5/1/2018**	**8"**	**163.70**	**153.65**	**0.57**	**1.08**	**1.10**	**0.54**	**1.65**	**0.55**	**1.69**	**0.47**	**0.57**	ND	ND	ND	ND	**0.47**	ND	ND	**152.00**	**1.99**	ND	ND	ND	**0.56**	ND	**0.47**
CL1DU30100180502N	**5/2/2018**	**8"**	**146.40**	**139.47**	**0.56**	**1.01**	ND	**0.58**	**1.47**	**0.63**	**1.46**	ND	**0.82**	ND	ND	ND	ND	ND	ND	ND	**138.00**	**1.55**	ND	ND	ND	**0.33**	ND	ND
CL1DU30200180502N	**5/2/2018**	**8"**	**182.46**	**173.83**	**0.51**	**0.91**	**1.02**	**0.60**	**1.83**	**0.64**	**1.72**	**0.44**	**0.65**	ND	ND	ND	ND	ND	ND	ND	**172.00**	**1.35**	ND	ND	ND	**0.41**	ND	**0.38**
CL1DU30300180502N	**5/2/2018**	**8"**	**138.46**	**125.28**	**0.52**	**0.74**	**0.72**	**0.50**	**1.28**	**0.59**	**1.38**	ND	**0.60**	ND	ND	ND	ND	ND	ND	ND	**124.00**	**1.01**	ND	**7.11**	ND	ND	ND	ND

ND = Non Detect
Concentrations are reported as ng/g or ppb
FB = Field Blank

Bolded values indicate detection

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFPeS = Perfluoropentane sulfonic 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
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFNS = Pefluorononane sulfonic acid

PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 6:2 Fluorotelomer sulfonic acid
8:2 FTSA = 8:2 Fluorotelomer sulfonic acid
POSA = Perfluorooctane sulfonamide
EtFOSAA - N-Ethyl Perfluorooctane sulfonamindoacetic acid
MeFOSAA = N-Methyl Perfluorooctane sulfonamide

Soil Criteria (ug/kg or ppb):	PFOS	PFOA
Part 201 Generic Residential Groundwater Surface Water Interface Protection Criteria (for soils) (GSIPC)	0.24	10,000
Proposed Drinking Water Protection Criteria (DWPC)	1.4	59

Soil Criteria Exceedances:
Yellow indicates PFAS exceeded GSIPC
Blue indicates PFAS exceeded proposed DWPC
Green indicates PFAS exceeded both proposed DWPC and GSIPC

Table 4
Parcel ID: 08n10e33-CL01
PFAS and TOC Soil Analytical Results Summary

Soil Sample	Sample Date	Depth (ft)	Total PFASs	Total TOC	Soil Survey	Soil Boring
CL1DU10100180501N	5/1/2018	0.7	83.03	15,000	DrA/DrB	Silty Sand Sand with Gravel
CL1DU10200180501N	5/1/2018	0.7	95.32	13,000	DrA/DrB	Silty Sand Sand with Gravel
CL1DU10300180501N	5/1/2018	0.7	106.76	17,000	DrA/DrB	Silty Sand Sand with Gravel
CL1DU20100180501N	5/1/2018	0.7	124.92	20,000	Le	Clay
CL1DU20200180501N	5/1/2018	0.7	146.18	23,000	Le	Clay
CL1DU20300180501N	5/1/2018	0.7	163.70	20,000	Le	Clay
CL1DU30100180502N	5/2/2018	0.7	146.40	17,000	DrA	Sand Sand with Gravel
CL1DU30200180502N	5/2/2018	0.7	182.46	14,000	DrA	Sand Sand with Gravel
CL1DU30300180502N	5/2/2018	0.7	138.46	15,000	DrA	Sand Sand with Gravel

ND = Non Detect
PFAS concentrations are reported as ng/g or ppb
TOC concentrations are reported as mg/Kg or ppb
DrA/DrB - Del Ray silt loam
Le - Lenawee silty clay loam

Table 5
Parcel ID: 08n10e33-CL01
Temporary Well and Monitoring Well Construction

WELL ID	Well size / Material	Depth to Water ft BGS	Screen Interval ft BGS
MW1	2" pvc	9.02	24-29
MW2	2" pvc	12.23	29-34
MW3	2" pvc	12.42	24-29
MW4	2" pvc	13.38	14-19
TMW1	1" pvc	23.8	18-23
TMW2	1" pvc	4.19	4-9

Footnotes:
BGS = below ground surface
ft = feet
pvc = polyvinyl chloride

Table 6
Parcel ID: 08n10e33-CL01
Stablized Water Quality Parameters

Well ID	Date	Sample Interval	Time Collected	pH	Cond.	Turbidity	D.O.	Temp	ORP
		ft	24hr	SU	uS/cm	NTU	mg/L	°C	mV
MW1	**5/10/18**	27.50	0955	7.05	1085	113	0.08	11.6	-62.6
MW2	**5/10/18**	35.00	1235	7.55	449	67	2.00	12.6	117.6
MW3	**5/10/18**	28.50	1125	7.14	717	73	3.50	11.5	67.6
MW4	**5/10/18**	17.00	1345	7.13	664	5	5.45	11.7	177.3

Notes:

ft = Feet
SU = Standard Unit
uS/cm = Microsiemens/centimeter
NTU = Nephelometric Turbidity Units
mg/L = Milligrams/Liter
mV = Millivolt

°C = Degrees Celsius
Cond. = Conductivity
D.O. = Dissolved Oxygen
Temp. = Temperature
ORP = Oxidization-Reduction Potential

* Values in this table are the final "Stabilized" parameters

Table 7
Parcel ID: 08n10e33-CL01
PFAS Groundwater Analytical Results Summary

Groundwater Sample	Sample Date	Depth (ft)	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFNS	PFOS	PFDS	4:2 FTS	6:2 FTS	8:2 FTS	PFOSA	EtFOSAA	MeFOSAA
CL1MW0124180510N	5/10/2018	24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CL1MW0229180510N	5/10/2018	29	**7.95**	**4.79**	**1.11**	**1.43**	ND	**0.61**	**0.70**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.09**	ND	ND	ND	ND	ND	ND	ND
CL1MW0324180510N	5/10/2018	24	**3.75**	**2.39**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.39**	ND	ND	**1.36**	ND	ND	ND	ND
CL1MW0414180510N	5/10/2018	14	**455.28**	**57.10**	**80.20**	**107.00**	**103.00**	**31.50**	**43.20**	ND	ND	ND	ND	ND	ND	**68.90**	ND	**3.55**	ND	ND	**13.90**	ND	ND	**4.03**	ND	ND	ND	ND
CL1TMW0118180503N	5/3/2018	18	**15.87**	**15.87**	ND	ND	ND	ND	**0.87**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**15.00**	ND	ND	ND	ND	ND	ND	ND
CL1TMW0205180504N	5/4/2018	5	**41,822.84**	**37,230.00**	**492.00**	**944.00**	**1,140.00**	**662.00**	**1,930.00**	**241.00**	**385.00**	**10.00**	**3.62**	ND	ND	**531.00**	**4.90**	**115.00**	**43.50**	ND	**35,300.00**	**2.03**	ND	**2.07**	ND	**12.10**	**4.62**	ND

ND = Non Detect
Concentrations are reported as ng/L or ppt
FB = Field Blank

Bolded values indicate detection

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFPeS = Perfluoropentane sulfonic 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
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PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFNS = Pefluorononane sulfonic acid

PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 6:2 Fluorotelomer sulfonic acid
8:2 FTSA = 8:2 Fluorotelomer sulfonic acid
POSA = Perfluorooctane sulfonamide
EtFOSAA - N-Ethyl Perfluorooctane sulfonamindoacetic acid
MeFOSAA = N-Methyl Perfluorooctane sulfonamide

Aqueous Criteria (ng/L or ppt):	PFOS	PFOA
Part 201 Generic Residential Drinking Water Criteria (DWC)	70	70
Part 31 Generic Residential Groundwater Surface Water Interface Criteria (non-drinking source) (GSIC)	12	12,000
Part 31 Final Chronic Value (FCV)	140,000	880,000
Part 31 Final Acute Value (FAV)	1,600,000	15,000,000

Aqueous Criteria Exceedances:

Yellow indicates PFAS exceeded DWC
Blue indicates PFAS exceeded GSIC
Green indicates PFAS exceeded both DWC and GSIC
Orange indicates PFAS exceeded FCV
Red indicates PFAS exceeded both FCV and FAV

Table 8
Parcel ID: 08n10e33-CL01
Groundwater Elevations

WELL ID	Well size / Material	Top of Casing Elevation ft AMSL	Depth to Water ft BTOC	Groundwater Elevation ft AMSL	Screen Interval ft BTOC	Screen Interval Elevation ft AMSL
MW-1	2" pvc	835.32	9.02	826.30	24-29	808.32-803.32
MW-2	2" pvc	824.38	12.23	812.15	29-34	792.38-787.38
MW-3	2" pvc	824.33	12.42	811.91	24-29	797.33-792.33
MW-4	2" pvc	824.00	13.38	810.62	14-19	807.00-802.00

Footnotes:

amsl = above mean sea level

btoc = below top of casing

ft = feet

pvc = polyvinyl chloride

Table 9
Parcel ID: 08n10e33-CL01
PFAS Surface Water Analytical Results Summary

Surface Water/Drain Tile Sample	Sample Date	Depth (ft)	Total PFASs	PFOA + PFOS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	PFBS	PFPeS	PFHxS	PFHpS	PFNS	PFOS	PFDS	4:2 FTS	6:2 FTS	8:2 FTS	PFOSA	EtFOSAA	MeFOSAA
CL1DR0100180508N	5/8/2018	surface	**8.99**	**2.66**	**2.58**	**0.92**	ND	**0.68**	**1.32**	ND	ND	ND	ND	ND	ND	**1.22**	ND	ND	**0.93**	ND	**1.34**	ND	ND	ND	ND	ND	ND	ND
CL1DR0200180509N	5/9/2018	surface	**2,495.04**	**1,955.20**	**78.60**	**113.00**	**135.00**	**61.10**	**95.20**	**23.50**	**30.10**	**2.41**	ND	ND	ND	**80.80**	**1.39**	**8.82**	**3.95**	ND	**1,860.00**	**1.17**	ND	ND	ND	ND	ND	ND
CL1DR0300180508N	5/8/2018	surface	**27.35**	**15.40**	**3.73**	**5.29**	ND	ND	**2.50**	ND	ND	ND	ND	ND	ND	**2.93**	ND	ND	ND	ND	**12.90**	ND	ND	ND	ND	ND	ND	ND
CL1SW0100180509N	5/9/2018	surface	**8.47**	**2.15**	**2.80**	**0.93**	ND	**0.58**	**1.11**	ND	ND	ND	ND	ND	ND	**1.07**	ND	ND	**0.95**	ND	**1.04**	ND	ND	ND	ND	ND	ND	ND
CL1SW0200180509N	5/9/2018	surface	**7.28**	**1.00**	**2.12**	**2.87**	ND	ND	**1.00**	ND	ND	ND	ND	ND	ND	**1.29**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CL1SW0300180508N	5/8/2018	surface	**2,542.12**	**2,161.00**	**48.90**	**81.50**	**92.40**	**47.70**	**101.00**	**14.60**	**9.17**	ND	ND	ND	ND	**68.50**	**1.72**	**11.60**	**5.03**	ND	**2,060.00**	ND	ND	ND	ND	ND	ND	ND
CL1SW0400180508N	5/8/2018	surface	**20.88**	**2.71**	**3.31**	**3.67**	**4.13**	**4.59**	**1.24**	ND	ND	ND	ND	ND	ND	**1.55**	ND	ND	**0.92**	ND	**1.47**	ND	ND	ND	ND	ND	ND	ND
CL1SW0500180508N	5/8/2018	surface	**45.21**	**22.62**	**4.31**	**6.55**	**4.64**	**2.23**	**3.62**	ND	ND	ND	ND	ND	ND	**3.51**	ND	**1.35**	ND	ND	**19.00**	ND	ND	ND	ND	ND	ND	ND

ND = Non Detect
Concentrations are reported as ng/L or ppt
FB = Field Blank

Bolded values indicates detection

PFBA = Perfluorobutanoic acid
PFPeA = Perfluoropentanoic acid
PFPeS = Perfluoropentane sulfonic 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
PFHxS = Perfluorohexane sulfonic acid
PFHpS = Perfluoroheptane sulfonic acid
PFNS = Pefluorononane sulfonic acid

PFOS = Perfluorooctane sulfonic acid
PFDS = Perfluorodecane sulfonic acid
4:2 FTSA = 4:2 Fluorotelomer sulfonic acid
6:2 FTSA = 6:2 Fluorotelomer sulfonic acid
8:2 FTSA = 8:2 Fluorotelomer sulfonic acid
POSA = Perfluorooctane sulfonamide
EtFOSAA - N-Ethyl Perfluorooctane sulfonamindoacetic acid
MeFOSAA = N-Methyl Perfluorooctane sulfonamide

Aqueous Criteria (ng/L or ppt):	PFOS	PFOA
Part 31 Generic Residential Groundwater Surface Water Interface Criteria (non-drinking source) (GSIC)	12	12,000
Part 31 Final Chronic Value (FCV)	140,000	880,000
Part 31 Final Acute Value (FAV)	1,600,000	15,000,000

Aqueous Criteria Exceedances:
Blue indicates PFAS exceeded GSIC
Orange indicates PFAS exceeded FCV
Red indicates PFAS exceeded both FCV and FAV

Appendix A

June 07, 2018

Vista Work Order No. 1800898

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 May 04, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'Lapeer Sampling'.

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.

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. 1800898
Case Narrative

Sample Condition on Receipt:

Eighteen soil 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. Two sample ID anomalies were resolved as directed: the sample IDs were reported as listed on the sample labels.

Analytical Notes:

VAL-PFAS

The soils were dried and homogenzied following Vista's Incremental Sampling Procedure. The subsamples were extracted and analyzed for a selected list of PFAS using VAL Method PFAS.

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 listed in the table below.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1800898-01	CLIDU10100180501N	VAL - PFAS	13C8-PFOSA	H	49.7
1800898-04	CLIDU20100180501N	VAL - PFAS	13C3-PFBA	H	43.0
1800898-05	CLIDU20200180501N	VAL - PFAS	13C3-PFBA	H	30.4
1800898-05	CLIDU20200180501N	VAL - PFAS	13C8-PFOSA	H	47.5
1800898-06	CLIDU20300180501N	VAL - PFAS	13C3-PFBA	H	41.1
1800898-06	CLIDU20300180501N	VAL - PFAS	13C8-PFOSA	H	42.7
B8E0193-BLK1	B8E0193-BLK1	VAL - PFAS	13C8-PFOSA	H	26.0
B8E0193-BS1	B8E0193-BS1	VAL - PFAS	13C8-PFOSA	H	34.3

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800898-01	CLIDU10100180501N	ISM01-May-18 10:30	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
				HDPE Jar, 6 oz
1800898-02	CLIDU10300180501N	ISM01-May-18 12:00	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-03	CLIDU10200180501N	ISM01-May-18 12:30	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-04	CLIDU20100180501N	ISM01-May-18 15:00	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-05	CLIDU20200180501N	ISM01-May-18 17:00	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-06	CLIDU20300180501N	ISM01-May-18 18:00	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-07	CLIDU30100180502N	ISM02-May-18 18:25	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-08	CLIDU30200180502N	ISM02-May-18 18:30	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz

Vista Project: 1800898

Client Project: Lapeer Sampling

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800898-08	CLIDU30200180502N	ISM02-May-18 18:30	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-09	CLIDU30300180502N	ISM02-May-18 18:35	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-10	TGIDU30100180426N	ISM26-Apr-18 15:30	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-11	TGIDU30200180426N	ISM26-Apr-18 15:35	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-12	TGIDU30300180426N	ISM26-Apr-18 15:40	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-13	TGIDU10200180427N	ISM27-Apr-18 09:25	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-14	TGIDU10300180427N	ISM27-Apr-18 09:30	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 125 mL
1800898-15	TGIDU10100180426N	ISM26-Apr-18 17:15	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-16	TGIDU20100180430N	ISM30-Apr-18 18:35	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800898-16	TGIDU20100180430N	ISM30-Apr-18 18:35	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-17	TGIDU20200180430N	ISM30-Apr-18 18:40	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L
1800898-18	TGIDU20300180430N	ISM30-Apr-18 18:45	04-May-18 09:48	HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Jar, 6 oz
				HDPE Bottle, 1L

ANALYTICAL RESULTS

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8E0193-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	0.140	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFPeA	2706-90-3	ND	0.202	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFBS	375-73-5	ND	0.363	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFHxA	307-24-4	ND	0.203	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFHpA	375-85-9	ND	0.205	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFHxS	355-46-4	ND	0.310	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
6:2 FTS	27619-97-2	ND	0.229	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFOA	335-67-1	ND	0.236	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFHpS	375-92-8	ND	0.170	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFNA	375-95-1	ND	0.178	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFDA	335-76-2	ND	0.256	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
8:2 FTS	39108-34-4	ND	0.285	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFOSA	754-91-6	ND	0.227	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
MeFOSAA	2355-31-9	ND	0.302	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFDS	335-77-3	ND	0.201	1.00	2.00		B8E0193	23-May-18	1.00 g	31-May-18 00:30	1
PFUnA	2058-94-8	ND	0.354	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
EtFOSAA	2991-50-6	ND	0.321	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFDoA	307-55-1	ND	0.276	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFTrDA	72629-94-8	ND	0.122	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFTeDA	376-06-7	ND	0.198	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFNS	68259-12-1	ND	1.43	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.0	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C3-PFPeA	IS	96.3	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C3-PFBS	IS	112	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C2-PFHxA	IS	94.1	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C4-PFHpA	IS	85.2	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
18O2-PFHxS	IS	102	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C2-PFOA	IS	82.0	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C8-PFOS	IS	92.3	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C5-PFNA	IS	71.0	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C2-PFDA	IS	67.2	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C8-PFOSA	IS	26.0	50 - 150	H	B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
d3-MeFOSAA	IS	77.2	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C2-PFUnA	IS	70.5	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8E0193-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	83.8	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C2-PFDoA	IS	73.3	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1
13C2-PFTeDA	IS	73.8	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:25	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8E0193-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	9.51	10.0	95.1	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFPeA	2706-90-3	9.57	10.0	95.7	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFBS	375-73-5	9.12	10.0	91.2	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFHxA	307-24-4	9.78	10.0	97.8	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFHpA	375-85-9	9.41	10.0	94.1	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFHxS	355-46-4	9.26	10.0	92.6	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
6:2 FTS	27619-97-2	9.85	10.0	98.5	60-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFOA	335-67-1	8.38	10.0	83.8	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFHpS	375-92-8	11.4	10.0	114	60-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFOS	1763-23-1	9.32	10.0	93.2	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFNA	375-95-1	8.87	10.0	88.7	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFDA	335-76-2	9.05	10.0	90.5	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
8:2 FTS	39108-34-4	9.25	10.0	92.5	60-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFOSA	754-91-6	10.9	10.0	109	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
MeFOSAA	2355-31-9	9.59	10.0	95.9	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFDS	335-77-3	11.1	10.0	111	60-130		B8E0193	23-May-18	1.00 g	31-May-18 00:19	1
PFUnA	2058-94-8	9.87	10.0	98.7	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
EtFOSAA	2991-50-6	10.2	10.0	102	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFDoA	307-55-1	11.9	10.0	119	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFTrDA	72629-94-8	10.8	10.0	108	60-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFTeDA	376-06-7	11.1	10.0	111	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFNS	68259-12-1	9.64	10.0	96.4	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
PFPeS	2706-91-4	9.64	10.0	96.4	70-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
4:2 FTS	757124-72-4	8.40	10.0	84.0	60-130		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.3	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C3-PFPeA	IS	90.6	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C3-PFBS	IS	103	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C2-PFHxA	IS	93.8	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C4-PFHpA	IS	94.6	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
18O2-PFHxS	IS	100	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C2-PFOA	IS	82.6	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C8-PFOS	IS	87.4	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C5-PFNA	IS	77.7	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C2-PFDA	IS	76.9	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Matrix: Solid

Laboratory Data

Lab Sample: B8E0193-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	34.3	50- 150	H	B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
d3-MeFOSAA	IS	75.1	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C2-PFUnA	IS	66.5	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
d5-EtFOSAA	IS	78.0	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C2-PFDoA	IS	77.7	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1
13C2-PFTeDA	IS	70.3	50- 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:14	1

Sample ID: CLIDU10100180501N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 10:30

Laboratory Data

Lab Sample: 1800898-01
Date Received: 04-May-18 09:48
% Solids: 87.6
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.530	0.160	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFPeA	2706-90-3	0.732	0.231	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFBS	375-73-5	ND	0.414	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFHxA	307-24-4	ND	0.232	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFHpA	375-85-9	0.342	0.234	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFHxS	355-46-4	ND	0.354	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
6:2 FTS	27619-97-2	ND	0.261	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFOA	335-67-1	0.861	0.269	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFHpS	375-92-8	ND	0.194	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFOS	1763-23-1	77.2	0.965	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFNA	375-95-1	0.401	0.203	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFDA	335-76-2	1.17	0.292	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
8:2 FTS	39108-34-4	ND	0.325	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFOSA	754-91-6	ND	0.259	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
MeFOSAA	2355-31-9	ND	0.345	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFDS	335-77-3	0.822	0.229	1.14	2.28	J	B8E0193	23-May-18	1.00 g	31-May-18 00:40	1
PFUnA	2058-94-8	0.434	0.404	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
EtFOSAA	2991-50-6	ND	0.366	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFDoA	307-55-1	0.533	0.315	1.14	2.28	J	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFTrDA	72629-94-8	ND	0.139	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFTeDA	376-06-7	ND	0.226	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFNS	68259-12-1	ND	1.63	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
PFPeS	2706-91-4	ND	0.965	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
4:2 FTS	757124-72-4	ND	0.965	1.14	2.28		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.1	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C3-PFPeA	IS	93.8	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C3-PFBS	IS	108	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C2-PFHxA	IS	90.7	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C4-PFHpA	IS	96.9	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
18O2-PFHxS	IS	95.1	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C2-PFOA	IS	77.5	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C8-PFOS	IS	95.3	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C5-PFNA	IS	74.1	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C2-PFDA	IS	66.0	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C8-PFOSA	IS	49.7	50 - 150	H	B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
d3-MeFOSAA	IS	80.4	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C2-PFUnA	IS	80.7	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1

Sample ID: CLIDU10100180501N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 10:30

Laboratory Data

Lab Sample: 1800898-01
Date Received: 04-May-18 09:48
% Solids: 87.6
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	92.2	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C2-PFDoA	IS	82.7	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1
13C2-PFTeDA	IS	74.0	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 11:35	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CLIDU10300180501N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 12:00

Laboratory Data

Lab Sample: 1800898-02
Date Received: 04-May-18 09:48
% Solids: 86.3
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.571	0.164	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFPeA	2706-90-3	0.742	0.236	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFBS	375-73-5	ND	0.425	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFHxA	307-24-4	ND	0.238	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFHpA	375-85-9	0.388	0.240	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFHxS	355-46-4	ND	0.363	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
6:2 FTS	27619-97-2	8.49	0.268	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFOA	335-67-1	1.05	0.276	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFHpS	375-92-8	ND	0.199	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFOS	1763-23-1	91.8	0.989	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFNA	375-95-1	0.417	0.208	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFDA	335-76-2	1.32	0.300	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
8:2 FTS	39108-34-4	ND	0.334	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFOSA	754-91-6	ND	0.266	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
MeFOSAA	2355-31-9	ND	0.353	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFDS	335-77-3	0.871	0.235	1.17	2.34	J	B8E0193	23-May-18	0.990 g	31-May-18 00:50	1
PFUnA	2058-94-8	0.452	0.414	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
EtFOSAA	2991-50-6	ND	0.376	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFDoA	307-55-1	0.663	0.323	1.17	2.34	J	B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFTrDA	72629-94-8	ND	0.143	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFTeDA	376-06-7	ND	0.232	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFNS	68259-12-1	ND	1.67	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
PFPeS	2706-91-4	ND	0.989	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
4:2 FTS	757124-72-4	ND	0.989	1.17	2.34		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.8	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C3-PFPeA	IS	87.5	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C3-PFBS	IS	104	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C2-PFHxA	IS	91.8	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C4-PFHpA	IS	91.0	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
18O2-PFHxS	IS	92.4	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C2-PFOA	IS	83.7	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C8-PFOS	IS	91.6	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C5-PFNA	IS	85.5	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C2-PFDA	IS	96.5	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C8-PFOSA	IS	54.3	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
d3-MeFOSAA	IS	85.3	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C2-PFUnA	IS	80.4	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1

Sample ID: CLIDU10300180501N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 12:00

Laboratory Data

Lab Sample: 1800898-02
Date Received: 04-May-18 09:48
% Solids: 86.3
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	89.3	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C2-PFDoA	IS	86.9	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1
13C2-PFTeDA	IS	80.2	50 - 150		B8E0193	23-May-18	0.990 g	01-Jun-18 11:46	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CLIDU10200180501N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 12:30

Laboratory Data

Lab Sample: 1800898-03
Date Received: 04-May-18 09:48
% Solids: 87.2
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.425	0.127	0.910	1.82	J	B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFPeA	2706-90-3	0.611	0.184	0.910	1.82	J	B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFBS	375-73-5	ND	0.330	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFHxA	307-24-4	ND	0.185	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFHpA	375-85-9	0.361	0.186	0.910	1.82	J	B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFHxS	355-46-4	ND	0.282	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
6:2 FTS	27619-97-2	ND	0.208	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFOA	335-67-1	0.913	0.215	0.910	1.82	J	B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFHpS	375-92-8	ND	0.155	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFOS	1763-23-1	89.7	0.769	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFNA	375-95-1	0.394	0.162	0.910	1.82	J	B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFDA	335-76-2	1.45	0.233	0.910	1.82	J	B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
8:2 FTS	39108-34-4	ND	0.259	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFOSA	754-91-6	ND	0.207	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
MeFOSAA	2355-31-9	ND	0.275	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFDS	335-77-3	0.908	0.183	0.910	1.82	J	B8E0193	23-May-18	1.26 g	31-May-18 01:01	1
PFUnA	2058-94-8	ND	0.322	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
EtFOSAA	2991-50-6	ND	0.292	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFDoA	307-55-1	0.559	0.251	0.910	1.82	J	B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFTrDA	72629-94-8	ND	0.111	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFTeDA	376-06-7	ND	0.180	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFNS	68259-12-1	ND	1.30	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
PFPeS	2706-91-4	ND	0.769	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
4:2 FTS	757124-72-4	ND	0.769	0.910	1.82		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.0	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C3-PFPeA	IS	91.2	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C3-PFBS	IS	105	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C2-PFHxA	IS	95.1	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C4-PFHpA	IS	93.2	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
18O2-PFHxS	IS	89.6	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C2-PFOA	IS	75.0	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C8-PFOS	IS	89.7	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C5-PFNA	IS	90.7	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C2-PFDA	IS	84.5	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C8-PFOSA	IS	58.5	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
d3-MeFOSAA	IS	98.2	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C2-PFUnA	IS	84.5	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1

Sample ID: CLIDU10200180501N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 12:30

Laboratory Data

Lab Sample: 1800898-03
Date Received: 04-May-18 09:48
% Solids: 87.2
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	103	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C2-PFDoA	IS	82.4	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1
13C2-PFTeDA	IS	89.9	50 - 150		B8E0193	23-May-18	1.26 g	01-Jun-18 11:56	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CLIDU20100180501N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 15:00

Laboratory Data

Lab Sample: 1800898-04
Date Received: 04-May-18 09:48
% Solids: 85.0
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.497	0.194	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFPeA	2706-90-3	0.914	0.280	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFBS	375-73-5	ND	0.502	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFHxA	307-24-4	ND	0.281	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFHpA	375-85-9	0.434	0.284	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFHxS	355-46-4	0.504	0.429	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
6:2 FTS	27619-97-2	ND	0.317	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFOA	335-67-1	1.53	0.327	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFHpS	375-92-8	ND	0.235	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFOS	1763-23-1	117	1.17	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFNA	375-95-1	0.631	0.246	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFDA	335-76-2	1.39	0.354	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
8:2 FTS	39108-34-4	ND	0.394	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFOSA	754-91-6	ND	0.314	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
MeFOSAA	2355-31-9	ND	0.418	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFDS	335-77-3	1.59	0.278	1.38	2.77	J	B8E0193	23-May-18	0.850 g	31-May-18 01:11	1
PFUnA	2058-94-8	ND	0.490	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
EtFOSAA	2991-50-6	ND	0.444	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFDoA	307-55-1	0.427	0.382	1.38	2.77	J	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFTrDA	72629-94-8	ND	0.169	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFTeDA	376-06-7	ND	0.274	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFNS	68259-12-1	ND	1.98	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
PFPeS	2706-91-4	ND	1.17	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
4:2 FTS	757124-72-4	ND	1.17	1.38	2.77		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	43.0	50 - 150	H	B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C3-PFPeA	IS	88.6	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C3-PFBS	IS	96.6	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C2-PFHxA	IS	90.6	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C4-PFHpA	IS	100	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
18O2-PFHxS	IS	89.5	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C2-PFOA	IS	81.0	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C8-PFOS	IS	97.4	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C5-PFNA	IS	94.1	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C2-PFDA	IS	93.6	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C8-PFOSA	IS	50.1	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
d3-MeFOSAA	IS	76.7	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C2-PFUnA	IS	80.4	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1

Sample ID: CLIDU20100180501N

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	01-May-18 15:00
Location:	08n10e33-CL01		

Laboratory Data

Lab Sample:	1800898-04	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	85.0		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	82.3	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C2-PFDoA	IS	73.7	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1
13C2-PFTeDA	IS	77.3	50 - 150		B8E0193	23-May-18	0.850 g	01-Jun-18 12:07	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.

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

Sample ID: CLIDU20200180501N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 01-May-18 17:00

Laboratory Data

Lab Sample: 1800898-05
Date Received: 04-May-18 09:48
% Solids: 88.4
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.646	0.163	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFPeA	2706-90-3	0.930	0.236	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFBS	375-73-5	ND	0.424	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFHxA	307-24-4	1.02	0.237	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFHpA	375-85-9	0.452	0.239	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFHxS	355-46-4	ND	0.362	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
6:2 FTS	27619-97-2	ND	0.267	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFOA	335-67-1	1.41	0.275	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFHpS	375-92-8	ND	0.198	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFOS	1763-23-1	137	0.986	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFNA	375-95-1	0.489	0.208	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFDA	335-76-2	1.56	0.299	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
8:2 FTS	39108-34-4	ND	0.333	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFOSA	754-91-6	0.319	0.265	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
MeFOSAA	2355-31-9	ND	0.352	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFDS	335-77-3	1.81	0.235	1.17	2.33	J	B8E0193	23-May-18	0.970 g	31-May-18 01:22	1
PFUnA	2058-94-8	ND	0.413	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
EtFOSAA	2991-50-6	ND	0.375	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFDoA	307-55-1	0.543	0.322	1.17	2.33	J	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFTrDA	72629-94-8	ND	0.142	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFTeDA	376-06-7	ND	0.231	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFNS	68259-12-1	ND	1.67	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
PFPeS	2706-91-4	ND	0.986	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
4:2 FTS	757124-72-4	ND	0.986	1.17	2.33		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	30.4	50 - 150	H	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C3-PFPeA	IS	89.6	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C3-PFBS	IS	105	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C2-PFHxA	IS	96.2	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C4-PFHpA	IS	101	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
18O2-PFHxS	IS	91.5	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C2-PFOA	IS	88.7	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C8-PFOS	IS	99.9	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C5-PFNA	IS	91.3	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C2-PFDA	IS	95.1	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C8-PFOSA	IS	47.5	50 - 150	H	B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
d3-MeFOSAA	IS	83.6	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C2-PFUnA	IS	83.5	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1

Sample ID: CLIDU20200180501N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01

Matrix: Soil
Date Collected: 01-May-18 17:00

Laboratory Data

Lab Sample: 1800898-05
Date Received: 04-May-18 09:48
% Solids: 88.4

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	85.1	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C2-PFDoA	IS	76.9	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1
13C2-PFTeDA	IS	74.1	50 - 150		B8E0193	23-May-18	0.970 g	01-Jun-18 12:17	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CLIDU20300180501N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01

Matrix: Soil
Date Collected: 01-May-18 18:00

Laboratory Data

Lab Sample: 1800898-06
Date Received: 04-May-18 09:48
% Solids: 85.3

Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.572	0.171	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFPeA	2706-90-3	1.08	0.247	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFBS	375-73-5	ND	0.443	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFHxA	307-24-4	1.10	0.248	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFHpA	375-85-9	0.539	0.250	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFHxS	355-46-4	0.466	0.379	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
6:2 FTS	27619-97-2	ND	0.280	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFOA	335-67-1	1.65	0.288	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFHpS	375-92-8	ND	0.208	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFOS	1763-23-1	152	1.03	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFNA	375-95-1	0.552	0.217	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFDA	335-76-2	1.69	0.313	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
8:2 FTS	39108-34-4	ND	0.348	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFOSA	754-91-6	0.558	0.277	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
MeFOSAA	2355-31-9	0.469	0.369	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFDS	335-77-3	1.99	0.245	1.22	2.44	J	B8E0193	23-May-18	0.960 g	31-May-18 01:32	1
PFUnA	2058-94-8	0.466	0.432	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
EtFOSAA	2991-50-6	ND	0.392	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFDoA	307-55-1	0.567	0.337	1.22	2.44	J	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFTrDA	72629-94-8	ND	0.149	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFTeDA	376-06-7	ND	0.242	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFNS	68259-12-1	ND	1.75	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
PFPeS	2706-91-4	ND	1.03	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
4:2 FTS	757124-72-4	ND	1.03	1.22	2.44		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	41.1	50 - 150	H	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C3-PFPeA	IS	96.9	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C3-PFBS	IS	111	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C2-PFHxA	IS	97.7	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C4-PFHpA	IS	104	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
18O2-PFHxS	IS	89.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C2-PFOA	IS	93.9	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C8-PFOS	IS	94.9	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C5-PFNA	IS	96.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C2-PFDA	IS	96.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C8-PFOSA	IS	42.7	50 - 150	H	B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
d3-MeFOSAA	IS	81.2	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C2-PFUnA	IS	73.5	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1

Sample ID: CLIDU20300180501N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	01-May-18 18:00
Location:	08n10e33-CL01		

Laboratory Data

Lab Sample:	1800898-06	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	85.3		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	80.0	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C2-PFDoA	IS	87.4	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1
13C2-PFTeDA	IS	74.8	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 12:28	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CLIDU30100180502N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 02-May-18 18:25

Laboratory Data

Lab Sample: 1800898-07
Date Received: 04-May-18 09:48
% Solids: 84.9
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.558	0.168	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFPeA	2706-90-3	1.01	0.243	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFBS	375-73-5	ND	0.436	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFHxA	307-24-4	ND	0.244	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFHpA	375-85-9	0.578	0.246	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFHxS	355-46-4	ND	0.372	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
6:2 FTS	27619-97-2	ND	0.275	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFOA	335-67-1	1.47	0.284	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFHpS	375-92-8	ND	0.204	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFOS	1763-23-1	138	1.02	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFNA	375-95-1	0.633	0.214	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFDA	335-76-2	1.46	0.308	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
8:2 FTS	39108-34-4	ND	0.342	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFOSA	754-91-6	0.329	0.273	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
MeFOSAA	2355-31-9	ND	0.363	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFDS	335-77-3	1.55	0.242	1.20	2.40	J	B8E0193	23-May-18	0.980 g	31-May-18 01:43	1
PFUnA	2058-94-8	ND	0.425	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
EtFOSAA	2991-50-6	ND	0.386	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFDoA	307-55-1	0.816	0.332	1.20	2.40	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFTrDA	72629-94-8	ND	0.147	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFTeDA	376-06-7	ND	0.238	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFNS	68259-12-1	ND	1.72	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
PFPeS	2706-91-4	ND	1.02	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
4:2 FTS	757124-72-4	ND	1.02	1.20	2.40		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	89.5	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C3-PFPeA	IS	84.6	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C3-PFBS	IS	104	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C2-PFHxA	IS	91.1	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C4-PFHpA	IS	92.3	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
18O2-PFHxS	IS	93.6	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C2-PFOA	IS	85.2	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C8-PFOS	IS	91.5	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C5-PFNA	IS	89.2	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C2-PFDA	IS	91.0	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C8-PFOSA	IS	52.5	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
d3-MeFOSAA	IS	82.6	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C2-PFUnA	IS	93.3	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1

Sample ID: CLIDU30100180502N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01

Matrix: Soil
Date Collected: 02-May-18 18:25

Laboratory Data

Lab Sample: 1800898-07
Date Received: 04-May-18 09:48
% Solids: 84.9

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	111	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C2-PFDoA	IS	75.3	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1
13C2-PFTeDA	IS	89.3	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:38	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CLIDU30200180502N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 02-May-18 18:30

Laboratory Data

Lab Sample: 1800898-08
Date Received: 04-May-18 09:48
% Solids: 83.0
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.508	0.172	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFPeA	2706-90-3	0.912	0.248	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFBS	375-73-5	ND	0.446	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFHxA	307-24-4	1.02	0.250	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFHpA	375-85-9	0.596	0.252	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFHxS	355-46-4	ND	0.381	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
6:2 FTS	27619-97-2	ND	0.282	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFOA	335-67-1	1.83	0.290	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFHpS	375-92-8	ND	0.209	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFOS	1763-23-1	172	1.04	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFNA	375-95-1	0.644	0.219	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFDA	335-76-2	1.72	0.315	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
8:2 FTS	39108-34-4	ND	0.350	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFOSA	754-91-6	0.409	0.279	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
MeFOSAA	2355-31-9	0.380	0.371	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFDS	335-77-3	1.35	0.247	1.23	2.46	J	B8E0193	23-May-18	0.980 g	31-May-18 01:53	1
PFUnA	2058-94-8	0.438	0.435	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
EtFOSAA	2991-50-6	ND	0.395	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFDoA	307-55-1	0.648	0.339	1.23	2.46	J	B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFTrDA	72629-94-8	ND	0.150	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFTeDA	376-06-7	ND	0.243	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFNS	68259-12-1	ND	1.76	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
PFPeS	2706-91-4	ND	1.04	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
4:2 FTS	757124-72-4	ND	1.04	1.23	2.46		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.6	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C3-PFPeA	IS	93.6	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C3-PFBS	IS	106	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C2-PFHxA	IS	87.1	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C4-PFHpA	IS	98.9	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
18O2-PFHxS	IS	93.9	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C2-PFOA	IS	82.2	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C8-PFOS	IS	88.8	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C5-PFNA	IS	87.0	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C2-PFDA	IS	99.0	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C8-PFOSA	IS	60.0	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
d3-MeFOSAA	IS	91.1	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C2-PFUnA	IS	93.2	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1

Sample ID: CLIDU30200180502N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	02-May-18 18:30
Location:	08n10e33-CL01		

Laboratory Data

Lab Sample:	1800898-08	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	83.0		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	95.0	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C2-PFDoA	IS	94.9	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1
13C2-PFTeDA	IS	90.7	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 12:48	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CLIDU30300180502N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 02-May-18 18:35

Laboratory Data

Lab Sample: 1800898-09
Date Received: 04-May-18 09:48
% Solids: 85.3
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.518	0.176	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFPeA	2706-90-3	0.744	0.255	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFBS	375-73-5	ND	0.458	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFHxA	307-24-4	0.722	0.256	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFHpA	375-85-9	0.503	0.258	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFHxS	355-46-4	ND	0.391	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
6:2 FTS	27619-97-2	7.11	0.289	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFOA	335-67-1	1.28	0.297	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFHpS	375-92-8	ND	0.214	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFOS	1763-23-1	124	1.07	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFNA	375-95-1	0.592	0.224	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFDA	335-76-2	1.38	0.323	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
8:2 FTS	39108-34-4	ND	0.359	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFOSA	754-91-6	ND	0.286	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
MeFOSAA	2355-31-9	ND	0.381	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFDS	335-77-3	1.01	0.253	1.26	2.52	J	B8E0193	23-May-18	0.930 g	31-May-18 02:04	1
PFUnA	2058-94-8	ND	0.446	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
EtFOSAA	2991-50-6	ND	0.405	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFDoA	307-55-1	0.602	0.348	1.26	2.52	J	B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFTrDA	72629-94-8	ND	0.154	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFTeDA	376-06-7	ND	0.250	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFNS	68259-12-1	ND	1.80	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
PFPeS	2706-91-4	ND	1.07	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
4:2 FTS	757124-72-4	ND	1.07	1.26	2.52		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	89.8	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C3-PFPeA	IS	93.4	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C3-PFBS	IS	107	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C2-PFHxA	IS	92.8	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C4-PFHpA	IS	96.0	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
18O2-PFHxS	IS	86.8	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C2-PFOA	IS	84.8	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C8-PFOS	IS	81.7	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C5-PFNA	IS	72.6	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C2-PFDA	IS	83.0	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C8-PFOSA	IS	61.0	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
d3-MeFOSAA	IS	76.4	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C2-PFUnA	IS	84.8	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1

Sample ID: CLIDU30300180502N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n10e33-CL01
Matrix: Soil
Date Collected: 02-May-18 18:35

Laboratory Data

Lab Sample: 1800898-09
Date Received: 04-May-18 09:48
% Solids: 85.3
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	90.6	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C2-PFDoA	IS	76.8	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1
13C2-PFTeDA	IS	93.6	50 - 150		B8E0193	23-May-18	0.930 g	01-Jun-18 13:30	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU30100180426N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG01
Matrix: Soil
Date Collected: 26-Apr-18 15:30

Laboratory Data

Lab Sample: 1800898-10
Date Received: 04-May-18 09:48
% Solids: 90.3
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.220	0.146	1.04	2.09	J	B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFPeA	2706-90-3	ND	0.211	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFBS	375-73-5	ND	0.379	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFHxA	307-24-4	ND	0.212	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFHpA	375-85-9	ND	0.214	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFHxS	355-46-4	ND	0.324	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
6:2 FTS	27619-97-2	ND	0.239	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFOA	335-67-1	ND	0.246	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFHpS	375-92-8	ND	0.178	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFOS	1763-23-1	3.39	0.883	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFNA	375-95-1	ND	0.186	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFDA	335-76-2	ND	0.267	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
8:2 FTS	39108-34-4	ND	0.298	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFOSA	754-91-6	ND	0.237	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
MeFOSAA	2355-31-9	ND	0.315	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFDS	335-77-3	ND	0.210	1.04	2.09		B8E0193	23-May-18	1.06 g	31-May-18 02:45	1
PFUnA	2058-94-8	ND	0.370	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
EtFOSAA	2991-50-6	ND	0.335	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFDoA	307-55-1	ND	0.288	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFTrDA	72629-94-8	ND	0.127	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFTeDA	376-06-7	ND	0.207	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFNS	68259-12-1	ND	1.49	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
PFPeS	2706-91-4	ND	0.883	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
4:2 FTS	757124-72-4	ND	0.883	1.04	2.09		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.1	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C3-PFPeA	IS	89.1	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C3-PFBS	IS	106	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C2-PFHxA	IS	91.5	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C4-PFHpA	IS	89.1	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
18O2-PFHxS	IS	93.1	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C2-PFOA	IS	86.4	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C8-PFOS	IS	93.3	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C5-PFNA	IS	86.2	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C2-PFDA	IS	101	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C8-PFOSA	IS	54.6	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
d3-MeFOSAA	IS	78.0	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C2-PFUnA	IS	76.0	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1

Sample ID: TGIDU30100180426N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG01
Matrix: Soil
Date Collected: 26-Apr-18 15:30

Laboratory Data

Lab Sample: 1800898-10
Date Received: 04-May-18 09:48
% Solids: 90.3
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	85.2	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C2-PFDoA	IS	96.3	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1
13C2-PFTeDA	IS	81.6	50 - 150		B8E0193	23-May-18	1.06 g	01-Jun-18 13:41	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU30200180426N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG01

Matrix: Soil
Date Collected: 26-Apr-18 15:35

Laboratory Data

Lab Sample: 1800898-11
Date Received: 04-May-18 09:48
% Solids: 89.2

Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.332	0.155	1.11	2.22	J	B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFPeA	2706-90-3	0.242	0.224	1.11	2.22	J	B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFBS	375-73-5	ND	0.403	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFHxA	307-24-4	ND	0.225	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFHpA	375-85-9	ND	0.228	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFHxS	355-46-4	ND	0.344	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
6:2 FTS	27619-97-2	5.05	0.254	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFOA	335-67-1	ND	0.262	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFHpS	375-92-8	ND	0.189	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFOS	1763-23-1	12.3	0.938	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFNA	375-95-1	ND	0.198	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFDA	335-76-2	ND	0.284	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
8:2 FTS	39108-34-4	ND	0.316	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFOSA	754-91-6	ND	0.252	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
MeFOSAA	2355-31-9	ND	0.335	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFDS	335-77-3	ND	0.223	1.11	2.22		B8E0193	23-May-18	1.01 g	31-May-18 02:56	1
PFUnA	2058-94-8	ND	0.393	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
EtFOSAA	2991-50-6	ND	0.356	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFDoA	307-55-1	ND	0.306	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFTrDA	72629-94-8	ND	0.135	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFTeDA	376-06-7	ND	0.220	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFNS	68259-12-1	ND	1.59	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
PFPeS	2706-91-4	ND	0.938	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
4:2 FTS	757124-72-4	ND	0.938	1.11	2.22		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.2	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C3-PFPeA	IS	89.4	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C3-PFBS	IS	110	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C2-PFHxA	IS	95.3	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C4-PFHpA	IS	97.2	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
18O2-PFHxS	IS	94.0	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C2-PFOA	IS	80.1	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C8-PFOS	IS	97.3	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C5-PFNA	IS	78.9	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C2-PFDA	IS	86.1	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C8-PFOSA	IS	57.2	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
d3-MeFOSAA	IS	92.1	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C2-PFUnA	IS	72.8	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1

Sample ID: TGIDU30200180426N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	26-Apr-18 15:35
Location:	08n11e16-TG01		

Laboratory Data

Lab Sample:	1800898-11	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	89.2		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	99.7	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C2-PFDoA	IS	86.0	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1
13C2-PFTeDA	IS	89.7	50 - 150		B8E0193	23-May-18	1.01 g	01-Jun-18 13:51	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU30300180426N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG01
Matrix: Soil
Date Collected: 26-Apr-18 15:40

Laboratory Data

Lab Sample: 1800898-12
Date Received: 04-May-18 09:48
% Solids: 89.7
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.145	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFPeA	2706-90-3	ND	0.209	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFBS	375-73-5	ND	0.375	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFHxA	307-24-4	ND	0.210	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFHpA	375-85-9	ND	0.212	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFHxS	355-46-4	ND	0.320	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
6:2 FTS	27619-97-2	6.38	0.236	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFOA	335-67-1	ND	0.244	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFHpS	375-92-8	ND	0.176	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFOS	1763-23-1	2.31	0.873	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFNA	375-95-1	ND	0.184	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFDA	335-76-2	ND	0.264	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
8:2 FTS	39108-34-4	ND	0.294	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFOSA	754-91-6	ND	0.234	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
MeFOSAA	2355-31-9	ND	0.312	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFDS	335-77-3	ND	0.208	1.03	2.07		B8E0193	23-May-18	1.08 g	31-May-18 03:06	1
PFUnA	2058-94-8	ND	0.366	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
EtFOSAA	2991-50-6	ND	0.332	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFDoA	307-55-1	ND	0.285	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFTrDA	72629-94-8	ND	0.126	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFTeDA	376-06-7	ND	0.204	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFNS	68259-12-1	ND	1.48	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
PFPeS	2706-91-4	ND	0.873	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
4:2 FTS	757124-72-4	ND	0.873	1.03	2.07		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	92.0	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C3-PFPeA	IS	83.9	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C3-PFBS	IS	98.6	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C2-PFHxA	IS	89.9	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C4-PFHpA	IS	85.5	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
18O2-PFHxS	IS	101	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C2-PFOA	IS	84.3	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C8-PFOS	IS	89.6	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C5-PFNA	IS	89.4	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C2-PFDA	IS	98.1	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C8-PFOSA	IS	51.5	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
d3-MeFOSAA	IS	80.0	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C2-PFUnA	IS	83.4	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1

Sample ID: TGIDU30300180426N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG01
Matrix: Soil
Date Collected: 26-Apr-18 15:40

Laboratory Data

Lab Sample: 1800898-12
Date Received: 04-May-18 09:48
% Solids: 89.7
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	89.1	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C2-PFDoA	IS	98.7	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1
13C2-PFTeDA	IS	87.1	50 - 150		B8E0193	23-May-18	1.08 g	01-Jun-18 14:02	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU10200180427N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02

Matrix: Soil
Date Collected: 27-Apr-18 09:25

Laboratory Data

Lab Sample: 1800898-13
Date Received: 04-May-18 09:48
% Solids: 87.9

Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.322	0.166	1.19	2.37	J	B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFPeA	2706-90-3	0.284	0.239	1.19	2.37	J	B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFBS	375-73-5	ND	0.430	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFHxA	307-24-4	ND	0.241	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFHpA	375-85-9	ND	0.243	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFHxS	355-46-4	ND	0.367	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
6:2 FTS	27619-97-2	ND	0.271	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFOA	335-67-1	ND	0.280	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFHpS	375-92-8	ND	0.202	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFOS	1763-23-1	8.96	1.00	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFNA	375-95-1	ND	0.211	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFDA	335-76-2	ND	0.303	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
8:2 FTS	39108-34-4	ND	0.338	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFOSA	754-91-6	ND	0.269	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
MeFOSAA	2355-31-9	ND	0.358	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFDS	335-77-3	ND	0.238	1.19	2.37		B8E0193	23-May-18	0.960 g	31-May-18 03:17	1
PFUnA	2058-94-8	ND	0.420	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
EtFOSAA	2991-50-6	ND	0.380	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFDoA	307-55-1	ND	0.327	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFTrDA	72629-94-8	ND	0.145	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFTeDA	376-06-7	ND	0.235	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFNS	68259-12-1	ND	1.69	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
PFPeS	2706-91-4	ND	1.00	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
4:2 FTS	757124-72-4	ND	1.00	1.19	2.37		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	92.9	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C3-PFPeA	IS	87.4	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C3-PFBS	IS	107	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C2-PFHxA	IS	93.4	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C4-PFHpA	IS	88.6	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
18O2-PFHxS	IS	85.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C2-PFOA	IS	80.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C8-PFOS	IS	83.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C5-PFNA	IS	72.6	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C2-PFDA	IS	75.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C8-PFOSA	IS	56.8	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
d3-MeFOSAA	IS	80.8	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C2-PFUnA	IS	84.6	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1

Sample ID: TGIDU10200180427N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	27-Apr-18 09:25
Location:	08n11e16-TG02		

Laboratory Data

Lab Sample:	1800898-13	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	87.9		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	89.3	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C2-PFDoA	IS	78.0	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1
13C2-PFTeDA	IS	87.8	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:12	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU10300180427N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02
Matrix: Soil
Date Collected: 27-Apr-18 09:30

Laboratory Data

Lab Sample: 1800898-14
Date Received: 04-May-18 09:48
% Solids: 88.8
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.388	0.161	1.15	2.30	J	B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFPeA	2706-90-3	0.304	0.232	1.15	2.30	J	B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFBS	375-73-5	ND	0.417	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFHxA	307-24-4	0.419	0.233	1.15	2.30	J	B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFHpA	375-85-9	ND	0.236	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFHxS	355-46-4	ND	0.356	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
6:2 FTS	27619-97-2	ND	0.263	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFOA	335-67-1	ND	0.271	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFHpS	375-92-8	ND	0.195	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFOS	1763-23-1	13.6	0.971	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFNA	375-95-1	ND	0.205	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFDA	335-76-2	ND	0.294	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
8:2 FTS	39108-34-4	ND	0.327	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFOSA	754-91-6	ND	0.261	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
MeFOSAA	2355-31-9	ND	0.347	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFDS	335-77-3	ND	0.231	1.15	2.30		B8E0193	23-May-18	0.980 g	31-May-18 03:27	1
PFUnA	2058-94-8	ND	0.407	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
EtFOSAA	2991-50-6	ND	0.369	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFDoA	307-55-1	ND	0.317	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFTrDA	72629-94-8	ND	0.140	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFTeDA	376-06-7	ND	0.228	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFNS	68259-12-1	ND	1.64	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
PFPeS	2706-91-4	ND	0.971	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
4:2 FTS	757124-72-4	ND	0.971	1.15	2.30		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.7	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C3-PFPeA	IS	87.4	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C3-PFBS	IS	104	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C2-PFHxA	IS	92.5	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C4-PFHpA	IS	93.7	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
18O2-PFHxS	IS	93.3	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C2-PFOA	IS	82.9	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C8-PFOS	IS	89.9	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C5-PFNA	IS	80.0	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C2-PFDA	IS	88.7	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C8-PFOSA	IS	63.1	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
d3-MeFOSAA	IS	96.9	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C2-PFUnA	IS	103	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1

Sample ID: TGIDU10300180427N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	27-Apr-18 09:30
Location:	08n11e16-TG02		

Laboratory Data

Lab Sample:	1800898-14	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	88.8		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	105	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C2-PFDoA	IS	81.3	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1
13C2-PFTeDA	IS	106	50 - 150		B8E0193	23-May-18	0.980 g	01-Jun-18 14:23	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU10100180426N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02
Matrix: Soil
Date Collected: 26-Apr-18 17:15

Laboratory Data

Lab Sample: 1800898-15
Date Received: 04-May-18 09:48
% Solids: 89.2
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.277	0.164	1.17	2.34	J	B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFPeA	2706-90-3	0.237	0.236	1.17	2.34	J	B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFBS	375-73-5	ND	0.424	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFHxA	307-24-4	ND	0.237	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFHpA	375-85-9	ND	0.239	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFHxS	355-46-4	ND	0.362	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
6:2 FTS	27619-97-2	ND	0.268	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFOA	335-67-1	ND	0.276	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFHpS	375-92-8	ND	0.199	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFOS	1763-23-1	5.45	0.987	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFNA	375-95-1	ND	0.208	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFDA	335-76-2	ND	0.299	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
8:2 FTS	39108-34-4	ND	0.333	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFOSA	754-91-6	ND	0.265	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
MeFOSAA	2355-31-9	ND	0.353	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFDS	335-77-3	ND	0.235	1.17	2.34		B8E0193	23-May-18	0.960 g	31-May-18 03:38	1
PFUnA	2058-94-8	ND	0.414	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
EtFOSAA	2991-50-6	ND	0.375	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFDoA	307-55-1	ND	0.322	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFTrDA	72629-94-8	ND	0.143	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFTeDA	376-06-7	ND	0.231	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFNS	68259-12-1	ND	1.67	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
PFPeS	2706-91-4	ND	0.987	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
4:2 FTS	757124-72-4	ND	0.987	1.17	2.34		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.4	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C3-PFPeA	IS	88.7	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C3-PFBS	IS	105	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C2-PFHxA	IS	95.2	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C4-PFHpA	IS	96.8	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
18O2-PFHxS	IS	94.3	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C2-PFOA	IS	85.4	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C8-PFOS	IS	96.9	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C5-PFNA	IS	76.9	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C2-PFDA	IS	90.8	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C8-PFOSA	IS	53.8	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
d3-MeFOSAA	IS	75.9	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C2-PFUnA	IS	87.2	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1

Sample ID: TGIDU10100180426N

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	26-Apr-18 17:15
Location:	08n11e16-TG02		

Laboratory Data

Lab Sample:	1800898-15	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	89.2		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	91.2	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C2-PFDoA	IS	95.5	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1
13C2-PFTeDA	IS	92.1	50 - 150		B8E0193	23-May-18	0.960 g	01-Jun-18 14:33	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU20100180430N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02
Matrix: Soil
Date Collected: 30-Apr-18 18:35

Laboratory Data

Lab Sample: 1800898-16
Date Received: 04-May-18 09:48
% Solids: 90.5
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.292	0.155	1.10	2.21	J	B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFPeA	2706-90-3	0.254	0.223	1.10	2.21	J	B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFBS	375-73-5	ND	0.401	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFHxA	307-24-4	0.402	0.224	1.10	2.21	J	B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFHpA	375-85-9	ND	0.227	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFHxS	355-46-4	ND	0.343	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
6:2 FTS	27619-97-2	7.67	0.253	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFOA	335-67-1	ND	0.261	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFHpS	375-92-8	ND	0.188	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFOS	1763-23-1	13.6	0.934	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFNA	375-95-1	ND	0.197	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFDA	335-76-2	ND	0.283	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
8:2 FTS	39108-34-4	ND	0.315	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFOSA	754-91-6	ND	0.251	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
MeFOSAA	2355-31-9	ND	0.334	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFDS	335-77-3	ND	0.222	1.10	2.21		B8E0193	23-May-18	1.00 g	31-May-18 03:48	1
PFUnA	2058-94-8	ND	0.391	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
EtFOSAA	2991-50-6	ND	0.355	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFDoA	307-55-1	ND	0.305	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFTrDA	72629-94-8	ND	0.135	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFTeDA	376-06-7	ND	0.219	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFNS	68259-12-1	ND	1.58	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
PFPeS	2706-91-4	ND	0.934	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
4:2 FTS	757124-72-4	ND	0.934	1.10	2.21		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.4	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C3-PFPeA	IS	93.7	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C3-PFBS	IS	102	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C2-PFHxA	IS	86.3	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C4-PFHpA	IS	96.4	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
18O2-PFHxS	IS	99.2	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C2-PFOA	IS	86.2	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C8-PFOS	IS	102	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C5-PFNA	IS	89.3	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C2-PFDA	IS	83.8	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C8-PFOSA	IS	55.4	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
d3-MeFOSAA	IS	78.6	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C2-PFUnA	IS	82.6	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1

Sample ID: TGIDU20100180430N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02

Matrix: Soil
Date Collected: 30-Apr-18 18:35

Laboratory Data

Lab Sample: 1800898-16
Date Received: 04-May-18 09:48
% Solids: 90.5

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	79.9	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C2-PFDoA	IS	86.6	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1
13C2-PFTeDA	IS	88.1	50 - 150		B8E0193	23-May-18	1.00 g	01-Jun-18 14:44	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU20200180430N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02
Matrix: Soil
Date Collected: 30-Apr-18 18:40

Laboratory Data

Lab Sample: 1800898-17
Date Received: 04-May-18 09:48
% Solids: 91.1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.198	0.148	1.06	2.11	J	B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFPeA	2706-90-3	ND	0.213	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFBS	375-73-5	ND	0.383	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFHxA	307-24-4	ND	0.214	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFHpA	375-85-9	ND	0.216	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFHxS	355-46-4	ND	0.327	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
6:2 FTS	27619-97-2	7.95	0.242	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFOA	335-67-1	ND	0.249	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFHpS	375-92-8	ND	0.180	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFOS	1763-23-1	4.71	0.892	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFNA	375-95-1	ND	0.188	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFDA	335-76-2	ND	0.270	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
8:2 FTS	39108-34-4	ND	0.301	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFOSA	754-91-6	ND	0.240	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
MeFOSAA	2355-31-9	ND	0.319	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFDS	335-77-3	ND	0.212	1.06	2.11		B8E0193	23-May-18	1.04 g	31-May-18 03:59	1
PFUnA	2058-94-8	ND	0.374	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
EtFOSAA	2991-50-6	ND	0.339	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFDoA	307-55-1	ND	0.291	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFTrDA	72629-94-8	ND	0.129	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFTeDA	376-06-7	ND	0.209	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFNS	68259-12-1	ND	1.51	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
PFPeS	2706-91-4	ND	0.892	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
4:2 FTS	757124-72-4	ND	0.892	1.06	2.11		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.9	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C3-PFPeA	IS	91.7	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C3-PFBS	IS	109	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C2-PFHxA	IS	94.0	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C4-PFHpA	IS	89.3	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
18O2-PFHxS	IS	98.6	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C2-PFOA	IS	83.3	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C8-PFOS	IS	93.1	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C5-PFNA	IS	79.7	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C2-PFDA	IS	87.8	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C8-PFOSA	IS	56.7	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
d3-MeFOSAA	IS	89.9	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C2-PFUnA	IS	68.7	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1

Sample ID: TGIDU20200180430N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02
Matrix: Soil
Date Collected: 30-Apr-18 18:40

Laboratory Data

Lab Sample: 1800898-17
Date Received: 04-May-18 09:48
% Solids: 91.1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	92.4	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C2-PFDoA	IS	96.1	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1
13C2-PFTeDA	IS	94.1	50 - 150		B8E0193	23-May-18	1.04 g	01-Jun-18 14:54	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: TGIDU20300180430N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer Sampling
Location: 08n11e16-TG02

Matrix: Soil
Date Collected: 30-Apr-18 18:45

Laboratory Data

Lab Sample: 1800898-18
Date Received: 04-May-18 09:48
% Solids: 91.4

Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	0.183	0.137	0.977	1.95	J	B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFPeA	2706-90-3	ND	0.197	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFBS	375-73-5	ND	0.355	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFHxA	307-24-4	ND	0.198	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFHpA	375-85-9	ND	0.200	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFHxS	355-46-4	ND	0.303	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
6:2 FTS	27619-97-2	ND	0.224	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFOA	335-67-1	ND	0.231	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFHpS	375-92-8	ND	0.166	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFOS	1763-23-1	3.12	0.826	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFNA	375-95-1	ND	0.174	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFDA	335-76-2	ND	0.250	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
8:2 FTS	39108-34-4	ND	0.279	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFOSA	754-91-6	ND	0.222	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
MeFOSAA	2355-31-9	ND	0.295	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFDS	335-77-3	ND	0.196	0.977	1.95		B8E0193	23-May-18	1.12 g	31-May-18 04:09	1
PFUnA	2058-94-8	ND	0.346	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
EtFOSAA	2991-50-6	ND	0.314	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFDoA	307-55-1	ND	0.270	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFTrDA	72629-94-8	ND	0.119	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFTeDA	376-06-7	ND	0.194	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFNS	68259-12-1	ND	1.40	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
PFPeS	2706-91-4	ND	0.826	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
4:2 FTS	757124-72-4	ND	0.826	0.977	1.95		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.5	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C3-PFPeA	IS	86.9	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C3-PFBS	IS	99.7	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C2-PFHxA	IS	90.9	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C4-PFHpA	IS	90.7	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
18O2-PFHxS	IS	85.9	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C2-PFOA	IS	78.3	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C8-PFOS	IS	98.5	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C5-PFNA	IS	87.3	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C2-PFDA	IS	87.3	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C8-PFOSA	IS	54.3	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
d3-MeFOSAA	IS	83.5	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C2-PFUnA	IS	78.2	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1

Sample ID: TGIDU20300180430N **VAL - PFAS**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Soil
Project:	Lapeer Sampling	Date Collected:	30-Apr-18 18:45
Location:	08n11e16-TG02		

Laboratory Data

Lab Sample:	1800898-18	Column:	BEH C18
Date Received:	04-May-18 09:48		
% Solids:	91.4		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
d5-EtFOSAA	IS	87.2	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C2-PFDoA	IS	91.8	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1
13C2-PFTeDA	IS	86.9	50 - 150		B8E0193	23-May-18	1.12 g	01-Jun-18 15:04	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS 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**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
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.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
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.

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800898 Temp: 1.5/2.2 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Lapeer PFAS Biosolids Investigation** PO#: **60570635** Sampler: **Stan Krenz** (name)

TAT (check one): Standard: [x] 21 days; 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
Dorin Bogdan	5/16/2018	17:30			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Container(s) | PFAS Isotope Dilution | USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
CL1DU10100180501N	5/1/18	1030	08n10e33-CL01	3	P	SO			X							ISM
CL1DU10300180501N	5/1/18	1200	08n10e33-CL01	3	P	SO			X							ISM
CL1DU10200180501N	5/1/18	1230	08n10e33-CL01	3	P	SO			X							ISM
CL1DU20100180501N	5/1/18	1500	08n10e33-CL01	3	P	SO			X							ISM
CL1DU20200180501N	5/1/18	1700	08n10e33-CL01	3	P	SO			X							ISM
CL1DU20300180501N	5/1/18	1800	08n10e33-CL01	3	P	SO			X							ISM
CL1DU30100180502N	5/2/18	1825	08n10e33-CL01	3	P	SO			X							ISM
CL1DU30200180502N	5/2/18	1830	08n10e33-CL01	3	P	SO			X							ISM
CL1DU30300180502N	5/2/18	1835	08n10e33-CL01	3	P	SO			X							ISM

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Revised COC - received from Dorin Bogdan 5/17/18 (jw)

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800898 Temp: 1.5/2.2 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Lapeer PFAS Biosolids Investigation** PO#: **60570635** Sampler: **Stan Krenz** (name)

TAT (check one): Standard: [x] 21 days; 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
Dorin Bogdan	5/16/2018	17:30			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

Method of Shipment: FED EX

ATTN: Jennifer Miller

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
TG1DU30100180426N	4/26/18	1530	08n11e16-TG01	3	P	SO			X							ISM
TG1DU30200180426N	4/26/18	1535	08n11e16-TG01	3	P	SO			X							ISM
TG1DU30300180426N	4/26/18	1540	08n11e16-TG01	3	P	SO			X							ISM
TG1DU10100180426N	4/26/18	1715	08n11e16-TG02	3	P	SO			X							ISM
TG1DU10200180427N	4/27/18	0925	08n11e16-TG02	3	P	SO			X							ISM
TG1DU10300180427N	4/27/18	0930	08n11e16-TG02	3	P	SO			X							ISM
TG1DU20100180430N	4/30/18	1835	08n11e16-TG02	3	P	SO			X							ISM
TG1DU20200180430N	4/30/18	1840	08n11e16-TG02	3	P	SO			X							ISM
TG1DU20300180430N	4/30/18	1845	08n11e16-TG02	3	P	SO			X							ISM

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Revised COC - received from Dorin Bogdan 5/17/18 dw

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800898
Storage ID: WR-2
Temp: 2.2 °C 1.5°C KE 05/08/18
Storage Secured: Yes ☑ No ☐

TAT (check one): Standard: [x] 21 days; Rush (surcharge may apply): [ ] 14 days [ ] 7 days Specify:

Project ID: LAPEER SAMPLING PO#: 60570309 Sampler: John Yanchula (name)

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
JOHN YANCHULA Jm Yanchula	5/3/18	1830	FED EX		
FED EX			KIM ERIC	05/04/18	10:14

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537 PFOA/PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
CLIDU1Φ1ΦΦ18Φ5Φ1N	5/1/18	1030	LAPEER	3		S			X							
CLIDU1Φ3ΦΦ18Φ5Φ1N	5/1/18	1200	LAPEER	3		S			X							
CLIDU1Φ2ΦΦ18Φ5Φ1N	5/1/18	1230	LAPEER	3		S			X							
CLIDU2Φ1ΦΦ18Φ5Φ1N	5/1/18	1500	LAPEER	3		S			X							
CLIDU2Φ2ΦΦ18Φ5Φ1N	5/1/18	1700	LAPEER	3		S			X							
CLIDU2Φ3ΦΦ18Φ5Φ1N	5/1/18	1800	LAPEER	3		S			X							
CLIDU3Φ1ΦΦ18Φ5Φ2N	5/2/18	1825	LAPEER	3		S			X							
CLIDU3Φ2ΦΦ18Φ5Φ2N	5/2/18	1830	LAPEER	3		S			X							
CLIDU3Φ3ΦΦ18Φ5Φ2N	5/2/18	1835	LAPEER	3		S			X							

Special Instructions/Comments: Send Results and Acknowledgements to the list provided by e-mail to Vista.

SEND DOCUMENTATION AND RESULTS TO:

Name: Stephanie Kammer
Company: MDEQ
Address: 525 W. Allegan Stree
City: Lansing State: MI Zip: 48909
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

KE 05/08/18

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800898 Temp: 1.5/2.2 °C
Storage ID: WR22 Storage Secured: Yes ☑ No ☐

Project ID: **LAPEER SAMPLING** PO#: **60570309** Sampler: **John Yanchula** (name)

TAT (check one): Standard: [x] 21 days; Rush (surcharge may apply): [ ] 14 days [ ] 7 days Specify:

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
John YANCHULA John Yanchula	5/3/18	1830	FED EX		
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
FED EX →			KIM EURIC	05/4/18	1014

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Container(s)

PFAS Isotope Dilution

USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
TGIDU3Φ1ΦΦ18Φ426N	4/26/18	1530	LAPEER	3		S			X							
TGIDU3Φ2ΦΦ18Φ426N	4/26/18	1535	LAPEER	3		S			X							
TGIDU3Φ3ΦΦ18Φ426N	4/26/18	1540	LAPEER	3		S			X							
TGIDU1Φ2ΦΦ18Φ427N	4/27/18	0925	LAPEER	3		S			X							
TGIDU1Φ3ΦΦ18Φ427N	4/27/18	0930	LAPEER	3		S			X							
TGIDU1Φ1ΦΦ18Φ426N	4/26/18	1715	LAPEER	3		S			X							
TGIDU2Φ1ΦΦ18Φ430N	4/30/18	1835	LAPEER	3		S			X							
TGIDU2Φ1ΦΦ18Φ430N	4/30/18	1840	LAPEER	3		S			X							
TGIDU2Φ1ΦΦ18Φ430N	4/30/18	1845	LAPEER	3		S			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Stree**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800898 **TAT** STD

Samples Arrival:	**Date/Time** 05/04/18 0948	**Initials:** KE	**Location:** WR-2 **Shelf/Rack:** N/A
Logged In:	**Date/Time** 05/08/18 0859	**Initials:** JW	**Location:** WR-2 **Shelf/Rack:** A-5

Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None

Temp °C: 1.6	(uncorrected)	**Time:** 1022	**Thermometer ID:** IR-4
Temp °C: 1.5	(corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill 2 of 3 Trk # 7808 1407 5849	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present? KE 05/04/18	✓		
COC Anomaly/Sample Acceptance Form completed?	✓		

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$	Trizma	None	Yes	No	NA
Shipping Container	Vista	Client	Retain	Return	Dispose	

Comments:

CLIDW10100180501N
CLIDW10300180501N
CLIDW10200180501N
CLIDW20100180501N
CLIDW20200180501N
CLIDW20300180501N

CLIDW30100180502N
CLIDW30200180502N
CLIDW30300180502N
TGIDW30100180426N
TGIDW30200180426N
TGIDW30300180426N

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800898 **TAT** Std.

Samples Arrival:	**Date/Time** 05/04/18 0948	**Initials:** KG	**Location:** WR-2 **Shelf/Rack:** N/A
Logged In:	**Date/Time** 05/08/18 0859	**Initials:** dw	**Location:** WR-2 **Shelf/Rack:** A-5

Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice	Blue Ice	Dry Ice	None		
Temp °C: 2.3 (uncorrected) **Temp °C:** 2.2 (corrected)	**Time:** 1033 **Probe used:** Yes☐ No☑	**Thermometer ID:** IR-4				

	YES	NO	NA
Adequate Sample Volume Received?	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?			✓
Shipping Documentation Present?	✓		
Airbill 3 of 3 Trk # 7808 1407 5850	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?		✓	
COC Anomaly/Sample Acceptance Form completed?	✓		

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$	Trizma	None	Yes	No	NA
Shipping Container	Vista	Client	Retain	Return	Dispose	

Comments:

TGIDU1010018
TGIDU1020018
TGIDU1030018
TGIDU2010018043ON
TGIDU2020018043ON
TGIDU2030018043ON

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Merit Laboratories, Inc.
Maya Murshak
mayamurshak@meritlabs.com
(517) 827-2744

Workorder Number: 1800898
Date Received: 04-May-18 09:48
Documented by/date: Kim Elric 05/08/18

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

[X] Sample IDs on Chain of Custody do not match Sample Container Labels

Chain of Custody ID	Container Label ID
CLIDU10100180501N	CLIDU10100180501N
CLIDU10300180501N	CLIDU10300180501N
CLIDU10200180501N	CLIDU10200180501N
CLIDU20100180501N	CLIDU20100180501N
CLIDU20200180501N	CLIDU20200180501N
CLIDU20300180501N	CLIDU20300180501N
CLIDU30100180502N	CLIDU30100180502N
CLIDU30200180502N	CLIDU30200180502N
CLIDU30300180502N	CLIDU30300180502N
TGIDU30100180426N	TGIDU30100180426N
TGIDU30200180426N	TGIDU30200180426N
TGIDU30300180426N	TGIDU30300180426N
TGIDU10200180427N	TGIDU10200180427N
TGIDU10300180427N	TGIDU10300180427N
TGIDU10100180426N	TGIDU10100180426N
TGIDU20100180430N	TGIDU20100180430N
*TGIDU20100180430N	TGIDU20200180430N
*TGIDU20100180430N	TGIDU20300180430N

Client Authorization

Proceed with Analysis: (YES) NO Signature and Date [signature] 5/16/18

Client Comments/Instructions Per Doris Bogdan via email use sample ID as listed on container label.

June 27, 2018

Vista Work Order No. 1800935

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 May 12, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'Lapeer'.

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.

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

Sincerely,

Martha Maier
Laboratory Director

Vista Work Order No. 1800935
Case Narrative

Sample Condition on Receipt:

One effluent sample, two sludge samples and two wastewater 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:

As requested, sample "CL1CS0100180509N" was centrifuged and the aqueous and solid phases extracted and analyzed separately. The solid phase has been reported as Lab Sample 1800935-06.

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 Modifed 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.

Subsamples of "CL1CW0100180509N" and "CL1MH0100180509N" were extracted due to the appearance of the samples. The Solid Phase Extraction cartridge clogged during the extraction of sample "CL1CS0100180509N" and an additional cartridge was used to complete the extraction. Sample "CL1MH0100180509N" was eluted under vacuum.

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 listed in the table below.

VAL-PFAS

Sample "CL1MC0100180509N" and the solid phase of sample "CL1CS0100180509N" 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.

Sample "CL1MC0100180509N" built up pressure during storage and immediately expanded upon removing the lid. The sample was transferred to a large pan and homogenized prior to removing an aliquot for extraction.

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 each preparation batch. In prep batch B8F0074, a concentration of 1.99 ng/g of 6:2 FTS was detected in the Method Blank. No other analytes were detected in the Method Blank above 1/2 of the LOQ concentrations. The recoveries of 6:2 FTS and MeFOSAA were 134% and 69.5% in the OPR. A concentration of 562 ng/g of 6:2 FTS was detected in the sample, which is greater than 10X the level detected in the Method Blank; the background concentration did not signifcantly affect the sample results. The recoveries of all other analytes within the method acceptance criteria. The sample was extracted twice, with similar results.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with preparation batch B8F0153. No analytes were detected in the Method Blank above 1/2 the LOQ. The recoveries of PFHpS 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 labeled standard recoveries outside the acceptance criteria are listed in the table below.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1800935-01	WWTPEF0100180509N	PFAS Isotope Dilution Method	13C2-PFTeDA	H	49.1
1800935-02	WWTPSL0100180509N	PFAS Isotope Dilution Method	13C2-PFTeDA	H	35.4
1800935-04	WWTPWW0100180509N	PFAS Isotope Dilution Method	13C2-PFTeDA	H	27.5
1800935-05	WWTPSL0100180509N	VAL - PFAS	13C2-PFTeDA	H	40.8
1800935-06	WWTPSL0100180509N	VAL - PFAS	d3-MeFOSAA	H	39.2
1800935-06	WWTPSL0100180509N	VAL - PFAS	d5-EtFOSAA	H	43.4
B8E0190-BLK1	B8E0190-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	40.1
B8E0190-BS1	B8E0190-BS1	PFAS Isotope Dilution Method	13C8-PFOSA	H	42.0
B8F0074-BLK1	B8F0074-BLK1	VAL - PFAS	13C8-PFOSA	H	37.3
B8F0074-BS1	B8F0074-BS1	VAL - PFAS	13C8-PFOSA	H	35.8
B8F0153-BLK1	B8F0153-BLK1	VAL - PFAS	13C8-PFOSA	H	45.7
B8F0153-BS1	B8F0153-BS1	VAL - PFAS	13C8-PFOSA	H	46.2

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800935-01	WWTPEF0100180509N WWTPEF0100180509N WWTPEF0100180509N	Effluent Sample 09-May-18 11:10	12-May-18 09:57	HDPE Bottle, 250 mL HDPE Bottle, 250 mL
1800935-02	WWTPSL0100180509N	Centrifuge - SLUDGE 09-May-18 11:35	12-May-18 09:57	HDPE Bottle, 250 mL HDPE Bottle, 250 mL
1800935-03	WWTPWW0100180509N	Centrifuge - Wastewater 09-May-18 11:40	12-May-18 09:57	HDPE Bottle, 250 mL HDPE Bottle, 250 mL
1800935-04	WWTPWW0100180509N	Man Hole near mixing cell - Wastewater 09-May-18 12:00	12-May-18 09:57	HDPE Bottle, 250 mL HDPE Bottle, 250 mL
1800935-05	WWTPSL0100180509N	Mixing Cell - SLUDGE 09-May-18 12:10	12-May-18 09:57	HDPE Bottle, 250 mL HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0190-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	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFPeA	2706-90-3	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFBS	375-73-5	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
4:2 FTS	757124-72-4	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFHxA	307-24-4	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFPeS	2706-91-4	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFHpA	375-85-9	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFHxS	355-46-4	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
6:2 FTS	27619-97-2	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFOA	335-67-1	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFHpS	375-92-8	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFNA	375-95-1	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFOSA	754-91-6	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFOS	1763-23-1	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFDA	335-76-2	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
8:2 FTS	39108-34-4	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFNS	68259-12-1	ND	0.715	0.750	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
MeFOSAA	2355-31-9	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
EtFOSAA	2991-50-6	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFUnA	2058-94-8	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFDS	335-77-3	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFDoA	307-55-1	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFTrDA	72629-94-8	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
PFTeDA	376-06-7	ND	0.423	0.500	1.00		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.6	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C3-PFPeA	IS	95.4	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C3-PFBS	IS	105	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-4:2 FTS	IS	96.3	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-PFHxA	IS	93.0	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C4-PFHpA	IS	98.1	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
18O2-PFHxS	IS	97.3	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-6:2 FTS	IS	87.3	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-PFOA	IS	87.2	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C5-PFNA	IS	96.2	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C8-PFOSA	IS	40.1	50 - 150	H	B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C8-PFOS	IS	93.3	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-PFDA	IS	73.0	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Lapeer

Laboratory Data

Lab Sample: B8E0190-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	84.2	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
d3-MeFOSAA	IS	68.7	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
d5-EtFOSAA	IS	65.8	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-PFUnA	IS	67.6	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-PFDoA	IS	53.5	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	1
13C2-PFTeDA	IS	60.1	50 - 150		B8E0190	23-May-18	0.250 L	30-May-18 06:28	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

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0190-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	40.7	40.0	102	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFPeA	2706-90-3	39.8	40.0	99.5	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFBS	375-73-5	39.5	40.0	98.7	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
4:2 FTS	757124-72-4	38.1	40.0	95.2	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFHxA	307-24-4	39.5	40.0	98.8	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFPeS	2706-91-4	39.9	40.0	99.6	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFHpA	375-85-9	40.2	40.0	101	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFHxS	355-46-4	46.1	40.0	115	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
6:2 FTS	27619-97-2	43.2	40.0	108	60 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFOA	335-67-1	43.0	40.0	108	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFHpS	375-92-8	43.7	40.0	109	60 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFNA	375-95-1	44.6	40.0	112	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFOSA	754-91-6	37.8	40.0	94.5	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFOS	1763-23-1	36.6	40.0	91.5	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFDA	335-76-2	45.7	40.0	114	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
8:2 FTS	39108-34-4	41.4	40.0	104	60 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFNS	68259-12-1	35.2	40.0	87.9	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
MeFOSAA	2355-31-9	32.5	40.0	81.2	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
EtFOSAA	2991-50-6	35.3	40.0	88.3	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFUnA	2058-94-8	41.4	40.0	103	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFDS	335-77-3	40.5	40.0	101	60 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFDoA	307-55-1	42.2	40.0	105	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFTrDA	72629-94-8	42.3	40.0	106	60 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
PFTeDA	376-06-7	47.3	40.0	118	70 - 130		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.1	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C3-PFPeA	IS	97.6	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C3-PFBS	IS	108	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-4:2 FTS	IS	93.5	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-PFHxA	IS	93.8	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C4-PFHpA	IS	104	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
18O2-PFHxS	IS	98.1	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-6:2 FTS	IS	81.3	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-PFOA	IS	82.7	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C5-PFNA	IS	67.9	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0190-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	42.0	50- 150	H	B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C8-PFOS	IS	99.0	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-PFDA	IS	78.3	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-8:2 FTS	IS	84.9	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
d3-MeFOSAA	IS	80.1	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
d5-EtFOSAA	IS	79.0	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-PFUnA	IS	79.7	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-PFDoA	IS	73.4	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1
13C2-PFTeDA	IS	67.7	50- 150		B8E0190	23-May-18	0.250 L	30-May-18 06:18	1

Sample ID: WWTPEF0100180509N — **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-EFF
Matrix: Effluent
Date Collected: 09-May-18 15:05

Laboratory Data

Lab Sample: 1800935-01
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	29.3	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFPeA	2706-90-3	81.4	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFBS	375-73-5	7.46	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
4:2 FTS	757124-72-4	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFHxA	307-24-4	90.8	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFPeS	2706-91-4	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFHpA	375-85-9	122	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFHxS	355-46-4	1.32	1.32	1.93	3.86	J	B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
6:2 FTS	27619-97-2	8.13	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFOA	335-67-1	5.03	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFHpS	375-92-8	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFNA	375-95-1	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFOSA	754-91-6	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFOS	1763-23-1	28.7	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFDA	335-76-2	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
8:2 FTS	39108-34-4	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFNS	68259-12-1	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
MeFOSAA	2355-31-9	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
EtFOSAA	2991-50-6	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFUnA	2058-94-8	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFDS	335-77-3	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFDoA	307-55-1	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFTrDA	72629-94-8	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
PFTeDA	376-06-7	ND	1.32	1.93	3.86		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	102	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C3-PFPeA	IS	101	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C3-PFBS	IS	119	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-4:2 FTS	IS	95.4	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-PFHxA	IS	98.1	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C4-PFHpA	IS	114	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
18O2-PFHxS	IS	96.6	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-6:2 FTS	IS	81.6	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-PFOA	IS	92.9	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C5-PFNA	IS	87.7	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C8-PFOSA	IS	54.0	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C8-PFOS	IS	112	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-PFDA	IS	89.0	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1

Sample ID: WWTPEF0100180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-EFF
Matrix: Effluent
Date Collected: 09-May-18 15:05

Laboratory Data

Lab Sample: 1800935-01
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	95.0	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
d3-MeFOSAA	IS	82.9	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
d5-EtFOSAA	IS	92.8	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-PFUnA	IS	69.1	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-PFDoA	IS	72.5	50 - 150		B8E0190	23-May-18	0.259 L	30-May-18 06:39	1
13C2-PFTeDA	IS	49.1	50 - 150	H	B8E0190	23-May-18	0.259 L	30-May-18 06:39	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: WWTPSL0100180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-Centrifuge
Matrix: Sludge
Date Collected: 09-May-18 15:45

Laboratory Data

Lab Sample: 1800935-02
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	141	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFPeA	2706-90-3	275	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFBS	375-73-5	12.1	9.39	13.7	27.4	J	B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
4:2 FTS	757124-72-4	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFHxA	307-24-4	462	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFPeS	2706-91-4	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFHpA	375-85-9	415	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFHxS	355-46-4	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
6:2 FTS	27619-97-2	102	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFOA	335-67-1	55.7	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFHpS	375-92-8	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFNA	375-95-1	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFOSA	754-91-6	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFOS	1763-23-1	182	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFDA	335-76-2	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
8:2 FTS	39108-34-4	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFNS	68259-12-1	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
MeFOSAA	2355-31-9	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
EtFOSAA	2991-50-6	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFUnA	2058-94-8	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFDS	335-77-3	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFDoA	307-55-1	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFTrDA	72629-94-8	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
PFTeDA	376-06-7	ND	9.39	13.7	27.4		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	99.3	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C3-PFPeA	IS	96.3	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C3-PFBS	IS	104	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-4:2 FTS	IS	95.1	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-PFHxA	IS	91.5	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C4-PFHpA	IS	101	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
18O2-PFHxS	IS	89.9	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-6:2 FTS	IS	90.4	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-PFOA	IS	82.4	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C5-PFNA	IS	81.5	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C8-PFOSA	IS	58.9	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C8-PFOS	IS	75.6	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-PFDA	IS	70.0	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1

Sample ID: WWTPSL0100180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-Centrifuge
Matrix: Sludge
Date Collected: 09-May-18 15:45

Laboratory Data

Lab Sample: 1800935-02
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	78.6	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
d3-MeFOSAA	IS	60.0	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
d5-EtFOSAA	IS	67.7	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-PFUnA	IS	70.2	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-PFDoA	IS	54.5	50 - 150		B8E0190	23-May-18	0.0365 L	30-May-18 06:49	1
13C2-PFTeDA	IS	35.4	50 - 150	H	B8E0190	23-May-18	0.0365 L	30-May-18 06:49	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: WWTPWW0100180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-Centrifuge
Matrix: Wastewater
Date Collected: 09-May-18 16:15

Laboratory Data

Lab Sample: 1800935-03
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	39.5	17.0	24.9	49.8	J	B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFPeA	2706-90-3	134	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFBS	375-73-5	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
4:2 FTS	757124-72-4	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFHxA	307-24-4	204	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFPeS	2706-91-4	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFHpA	375-85-9	171	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFHxS	355-46-4	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
6:2 FTS	27619-97-2	269	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFOA	335-67-1	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFHpS	375-92-8	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFNA	375-95-1	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFOSA	754-91-6	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFOS	1763-23-1	48.4	17.0	24.9	49.8	J	B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFDA	335-76-2	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
8:2 FTS	39108-34-4	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFNS	68259-12-1	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
MeFOSAA	2355-31-9	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
EtFOSAA	2991-50-6	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFUnA	2058-94-8	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFDS	335-77-3	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFDoA	307-55-1	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFTrDA	72629-94-8	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
PFTeDA	376-06-7	ND	17.0	24.9	49.8		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.2	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C3-PFPeA	IS	92.1	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C3-PFBS	IS	106	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-4:2 FTS	IS	84.9	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-PFHxA	IS	92.5	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C4-PFHpA	IS	87.0	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
18O2-PFHxS	IS	98.0	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-6:2 FTS	IS	86.1	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-PFOA	IS	66.5	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C5-PFNA	IS	66.8	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C8-PFOSA	IS	57.2	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C8-PFOS	IS	80.3	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-PFDA	IS	87.9	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1

Sample ID: WWTPWW0100180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-Centrifuge
Matrix: Wastewater
Date Collected: 09-May-18 16:15

Laboratory Data

Lab Sample: 1800935-03
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	89.2	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
d3-MeFOSAA	IS	93.4	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
d5-EtFOSAA	IS	91.3	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-PFUnA	IS	73.3	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-PFDoA	IS	78.8	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	1
13C2-PFTeDA	IS	72.2	50 - 150		B8E0190	23-May-18	0.0201 L	30-May-18 07:00	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: WWTPWW0100180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-ManHole-MC
Matrix: Wastewater
Date Collected: 09-May-18 16:30

Laboratory Data

Lab Sample: 1800935-04
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	294	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFPeA	2706-90-3	959	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFBS	375-73-5	18.2	17.0	24.8	49.6	J	B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
4:2 FTS	757124-72-4	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFHxA	307-24-4	1400	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFPeS	2706-91-4	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFHpA	375-85-9	757	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFHxS	355-46-4	17.7	17.0	24.8	49.6	J	B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
6:2 FTS	27619-97-2	1910	84.9	124	248	D	B8E0190	23-May-18	0.0202 L	02-Jun-18 18:29	5
PFOA	335-67-1	91.6	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFHpS	375-92-8	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFNA	375-95-1	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFOSA	754-91-6	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFOS	1763-23-1	3180	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFDA	335-76-2	17.1	17.0	24.8	49.6	J	B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
8:2 FTS	39108-34-4	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFNS	68259-12-1	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
MeFOSAA	2355-31-9	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
EtFOSAA	2991-50-6	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFUnA	2058-94-8	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFDS	335-77-3	41.0	17.0	24.8	49.6	J	B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFDoA	307-55-1	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFTrDA	72629-94-8	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
PFTeDA	376-06-7	ND	17.0	24.8	49.6		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.1	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C3-PFPeA	IS	90.9	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C3-PFBS	IS	99.1	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-4:2 FTS	IS	87.9	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-PFHxA	IS	93.4	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C4-PFHpA	IS	93.8	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
18O2-PFHxS	IS	90.9	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-6:2 FTS	IS	97.7	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-PFOA	IS	79.4	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C5-PFNA	IS	78.7	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C8-PFOSA	IS	51.1	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C8-PFOS	IS	84.8	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-PFDA	IS	83.6	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1

Sample ID: WWTPWW0100180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-ManHole-MC
Matrix: Wastewater
Date Collected: 09-May-18 16:30

Laboratory Data

Lab Sample: 1800935-04
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	80.4	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
d3-MeFOSAA	IS	70.5	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
d5-EtFOSAA	IS	62.8	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-PFUnA	IS	59.4	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-PFDoA	IS	56.0	50 - 150		B8E0190	23-May-18	0.0202 L	30-May-18 07:10	1
13C2-PFTeDA	IS	27.5	50 - 150	H	B8E0190	23-May-18	0.0202 L	30-May-18 07:10	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

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Solid

Laboratory Data

Lab Sample: B8F0074-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		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFPeA	2706-90-3	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFBS	375-73-5	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFHxA	307-24-4	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFHpA	375-85-9	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFHxS	355-46-4	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
6:2 FTS	27619-97-2	1.99	0.845	1.00	2.00	J	B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFOA	335-67-1	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFHpS	375-92-8	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFNA	375-95-1	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFOSA	754-91-6	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFDA	335-76-2	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
8:2 FTS	39108-34-4	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFNS	68259-12-1	ND	1.43	1.50	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
MeFOSAA	2355-31-9	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
EtFOSAA	2991-50-6	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFUnA	2058-94-8	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFDS	335-77-3	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFDoA	307-55-1	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFTrDA	72629-94-8	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
PFTeDA	376-06-7	ND	0.845	1.00	2.00		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.7	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C3-PFPeA	IS	85.9	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C3-PFBS	IS	98.7	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-4:2 FTS	IS	85.1	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-PFHxA	IS	88.2	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C4-PFHpA	IS	84.9	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
18O2-PFHxS	IS	96.1	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-6:2 FTS	IS	86.0	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-PFOA	IS	79.0	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C5-PFNA	IS	86.8	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C8-PFOSA	IS	37.3	50 - 150	H	B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C8-PFOS	IS	98.4	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-PFDA	IS	73.0	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1

Sample ID: Method Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Solid

Laboratory Data

Lab Sample: B8F0074-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	90.6	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
d3-MeFOSAA	IS	83.8	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
d5-EtFOSAA	IS	79.9	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-PFUnA	IS	81.7	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-PFDoA	IS	72.1	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1
13C2-PFTeDA	IS	75.4	50 - 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:23	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
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

Name: Merit Laboratories, Inc. Matrix: Solid
Project: Lapeer

Laboratory Data

Lab Sample: B8F0074-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	8.61	10.0	86.1	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFPeA	2706-90-3	8.90	10.0	89.0	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFBS	375-73-5	8.84	10.0	88.4	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
4:2 FTS	757124-72-4	8.77	10.0	87.7	60 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFHxA	307-24-4	9.29	10.0	92.9	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFPeS	2706-91-4	9.64	10.0	96.4	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFHpA	375-85-9	8.86	10.0	88.6	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFHxS	355-46-4	8.72	10.0	87.2	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
6:2 FTS	27619-97-2	13.4	10.0	134	60 - 130	B, H	B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFOA	335-67-1	10.2	10.0	102	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFHpS	375-92-8	9.49	10.0	94.9	60 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFNA	375-95-1	8.13	10.0	81.3	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFOSA	754-91-6	8.61	10.0	86.1	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFOS	1763-23-1	7.48	10.0	74.8	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFDA	335-76-2	9.13	10.0	91.3	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
8:2 FTS	39108-34-4	9.29	10.0	92.9	60 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFNS	68259-12-1	7.73	10.0	77.3	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
MeFOSAA	2355-31-9	6.95	10.0	69.5	70 - 130	H	B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
EtFOSAA	2991-50-6	9.82	10.0	98.2	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFUnA	2058-94-8	8.81	10.0	88.1	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFDS	335-77-3	9.12	10.0	91.2	60 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFDoA	307-55-1	8.63	10.0	86.3	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFTrDA	72629-94-8	9.51	10.0	95.1	60 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
PFTeDA	376-06-7	8.28	10.0	82.8	70 - 130		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	100	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C3-PFPeA	IS	96.2	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C3-PFBS	IS	106	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-4:2 FTS	IS	106	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-PFHxA	IS	97.8	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C4-PFHpA	IS	95.5	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
18O2-PFHxS	IS	100	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-6:2 FTS	IS	92.6	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-PFOA	IS	87.7	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C5-PFNA	IS	80.1	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1

Sample ID: OPR **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Solid

Laboratory Data

Lab Sample: B8F0074-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	35.8	50- 150	H	B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C8-PFOS	IS	102	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-PFDA	IS	83.0	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-8:2 FTS	IS	108	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
d3-MeFOSAA	IS	72.3	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
d5-EtFOSAA	IS	61.8	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-PFUnA	IS	76.8	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-PFDoA	IS	76.7	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1
13C2-PFTeDA	IS	79.1	50- 150		B8F0074	11-Jun-18	1.00 g	15-Jun-18 13:13	1

Sample ID: WWTPSL0100180509N **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-Mixing Cell
Matrix: Sludge
Date Collected: 09-May-18 17:05

Laboratory Data

Lab Sample: 1800935-05
Date Received: 12-May-18 09:57
% Solids: 4.98
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	8.73	5.58	6.61	13.2	J	B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFPeA	2706-90-3	26.0	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFBS	375-73-5	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
4:2 FTS	757124-72-4	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFHxA	307-24-4	48.0	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFPeS	2706-91-4	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFHpA	375-85-9	14.8	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFHxS	355-46-4	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
6:2 FTS	27619-97-2	562	5.58	6.61	13.2	B	B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFOA	335-67-1	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFHpS	375-92-8	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFNA	375-95-1	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFOSA	754-91-6	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFOS	1763-23-1	1680	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFDA	335-76-2	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
8:2 FTS	39108-34-4	8.51	5.58	6.61	13.2	J	B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFNS	68259-12-1	ND	9.45	9.91	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
MeFOSAA	2355-31-9	9.86	5.58	6.61	13.2	J	B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
EtFOSAA	2991-50-6	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFUnA	2058-94-8	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFDS	335-77-3	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFDoA	307-55-1	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFTrDA	72629-94-8	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
PFTeDA	376-06-7	ND	5.58	6.61	13.2		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.4	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C3-PFPeA	IS	93.9	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C3-PFBS	IS	99.5	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-4:2 FTS	IS	90.7	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-PFHxA	IS	95.5	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C4-PFHpA	IS	96.2	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
18O2-PFHxS	IS	94.0	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-6:2 FTS	IS	95.2	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-PFOA	IS	90.0	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C5-PFNA	IS	87.9	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C8-PFOSA	IS	59.1	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C8-PFOS	IS	90.9	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-PFDA	IS	94.6	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1

Sample ID: WWTPSL0100180509N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-Mixing Cell
Matrix: Sludge
Date Collected: 09-May-18 17:05

Laboratory Data

Lab Sample: 1800935-05
Date Received: 12-May-18 09:57
% Solids: 4.98
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	130	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
d3-MeFOSAA	IS	67.7	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
d5-EtFOSAA	IS	73.8	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-PFUnA	IS	81.7	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-PFDoA	IS	84.8	50 - 150		B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1
13C2-PFTeDA	IS	40.8	50 - 150	H	B8F0074	11-Jun-18	3.04 g	15-Jun-18 13:34	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
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: Blank

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Solid

Laboratory Data

Lab Sample: B8F0153-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		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFPeA	2706-90-3	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFBS	375-73-5	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
4:2 FTS	757124-72-4	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFHxA	307-24-4	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFPeS	2706-91-4	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFHpA	375-85-9	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFHxS	355-46-4	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
6:2 FTS	27619-97-2	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFOA	335-67-1	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFHpS	375-92-8	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFNA	375-95-1	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFOSA	754-91-6	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFOS	1763-23-1	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFDA	335-76-2	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
8:2 FTS	39108-34-4	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFNS	68259-12-1	ND	1.43	1.50	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
MeFOSAA	2355-31-9	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
EtFOSAA	2991-50-6	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFUnA	2058-94-8	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFDS	335-77-3	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFDoA	307-55-1	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFTrDA	72629-94-8	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
PFTeDA	376-06-7	ND	0.845	1.00	2.00		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.2	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C3-PFPeA	IS	91.3	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C3-PFBS	IS	103	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-4:2 FTS	IS	86.0	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-PFHxA	IS	85.7	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C4-PFHpA	IS	86.9	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
18O2-PFHxS	IS	92.9	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-6:2 FTS	IS	82.5	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-PFOA	IS	75.6	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C5-PFNA	IS	78.7	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C8-PFOSA	IS	45.7	50 - 150	H	B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C8-PFOS	IS	104	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-PFDA	IS	56.2	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1

Sample ID: Blank **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc. Matrix: Solid

Project: Lapeer

Laboratory Data

Lab Sample: B8F0153-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	76.5	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
d3-MeFOSAA	IS	86.6	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
d5-EtFOSAA	IS	90.5	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-PFUnA	IS	63.7	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-PFDoA	IS	64.3	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1
13C2-PFTeDA	IS	61.9	50 - 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:28	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
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: LCS **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc. Matrix: Solid
Project: Lapeer

Laboratory Data

Lab Sample: B8F0153-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	11.1	10.0	111	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFPeA	2706-90-3	11.3	10.0	113	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFBS	375-73-5	11.8	10.0	118	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
4:2 FTS	757124-72-4	11.0	10.0	110	60 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFHxA	307-24-4	11.7	10.0	117	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFPeS	2706-91-4	12.3	10.0	123	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFHpA	375-85-9	11.3	10.0	113	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFHxS	355-46-4	12.2	10.0	122	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
6:2 FTS	27619-97-2	11.8	10.0	118	60 - 130		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:18	1
PFOA	335-67-1	12.8	10.0	128	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFHpS	375-92-8	13.7	10.0	137	60 - 130	H	B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFNA	375-95-1	10.4	10.0	104	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFOSA	754-91-6	10.0	10.0	100	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFOS	1763-23-1	10.7	10.0	107	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFDA	335-76-2	7.56	10.0	75.6	70 - 130		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:18	1
8:2 FTS	39108-34-4	15.1	10.0	151	60 - 130	H	B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFNS	68259-12-1	10.7	10.0	107	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
MeFOSAA	2355-31-9	10.4	10.0	104	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
EtFOSAA	2991-50-6	8.60	10.0	86.0	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFUnA	2058-94-8	11.0	10.0	110	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFDS	335-77-3	11.3	10.0	113	60 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFDoA	307-55-1	11.1	10.0	111	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFTrDA	72629-94-8	9.67	10.0	96.7	60 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
PFTeDA	376-06-7	12.1	10.0	121	70 - 130		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	88.0	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C3-PFPeA	IS	84.8	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C3-PFBS	IS	97.0	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C2-4:2 FTS	IS	92.5	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C2-PFHxA	IS	77.7	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C4-PFHpA	IS	80.5	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
18O2-PFHxS	IS	79.1	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C2-6:2 FTS	IS	74.9	50- 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:18	1
13C2-PFOA	IS	67.7	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C5-PFNA	IS	74.8	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1

Sample ID: LCS **VAL - PFAS**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Solid

Laboratory Data

Lab Sample: B8F0153-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	46.2	50- 150	H	B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C8-PFOS	IS	89.7	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C2-PFDA	IS	57.2	50- 150		B8F0153	20-Jun-18	1.00 g	23-Jun-18 07:18	1
13C2-8:2 FTS	IS	89.9	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
d3-MeFOSAA	IS	68.2	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
d5-EtFOSAA	IS	82.0	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C2-PFUnA	IS	66.3	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C2-PFDoA	IS	76.9	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1
13C2-PFTeDA	IS	67.5	50- 150		B8F0153	20-Jun-18	1.00 g	25-Jun-18 18:31	1

Sample ID: WWTPSL0100180509N

VAL - PFAS

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: WWTP-Centrifuge
Matrix: Solid
Date Collected: 09-May-18 15:45

Laboratory Data

Lab Sample: 1800935-06
Date Received: 12-May-18 09:57
% Solids: 7.78
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFPeA	2706-90-3	5.82	3.51	4.16	8.32	J	B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFBS	375-73-5	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
4:2 FTS	757124-72-4	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFHxA	307-24-4	13.2	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFPeS	2706-91-4	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFHpA	375-85-9	15.4	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFHxS	355-46-4	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
6:2 FTS	27619-97-2	7.41	3.51	4.16	8.32	J	B8F0153	20-Jun-18	3.09 g	23-Jun-18 07:49	1
PFOA	335-67-1	4.34	3.51	4.16	8.32	J	B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFHpS	375-92-8	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFNA	375-95-1	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFOSA	754-91-6	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFOS	1763-23-1	161	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFDA	335-76-2	3.94	3.51	4.16	8.32	J	B8F0153	20-Jun-18	3.09 g	23-Jun-18 07:49	1
8:2 FTS	39108-34-4	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFNS	68259-12-1	ND	5.95	6.24	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
MeFOSAA	2355-31-9	5.89	3.51	4.16	8.32	J	B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
EtFOSAA	2991-50-6	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFUnA	2058-94-8	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFDS	335-77-3	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFDoA	307-55-1	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFTrDA	72629-94-8	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
PFTeDA	376-06-7	ND	3.51	4.16	8.32		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	87.9	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C3-PFPeA	IS	83.5	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C3-PFBS	IS	91.7	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C2-4:2 FTS	IS	80.6	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C2-PFHxA	IS	80.5	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C4-PFHpA	IS	90.1	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
18O2-PFHxS	IS	84.5	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C2-6:2 FTS	IS	85.3	50 - 150		B8F0153	20-Jun-18	3.09 g	23-Jun-18 07:49	1
13C2-PFOA	IS	82.4	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C5-PFNA	IS	87.7	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C8-PFOSA	IS	55.0	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C8-PFOS	IS	85.2	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C2-PFDA	IS	70.7	50 - 150		B8F0153	20-Jun-18	3.09 g	23-Jun-18 07:49	1

Sample ID: WWTPSL0100180509N

VAL - PFAS

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Solid
Project:	Lapeer	Date Collected:	09-May-18 15:45
Location:	WWTP-Centrifuge		

Laboratory Data

Lab Sample:	1800935-06	Column:	BEH C18
Date Received:	12-May-18 09:57		
% Solids:	7.78		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-8:2 FTS	IS	104	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
d3-MeFOSAA	IS	39.2	50 - 150	H	B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
d5-EtFOSAA	IS	43.4	50 - 150	H	B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C2-PFUnA	IS	73.1	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C2-PFDoA	IS	79.2	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1
13C2-PFTeDA	IS	55.4	50 - 150		B8F0153	20-Jun-18	3.09 g	25-Jun-18 18:41	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

The results are reported in dry weight.
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**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
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.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
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.

Revised COC - received from client 6/19/18 JW

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800935 Temp: °C
Storage ID: Storage Secured: Yes ☐ No ☐

TAT (check one): Standard: [x] 21 days
Rush (surcharge may apply) [ ] 14 days [ ] 7 days Specify:

Project ID: **Lapeer PFAS Biosolids Investigation** PO#: **60570635** Sampler: **Stan Krenz** (name)

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
Dorin Bogdan	**5/16/2018**	**17:30**			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Container(s)

PFAS Isotope Dilution

USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/isomers	List of 24	List of 24 w/isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
WWTPEF0100180509N	**5/9/18**	**1505**	**WWTP-EFF**	**2**	**P**	**EF**			**X**							**Effluent Sample**
WWTPSL0100180509N	**5/9/18**	**1545**	**WWTP-Centrifuge**	**2**	**P**	**SL**			**X**							**Centrifuge - SLUDGE**
WWTPWW0100180509N	**5/9/18**	**1615**	**WWTP-Centrifuge**	**2**	**P**	**WW**			**X**							**Centrifuge - Wastewater**
WWTPWW0100180509N	**5/9/18**	**1630**	**WWTP-ManHole-MC**	**2**	**P**	**WW**			**X**							**Man Hole near mixing cell - Wastewater**
WWTPSL0100180509N	**5/9/18**	**1705**	**WWTP-Mixing Cell**	**2**	**P**	**SL**			**X**							**Mixing Cell - SLUDGE**

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800935 Temp: 1.9 °C
Storage ID: WR-2 Storage Secured: Yes [X] No [ ]

Project ID: **Lapeer** PO#: **60570635** Sampler: **Stan Krenz** (name)

TAT (check one): Standard: [x] 21 days; 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
Stan Krenz	5-11-18	1245	Bethnie Benedict	05/12/18	1030
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: ~~FED EX~~

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
CL1EF0100180509N	5/9/18	1110	Lapeer	2	P	EF			X							
CL1CS0100180509N	5/9/18	1135	Lapeer	2	P	SL			X							Centrifuge Soil
CL1CW0100180509N	5/9/18	1140	Lapeer	2	P	WW			X							Centrifuge Water
CL1MH0100180509N	5/9/18	1200	Lapeer	2	P	WW			X							Mixing cell waste water
CL1MC0100180509N	5/9/18	1210	Lapeer	2	P	SL			X							Mixing cell soil

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800935 **TAT** std

Samples Arrival:	**Date/Time** 05/12/18 0957	**Initials:** [illegible]	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 05/12/18 1139	**Initials:** MWS	**Location:** WR-2 **Shelf/Rack:** 2-4

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 2.0 (uncorrected)	**Time:** 1034	**Thermometer ID:** IR-4
Temp °C: 1.9 (corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	MWS		
Holding Time Acceptable?	MWS		
Shipping Container(s) Intact?	[illegible]		
Shipping Custody Seals Intact?	[illegible]		
Shipping Documentation Present?	[illegible]		
Airbill 2 of 2 Trk # 7722 1188 4554	[illegible]		
Sample Container Intact?	MWS		
Sample Custody Seals Intact?			MWS
Chain of Custody / Sample Documentation Present?		[illegible]	
COC Anomaly/Sample Acceptance Form completed?		MWS	MWS

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						MWS
Preservation Documented:	$Na_2S_2O_3$	Trizma	(None)	Yes	(No)	(NA)
Shipping Container	(Vista)	Client	(Retain)	Return	Dispose	

Comments:

June 12, 2018

Vista Work Order No. 1800937

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 May 12, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'Lapeer'.

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.

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

Sincerely,

Martha Maier
Laboratory Director

Vista Work Order No. 1800937
Case Narrative

Sample Condition on Receipt:

Ten 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. Two sample ID discrepancies were resolved as directed; the IDs have been reported as listed on the revised CoC received by email.

Analytical Notes:

PFAS Isotope Dilution Method

The samples 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).

Holding Times

The samples were extracted and analyzed within the method hold times. Two samples were re-extracted for several analytes; the re-extractions were performed outside of the hold time.

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 each preparation batch. No analytes were detected in the Method Blanks above 1/2 the LOQ. The recoveries of 8:2 FTS, MeFOSAA, PFUnA, PFDS and PFTeDA were > 130% in the original OPR. One or more of these analytes were detected in two samples and those samples were re-extracted. The recoveries of all other analytes were within the method acceptance criteria.

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

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
1800937-01	CL1TMW0118180503N	PFAS Isotope Dilution Method	13C8-PFOSA	H	45.2
1800937-02	CL1TMW0405180504N	PFAS Isotope Dilution Method	13C8-PFOSA	H	34.3
1800937-08	CL1DR0200180509N	PFAS Isotope Dilution Method	13C8-PFOSA	H	41.4
B8E0111-BLK1	B8E0111-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	38.6
B8E0111-BS1	B8E0111-BS1	PFAS Isotope Dilution Method	13C8-PFOSA	H	33.5

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800937-01	CL1TMW0118180503N	03-May-18 08:55	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-02	CL1TMW0405180504N	04-May-18 10:45	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-03	CL1SW0300180508N	08-May-18 11:35	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-04	CL1SW0400180508N	08-May-18 12:00	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-05	CL1SW0500180508N	08-May-18 12:25	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-06	CL1DR0100180508N	08-May-18 12:45	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-07	CL1DR0300180508N	08-May-18 14:20	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-08	CL1DR0200180509N	09-May-18 12:45	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-09	CL1SW0100180509N	09-May-18 13:05	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800937-10	CL1SW0200180509N	09-May-18 13:25	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0111-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	0.365	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFPeA	2706-90-3	ND	0.640	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFBS	375-73-5	ND	0.895	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
4:2 FTS	757124-72-4	ND	1.37	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFHxA	307-24-4	ND	1.09	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFPeS	2706-91-4	ND	1.37	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFHpA	375-85-9	ND	0.296	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFHxS	355-46-4	ND	0.474	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
6:2 FTS	27619-97-2	ND	1.00	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFOA	335-67-1	ND	0.326	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFHpS	375-92-8	ND	0.469	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFNA	375-95-1	ND	0.405	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFOSA	754-91-6	ND	0.885	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFOS	1763-23-1	ND	0.404	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFDA	335-76-2	ND	0.745	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
8:2 FTS	39108-34-4	ND	1.03	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFNS	68259-12-1	ND	1.94	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
MeFOSAA	2355-31-9	ND	0.825	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
EtFOSAA	2991-50-6	ND	0.685	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFUnA	2058-94-8	ND	0.525	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFDS	335-77-3	ND	0.615	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFDoA	307-55-1	ND	0.396	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFTrDA	72629-94-8	ND	0.247	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
PFTeDA	376-06-7	ND	0.378	2.50	4.00		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.1	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C3-PFPeA	IS	93.4	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C3-PFBS	IS	110	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C2-PFHxA	IS	93.4	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C4-PFHpA	IS	95.5	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
18O2-PFHxS	IS	96.8	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C2-PFOA	IS	76.4	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C5-PFNA	IS	75.6	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C8-PFOSA	IS	38.6	50 - 150	H	B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C8-PFOS	IS	91.5	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C2-PFDA	IS	68.2	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
d3-MeFOSAA	IS	78.8	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
d5-EtFOSAA	IS	80.3	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1

Sample ID: Method Blank — **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Lapeer

Laboratory Data

Lab Sample: B8E0111-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	64.0	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C2-PFDoA	IS	72.8	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1
13C2-PFTeDA	IS	74.2	50 - 150		B8E0111	17-May-18	0.250 L	30-May-18 01:25	1

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit

Results reported to the DL.

When reported, PFHxS, PFOA and PFOS 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

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0111-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	45.6	40.0	114	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFPeA	2706-90-3	45.2	40.0	113	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFBS	375-73-5	43.4	40.0	109	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
4:2 FTS	757124-72-4	49.6	40.0	124	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFHxA	307-24-4	45.7	40.0	114	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFPeS	2706-91-4	45.2	40.0	113	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFHpA	375-85-9	46.6	40.0	117	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFHxS	355-46-4	49.0	40.0	122	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
6:2 FTS	27619-97-2	48.9	40.0	122	60 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFOA	335-67-1	44.6	40.0	112	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFHpS	375-92-8	45.4	40.0	113	60 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFNA	375-95-1	47.5	40.0	119	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFOSA	754-91-6	45.6	40.0	114	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFOS	1763-23-1	49.6	40.0	124	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFDA	335-76-2	47.4	40.0	119	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
8:2 FTS	39108-34-4	54.7	40.0	137	60 - 130	H	B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFNS	68259-12-1	44.2	40.0	110	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
MeFOSAA	2355-31-9	52.4	40.0	131	70 - 130	H	B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
EtFOSAA	2991-50-6	44.5	40.0	111	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFUnA	2058-94-8	52.2	40.0	131	70 - 130	H	B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFDS	335-77-3	53.6	40.0	134	60 - 130	H	B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFDoA	307-55-1	50.0	40.0	125	70 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFTrDA	72629-94-8	41.7	40.0	104	60 - 130		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
PFTeDA	376-06-7	52.5	40.0	131	70 - 130	H	B8E0111	17-May-18	0.250 L	30-May-18 01:14	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	92.3	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C3-PFPeA	IS	90.4	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C3-PFBS	IS	112	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C2-PFHxA	IS	90.7	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C4-PFHpA	IS	95.2	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
18O2-PFHxS	IS	89.6	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C2-PFOA	IS	79.3	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C5-PFNA	IS	83.6	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C8-PFOSA	IS	33.5	50- 150	H	B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C8-PFOS	IS	92.9	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0111-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	73.1	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
d3-MeFOSAA	IS	61.5	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
d5-EtFOSAA	IS	68.2	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C2-PFUnA	IS	64.8	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C2-PFDoA	IS	68.2	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1
13C2-PFTeDA	IS	64.9	50- 150		B8E0111	17-May-18	0.250 L	30-May-18 01:14	1

Sample ID: Method Blank — **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Lapeer

Laboratory Data

Lab Sample: B8F0003-BLK1 Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFUnA	2058-94-8	ND	0.525	2.50	4.00		B8F0003	01-Jun-18	0.250 L	04-Jun-18 01:40	1
PFDS	335-77-3	ND	0.615	2.50	4.00		B8F0003	01-Jun-18	0.250 L	04-Jun-18 01:40	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	64.2	50 - 150		B8F0003	01-Jun-18	0.250 L	04-Jun-18 01:40	1

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit

Results reported to the DL.

When reported, PFHxS, PFOA and PFOS 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

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8F0003-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFUnA	2058-94-8	51.3	40.0	128	70 - 130		B8F0003	01-Jun-18	0.250 L	04-Jun-18 01:30	1
PFDS	335-77-3	52.1	40.0	130	60 - 130		B8F0003	01-Jun-18	0.250 L	04-Jun-18 01:30	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	79.6	50- 150		B8F0003	01-Jun-18	0.250 L	04-Jun-18 01:30	1

Sample ID: CL1TMW0118180503N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 03-May-18 08:55

Laboratory Data

Lab Sample: 1800937-01
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.361	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFPeA	2706-90-3	ND	0.633	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFBS	375-73-5	ND	0.886	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
4:2 FTS	757124-72-4	ND	1.36	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFHxA	307-24-4	ND	1.08	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFPeS	2706-91-4	ND	1.36	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFHpA	375-85-9	ND	0.292	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFHxS	355-46-4	ND	0.469	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
6:2 FTS	27619-97-2	ND	0.990	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFOA	335-67-1	0.871	0.322	2.47	3.96	J	B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFHpS	375-92-8	ND	0.464	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFNA	375-95-1	ND	0.401	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFOSA	754-91-6	ND	0.876	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFOS	1763-23-1	15.0	0.399	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFDA	335-76-2	ND	0.737	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
8:2 FTS	39108-34-4	ND	1.02	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFNS	68259-12-1	ND	1.92	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
MeFOSAA	2355-31-9	ND	0.817	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
EtFOSAA	2991-50-6	ND	0.678	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFUnA	2058-94-8	ND	0.520	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFDS	335-77-3	ND	0.609	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFDoA	307-55-1	ND	0.392	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFTrDA	72629-94-8	ND	0.244	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
PFTeDA	376-06-7	ND	0.374	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.6	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C3-PFPeA	IS	97.6	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C3-PFBS	IS	129	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C2-PFHxA	IS	105	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C4-PFHpA	IS	99.6	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
18O2-PFHxS	IS	101	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C2-PFOA	IS	82.7	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C5-PFNA	IS	78.9	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C8-PFOSA	IS	45.2	50 - 150	H	B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C8-PFOS	IS	87.4	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C2-PFDA	IS	84.2	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
d3-MeFOSAA	IS	76.7	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
d5-EtFOSAA	IS	81.3	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1

Sample ID: CL1TMW0118180503N **PFAS Isotope Dilution Method**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Lapeer	Date Collected:	03-May-18 08:55
Location:	08n10e33-CL01		

Laboratory Data

Lab Sample:	1800937-01	Column:	BEH C18
Date Received:	12-May-18 09:57		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	81.3	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C2-PFDoA	IS	75.2	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1
13C2-PFTeDA	IS	71.9	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 02:59	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1TMW0405180504N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 04-May-18 10:45

Laboratory Data

Lab Sample: 1800937-02
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	492	0.361	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFPeA	2706-90-3	944	0.634	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFBS	375-73-5	531	0.886	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
4:2 FTS	757124-72-4	ND	1.36	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFHxA	307-24-4	1140	1.08	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFPeS	2706-91-4	4.90	1.36	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFHpA	375-85-9	662	0.293	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFHxS	355-46-4	115	0.469	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
6:2 FTS	27619-97-2	2.07	0.990	2.47	3.96	J	B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFOA	335-67-1	1930	9.67	74.1	119	D	B8E0111	17-May-18	0.253 L	09-Jun-18 04:06	30
PFHpS	375-92-8	43.5	0.464	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFNA	375-95-1	241	0.401	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFOSA	754-91-6	12.1	0.876	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFOS	1763-23-1	35300	12.0	74.1	119	D	B8E0111	17-May-18	0.253 L	09-Jun-18 04:06	30
PFDA	335-76-2	385	0.738	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
8:2 FTS	39108-34-4	ND	1.02	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFNS	68259-12-1	ND	1.92	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
MeFOSAA	2355-31-9	ND	0.817	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
EtFOSAA	2991-50-6	4.62	0.678	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFUnA	2058-94-8	10.0	0.515	2.45	3.93		B8F0003	01-Jun-18	0.255 L	04-Jun-18 02:33	1
PFDS	335-77-3	2.03	0.604	2.45	3.93	J	B8F0003	01-Jun-18	0.255 L	04-Jun-18 02:33	1
PFDoA	307-55-1	3.62	0.392	2.47	3.96	J	B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFTrDA	72629-94-8	ND	0.245	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
PFTeDA	376-06-7	ND	0.374	2.47	3.96		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.5	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C3-PFPeA	IS	85.1	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C3-PFBS	IS	94.4	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C2-PFHxA	IS	91.2	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C4-PFHpA	IS	97.2	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
18O2-PFHxS	IS	89.4	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C2-PFOA	IS	100	50 - 150	D	B8E0111	17-May-18	0.253 L	09-Jun-18 04:06	30
13C5-PFNA	IS	81.1	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C8-PFOSA	IS	34.3	50 - 150	H	B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C8-PFOS	IS	108	50 - 150	D	B8E0111	17-May-18	0.253 L	09-Jun-18 04:06	30
13C2-PFDA	IS	73.0	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
d3-MeFOSAA	IS	73.5	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
d5-EtFOSAA	IS	79.8	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1

Sample ID: CL1TMW0405180504N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 04-May-18 10:45

Laboratory Data

Lab Sample: 1800937-02
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	95.0	50 - 150		B8F0003	01-Jun-18	0.255 L	04-Jun-18 02:33	1
13C2-PFDoA	IS	82.9	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1
13C2-PFTeDA	IS	78.1	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:09	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1SW0300180508N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 11:35

Laboratory Data

Lab Sample: 1800937-03
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	48.9	0.358	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFPeA	2706-90-3	81.5	0.628	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFBS	375-73-5	68.5	0.879	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
4:2 FTS	757124-72-4	ND	1.34	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFHxA	307-24-4	92.4	1.07	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFPeS	2706-91-4	1.72	1.34	2.45	3.93	J	B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFHpA	375-85-9	47.7	0.290	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFHxS	355-46-4	11.6	0.465	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
6:2 FTS	27619-97-2	ND	0.982	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFOA	335-67-1	101	0.320	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFHpS	375-92-8	5.03	0.460	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFNA	375-95-1	14.6	0.398	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFOSA	754-91-6	ND	0.869	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFOS	1763-23-1	2060	1.98	12.3	19.6	D	B8E0111	17-May-18	0.255 L	09-Jun-18 04:37	5
PFDA	335-76-2	9.17	0.731	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
8:2 FTS	39108-34-4	ND	1.01	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFNS	68259-12-1	ND	1.90	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
MeFOSAA	2355-31-9	ND	0.810	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
EtFOSAA	2991-50-6	ND	0.672	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFUnA	2058-94-8	ND	0.515	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFDS	335-77-3	ND	0.604	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFDoA	307-55-1	ND	0.389	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFTrDA	72629-94-8	ND	0.242	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
PFTeDA	376-06-7	ND	0.371	2.45	3.93		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.7	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C3-PFPeA	IS	85.0	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C3-PFBS	IS	96.6	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C2-PFHxA	IS	89.1	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C4-PFHpA	IS	92.2	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
18O2-PFHxS	IS	90.5	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C2-PFOA	IS	75.5	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C5-PFNA	IS	75.4	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C8-PFOSA	IS	58.0	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C8-PFOS	IS	102	50 - 150	D	B8E0111	17-May-18	0.255 L	09-Jun-18 04:37	5
13C2-PFDA	IS	77.5	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
d3-MeFOSAA	IS	89.6	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
d5-EtFOSAA	IS	87.1	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1

Sample ID: CL1SW0300180508N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 11:35

Laboratory Data

Lab Sample: 1800937-03
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	80.4	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C2-PFDoA	IS	66.6	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1
13C2-PFTeDA	IS	76.5	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 03:20	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1SW0400180508N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 12:00

Laboratory Data

Lab Sample: 1800937-04
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.31	0.356	2.44	3.91	J	B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFPeA	2706-90-3	3.67	0.626	2.44	3.91	J	B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFBS	375-73-5	1.55	0.875	2.44	3.91	J	B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
4:2 FTS	757124-72-4	ND	1.34	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFHxA	307-24-4	4.13	1.07	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFPeS	2706-91-4	ND	1.34	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFHpA	375-85-9	4.59	0.289	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFHxS	355-46-4	ND	0.463	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
6:2 FTS	27619-97-2	ND	0.978	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFOA	335-67-1	1.24	0.318	2.44	3.91	J	B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFHpS	375-92-8	0.918	0.458	2.44	3.91	J	B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFNA	375-95-1	ND	0.396	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFOSA	754-91-6	ND	0.865	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFOS	1763-23-1	1.47	0.394	2.44	3.91	J	B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFDA	335-76-2	ND	0.728	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
8:2 FTS	39108-34-4	ND	1.01	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFNS	68259-12-1	ND	1.89	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
MeFOSAA	2355-31-9	ND	0.806	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
EtFOSAA	2991-50-6	ND	0.670	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFUnA	2058-94-8	ND	0.513	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFDS	335-77-3	ND	0.601	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFDoA	307-55-1	ND	0.387	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFTrDA	72629-94-8	ND	0.241	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
PFTeDA	376-06-7	ND	0.369	2.44	3.91		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	86.1	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C3-PFPeA	IS	83.9	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C3-PFBS	IS	92.8	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C2-PFHxA	IS	85.3	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C4-PFHpA	IS	89.8	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
18O2-PFHxS	IS	81.7	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C2-PFOA	IS	80.8	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C5-PFNA	IS	71.8	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C8-PFOSA	IS	54.6	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C8-PFOS	IS	78.5	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C2-PFDA	IS	75.1	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
d3-MeFOSAA	IS	71.0	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
d5-EtFOSAA	IS	62.5	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1

Sample ID: CL1SW0400180508N **PFAS Isotope Dilution Method**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Lapeer	Date Collected:	08-May-18 12:00
Location:	08n10e33-CL01		

Laboratory Data

Lab Sample:	1800937-04	Column:	BEH C18
Date Received:	12-May-18 09:57		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	64.0	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C2-PFDoA	IS	72.8	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1
13C2-PFTeDA	IS	62.4	50 - 150		B8E0111	17-May-18	0.256 L	30-May-18 03:30	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1SW0500180508N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 12:25

Laboratory Data

Lab Sample: 1800937-05
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	4.31	0.360	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFPeA	2706-90-3	6.55	0.633	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFBS	375-73-5	3.51	0.885	2.47	3.95	J	B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
4:2 FTS	757124-72-4	ND	1.35	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFHxA	307-24-4	4.64	1.08	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFPeS	2706-91-4	ND	1.35	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFHpA	375-85-9	2.23	0.292	2.47	3.95	J	B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFHxS	355-46-4	1.35	0.468	2.47	3.95	J	B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
6:2 FTS	27619-97-2	ND	0.988	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFOA	335-67-1	3.62	0.322	2.47	3.95	J	B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFHpS	375-92-8	ND	0.463	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFNA	375-95-1	ND	0.400	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFOSA	754-91-6	ND	0.875	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFOS	1763-23-1	19.0	0.399	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFDA	335-76-2	ND	0.736	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
8:2 FTS	39108-34-4	ND	1.02	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFNS	68259-12-1	ND	1.91	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
MeFOSAA	2355-31-9	ND	0.815	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
EtFOSAA	2991-50-6	ND	0.677	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFUnA	2058-94-8	ND	0.519	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFDS	335-77-3	ND	0.608	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFDoA	307-55-1	ND	0.391	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFTrDA	72629-94-8	ND	0.244	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
PFTeDA	376-06-7	ND	0.373	2.47	3.95		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.0	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C3-PFPeA	IS	92.0	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C3-PFBS	IS	102	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C2-PFHxA	IS	87.4	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C4-PFHpA	IS	92.3	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
18O2-PFHxS	IS	88.3	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C2-PFOA	IS	76.0	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C5-PFNA	IS	80.9	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C8-PFOSA	IS	58.9	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C8-PFOS	IS	87.3	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C2-PFDA	IS	79.2	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
d3-MeFOSAA	IS	82.3	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
d5-EtFOSAA	IS	81.7	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1

Sample ID: CL1SW0500180508N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 12:25

Laboratory Data

Lab Sample: 1800937-05
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	70.3	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C2-PFDoA	IS	74.5	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1
13C2-PFTeDA	IS	72.7	50 - 150		B8E0111	17-May-18	0.253 L	30-May-18 03:41	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1DR0100180508N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 12:45

Laboratory Data

Lab Sample: 1800937-06
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.58	0.359	2.46	3.94	J	B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFPeA	2706-90-3	0.918	0.631	2.46	3.94	J	B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFBS	375-73-5	1.22	0.882	2.46	3.94	J	B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
4:2 FTS	757124-72-4	ND	1.35	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFHxA	307-24-4	ND	1.07	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFPeS	2706-91-4	ND	1.35	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFHpA	375-85-9	0.683	0.291	2.46	3.94	J	B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFHxS	355-46-4	ND	0.467	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
6:2 FTS	27619-97-2	ND	0.986	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFOA	335-67-1	1.32	0.321	2.46	3.94	J	B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFHpS	375-92-8	0.927	0.462	2.46	3.94	J	B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFNA	375-95-1	ND	0.399	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFOSA	754-91-6	ND	0.872	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFOS	1763-23-1	1.34	0.398	2.46	3.94	J	B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFDA	335-76-2	ND	0.734	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
8:2 FTS	39108-34-4	ND	1.02	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFNS	68259-12-1	ND	1.91	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
MeFOSAA	2355-31-9	ND	0.813	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
EtFOSAA	2991-50-6	ND	0.675	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFUnA	2058-94-8	ND	0.518	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFDS	335-77-3	ND	0.606	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFDoA	307-55-1	ND	0.390	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFTrDA	72629-94-8	ND	0.243	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
PFTeDA	376-06-7	ND	0.372	2.46	3.94		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	87.1	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C3-PFPeA	IS	85.4	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C3-PFBS	IS	96.1	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C2-PFHxA	IS	78.7	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C4-PFHpA	IS	90.0	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
18O2-PFHxS	IS	81.7	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C2-PFOA	IS	73.3	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C5-PFNA	IS	77.5	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C8-PFOSA	IS	62.2	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C8-PFOS	IS	87.2	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C2-PFDA	IS	78.8	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
d3-MeFOSAA	IS	70.9	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
d5-EtFOSAA	IS	73.7	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1

Sample ID: CL1DR0100180508N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 12:45

Laboratory Data

Lab Sample: 1800937-06
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	76.7	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C2-PFDoA	IS	71.6	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1
13C2-PFTeDA	IS	68.6	50 - 150		B8E0111	17-May-18	0.254 L	30-May-18 03:51	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1DR0300180508N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 14:20

Laboratory Data

Lab Sample: 1800937-07
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.73	0.355	2.43	3.90	J	B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFPeA	2706-90-3	5.29	0.623	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFBS	375-73-5	2.93	0.872	2.43	3.90	J	B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
4:2 FTS	757124-72-4	ND	1.33	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFHxA	307-24-4	ND	1.06	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFPeS	2706-91-4	ND	1.33	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFHpA	375-85-9	ND	0.288	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFHxS	355-46-4	ND	0.461	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
6:2 FTS	27619-97-2	ND	0.974	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFOA	335-67-1	2.50	0.317	2.43	3.90	J	B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFHpS	375-92-8	ND	0.456	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFNA	375-95-1	ND	0.394	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFOSA	754-91-6	ND	0.862	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFOS	1763-23-1	12.9	0.393	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFDA	335-76-2	ND	0.726	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
8:2 FTS	39108-34-4	ND	1.00	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFNS	68259-12-1	ND	1.88	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
MeFOSAA	2355-31-9	ND	0.803	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
EtFOSAA	2991-50-6	ND	0.667	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFUnA	2058-94-8	ND	0.511	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFDS	335-77-3	ND	0.599	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFDoA	307-55-1	ND	0.386	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFTrDA	72629-94-8	ND	0.241	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
PFTeDA	376-06-7	ND	0.368	2.43	3.90		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	88.8	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C3-PFPeA	IS	82.8	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C3-PFBS	IS	92.9	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C2-PFHxA	IS	84.7	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C4-PFHpA	IS	82.8	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
18O2-PFHxS	IS	92.0	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C2-PFOA	IS	80.6	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C5-PFNA	IS	80.8	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C8-PFOSA	IS	54.3	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C8-PFOS	IS	79.5	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C2-PFDA	IS	74.7	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
d3-MeFOSAA	IS	70.1	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
d5-EtFOSAA	IS	76.6	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1

Sample ID: CL1DR0300180508N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 08-May-18 14:20

Laboratory Data

Lab Sample: 1800937-07
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	66.8	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C2-PFDoA	IS	67.8	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1
13C2-PFTeDA	IS	63.6	50 - 150		B8E0111	17-May-18	0.257 L	30-May-18 04:02	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1DR0200180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 09-May-18 12:45

Laboratory Data

Lab Sample: 1800937-08
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	78.6	0.366	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFPeA	2706-90-3	113	0.642	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFBS	375-73-5	80.8	0.898	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
4:2 FTS	757124-72-4	ND	1.37	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFHxA	307-24-4	135	1.09	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFPeS	2706-91-4	1.39	1.37	2.51	4.01	J	B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFHpA	375-85-9	61.1	0.296	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFHxS	355-46-4	8.82	0.475	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
6:2 FTS	27619-97-2	ND	1.00	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFOA	335-67-1	95.2	0.327	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFHpS	375-92-8	3.95	0.470	2.51	4.01	J	B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFNA	375-95-1	23.5	0.406	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFOSA	754-91-6	ND	0.888	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFOS	1763-23-1	1860	0.405	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFDA	335-76-2	30.1	0.747	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
8:2 FTS	39108-34-4	ND	1.03	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFNS	68259-12-1	ND	1.94	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
MeFOSAA	2355-31-9	ND	0.828	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
EtFOSAA	2991-50-6	ND	0.687	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFUnA	2058-94-8	2.41	0.522	2.49	3.98	J	B8F0003	01-Jun-18	0.251 L	04-Jun-18 03:36	1
PFDS	335-77-3	1.17	0.612	2.49	3.98	J	B8F0003	01-Jun-18	0.251 L	04-Jun-18 03:36	1
PFDoA	307-55-1	ND	0.397	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFTrDA	72629-94-8	ND	0.248	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
PFTeDA	376-06-7	ND	0.379	2.51	4.01		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.8	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C3-PFPeA	IS	99.2	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C3-PFBS	IS	130	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C2-PFHxA	IS	95.1	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C4-PFHpA	IS	109	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
18O2-PFHxS	IS	93.8	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C2-PFOA	IS	85.2	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C5-PFNA	IS	87.3	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C8-PFOSA	IS	41.4	50 - 150	H	B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C8-PFOS	IS	86.3	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C2-PFDA	IS	73.0	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
d3-MeFOSAA	IS	69.5	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
d5-EtFOSAA	IS	77.9	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1

Sample ID: CL1DR0200180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 09-May-18 12:45

Laboratory Data

Lab Sample: 1800937-08
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	79.1	50 - 150		B8F0003	01-Jun-18	0.251 L	04-Jun-18 03:36	1
13C2-PFDoA	IS	76.0	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1
13C2-PFTeDA	IS	66.6	50 - 150		B8E0111	17-May-18	0.249 L	30-May-18 04:54	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1SW0100180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 09-May-18 13:05

Laboratory Data

Lab Sample: 1800937-09
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.80	0.351	2.40	3.85	J	B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFPeA	2706-90-3	0.927	0.616	2.40	3.85	J	B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFBS	375-73-5	1.07	0.862	2.40	3.85	J	B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
4:2 FTS	757124-72-4	ND	1.32	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFHxA	307-24-4	ND	1.05	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFPeS	2706-91-4	ND	1.32	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFHpA	375-85-9	0.581	0.285	2.40	3.85	J	B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFHxS	355-46-4	ND	0.456	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
6:2 FTS	27619-97-2	ND	0.963	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFOA	335-67-1	1.11	0.313	2.40	3.85	J	B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFHpS	375-92-8	0.946	0.451	2.40	3.85	J	B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFNA	375-95-1	ND	0.390	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFOSA	754-91-6	ND	0.852	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFOS	1763-23-1	1.04	0.389	2.40	3.85	J	B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFDA	335-76-2	ND	0.718	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
8:2 FTS	39108-34-4	ND	0.992	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFNS	68259-12-1	ND	1.86	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
MeFOSAA	2355-31-9	ND	0.795	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
EtFOSAA	2991-50-6	ND	0.660	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFUnA	2058-94-8	ND	0.506	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFDS	335-77-3	ND	0.592	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFDoA	307-55-1	ND	0.381	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFTrDA	72629-94-8	ND	0.238	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
PFTeDA	376-06-7	ND	0.364	2.40	3.85		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.2	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C3-PFPeA	IS	91.3	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C3-PFBS	IS	99.8	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C2-PFHxA	IS	92.5	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C4-PFHpA	IS	98.8	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
18O2-PFHxS	IS	84.8	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C2-PFOA	IS	86.2	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C5-PFNA	IS	79.6	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C8-PFOSA	IS	51.4	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C8-PFOS	IS	86.0	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C2-PFDA	IS	93.7	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
d3-MeFOSAA	IS	68.7	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
d5-EtFOSAA	IS	73.5	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1

Sample ID: CL1SW0100180509N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 09-May-18 13:05

Laboratory Data

Lab Sample: 1800937-09
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	70.6	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C2-PFDoA	IS	79.1	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1
13C2-PFTeDA	IS	62.6	50 - 150		B8E0111	17-May-18	0.260 L	30-May-18 05:05	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1SW0200180509N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 09-May-18 13:25

Laboratory Data

Lab Sample: 1800937-10
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.12	0.357	2.45	3.92	J	B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFPeA	2706-90-3	2.87	0.627	2.45	3.92	J	B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFBS	375-73-5	1.29	0.877	2.45	3.92	J	B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
4:2 FTS	757124-72-4	ND	1.34	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFHxA	307-24-4	ND	1.07	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFPeS	2706-91-4	ND	1.34	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFHpA	375-85-9	ND	0.290	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFHxS	355-46-4	ND	0.464	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
6:2 FTS	27619-97-2	ND	0.980	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFOA	335-67-1	0.998	0.319	2.45	3.92	J	B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFHpS	375-92-8	ND	0.459	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFNA	375-95-1	ND	0.397	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFOSA	754-91-6	ND	0.868	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFOS	1763-23-1	ND	0.396	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFDA	335-76-2	ND	0.730	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
8:2 FTS	39108-34-4	ND	1.01	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFNS	68259-12-1	ND	1.90	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
MeFOSAA	2355-31-9	ND	0.809	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
EtFOSAA	2991-50-6	ND	0.672	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFUnA	2058-94-8	ND	0.515	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFDS	335-77-3	ND	0.603	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFDoA	307-55-1	ND	0.388	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFTrDA	72629-94-8	ND	0.242	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
PFTeDA	376-06-7	ND	0.370	2.45	3.92		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	88.9	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C3-PFPeA	IS	87.1	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C3-PFBS	IS	94.7	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C2-PFHxA	IS	87.2	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C4-PFHpA	IS	92.4	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
18O2-PFHxS	IS	103	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C2-PFOA	IS	84.0	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C5-PFNA	IS	81.9	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C8-PFOSA	IS	57.3	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C8-PFOS	IS	87.5	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C2-PFDA	IS	82.8	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
d3-MeFOSAA	IS	77.2	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
d5-EtFOSAA	IS	84.0	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1

Sample ID: CL1SW0200180509N **PFAS Isotope Dilution Method**

Client Data

Name:	Merit Laboratories, Inc.	Matrix:	Aqueous
Project:	Lapeer	Date Collected:	09-May-18 13:25
Location:	08n10e33-CL01		

Laboratory Data

Lab Sample:	1800937-10	Column:	BEH C18
Date Received:	12-May-18 09:57		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	78.2	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C2-PFDoA	IS	77.3	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1
13C2-PFTeDA	IS	75.0	50 - 150		B8E0111	17-May-18	0.255 L	30-May-18 05:15	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS 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**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
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.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
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.

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800937 Temp: 1.7, 1.9 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: Lapeer PFAS Biosolids Investigation PO#: 60570635 Sampler: Stan Krenz (name)

TAT (check one): Standard: [x] 21 days; 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
Dorin Bogdan	5/16/2018	17:30			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: FED EX

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537 PFOA/ PFOS	UCMR3 PFAS List6	PFAS List: 14	Comments
CL1TMW0118180503N	5/3/18	0855	08n10e33-CL01	2	P	AQ			X							
CL1TMW0405180504N	5/4/18	1045	08n10e33-CL01	2	P	AQ			X							
CL1SW0300180508N	5/8/18	1135	08n10e33-CL01	2	P	AQ			X							
CL1SW0400180508N	5/8/18	1200	08n10e33-CL01	2	P	AQ			X							
CL1SW0500180508N	5/8/18	1225	08n10e33-CL01	2	P	AQ			X							
CL1DR0100180508N	5/8/18	1245	08n10e33-CL01	2	P	AQ			X							
CL1DR0300180508N	5/8/18	1420	08n10e33-CL01	2	P	AQ			X							
CL1DR0200180509N	5/9/18	1245	08n10e33-CL01	2	P	AQ			X							
CL1SW0100180509N	5/9/18	1305	08n10e33-CL01	2	P	AQ			X							
CL1SW0200180509N	5/9/18	1325	08n10e33-CL01	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: Stephanie Kammer
Company: MDEQ
Address: 525 W. Allegan Street
City: Lansing State: MI Zip: 48909
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Revised COC - received from Dorin Bogdan 5/17/18 @

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800937 Temp: 1.7, 1.9 °C
Storage ID: WR-2 Storage Secured: Yes ☒ No ☐

Project ID: **Lapeer** PO#: **60570635** Sampler: **Stan Krenz** (name)

TAT (check one): Standard: [x] 21 days; 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
Stan Krenz	5-1-18	1245	Bethina Benedict	05/2/18	1030
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: ~~FED EX~~

Tracking No.:

Add Analysis(es) Requested

Container(s)

PFAS Isotope Dilution

USEPA Method 537

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
CL1TMW0118180503N	5/3/18	0855	Lapeer	2	P	AQ			X							
CL1TMW0405180504N	5/4/18	1045	Lapeer	2	P	AQ			X							
CL1SW0300180508N	5/8/18	1135	Lapeer	2	P	AQ			X							
CL1SW0400180508N	5/8/18	1200	Lapeer	2	P	AQ			X							
CL1SW0500180508N	5/8/18	1225	Lapeer	2	P	AQ			X							
CL1DR0100180508N	5/8/18	1245	Lapeer	2	P	AQ			X							
CL1DR0300180508N	5/8/18	1420	Lapeer	2	P	AQ			X							
CL1DR0200180509N	5/9/18	1245	Lapeer	2	P	AQ			X							
CL1SW0100180509N	5/9/18	1305	Lapeer	2	P	AQ			X							
CL1SW0200180509N	5/9/18	1325	Lapeer	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800937 **TAT** std

Samples Arrival:	**Date/Time** 05/12/18 0957	**Initials:** [illegible]	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 05/12/18 1214	**Initials:** WWS	**Location:** WR-2 **Shelf/Rack:** ~~NA~~ WWS E-4

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 1.8 (uncorrected)	**Time:** 1028	**Thermometer ID:** IR-4
Temp °C: 1.7 (corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	WWS		
Holding Time Acceptable?	WWS		
Shipping Container(s) Intact?	BLB		
Shipping Custody Seals Intact?	BLB		
Shipping Documentation Present?	BLB		
Airbill 1 of 2 Trk # 7722 1188 4532	BLB		
Sample Container Intact?	WWS		
Sample Custody Seals Intact?			WWS
Chain of Custody / Sample Documentation Present?	BLB		
COC Anomaly/Sample Acceptance Form completed?	WWS		

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						WWS
Preservation Documented:	$Na_2S_2O_3$	Trizma	(None)		Yes	(No)	(NA)
Shipping Container	(Vista)		Client	(Retain)	Return	Dispose	

Comments:

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800937 **TAT** std

Samples Arrival:	**Date/Time** 05/12/18 0957	**Initials:** BLB	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 05/12/18 1214	**Initials:** MMS	**Location:** WR-2 **Shelf/Rack:** E-4

Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None

Temp °C: 2.0 (uncorrected)	**Time:** 1034	**Thermometer ID:** IR-4
Temp °C: 1.9 (corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	MMS		
Holding Time Acceptable?	MMS		
Shipping Container(s) Intact?	BLB		
Shipping Custody Seals Intact?	BLB		
Shipping Documentation Present?	BLB		
Airbill 2 of 2 Trk # 7722 1188 4554	BLB		
Sample Container Intact?	MMS		
Sample Custody Seals Intact?			MMS
Chain of Custody / Sample Documentation Present?		BLB	
COC Anomaly/Sample Acceptance Form completed?	MMS		

If Chlorinated or Drinking Water Samples, Acceptable Preservation?							MMS
Preservation Documented:	$Na_2S_2O_3$		Trizma		None	Yes	No NA
Shipping Container	Vista		Client		Retain	Return	Dispose

Comments: sample label

~~CLT~~ CLITMW0118180503N
MMS
05/12/18

COC ID

~~CLT~~ CLITMW0118180503N
MMS
05/12/18

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Merit Laboratories, Inc.
Maya Murshak
mayamurshak@meritlabs.com
(517) 827-2744

Workorder Number: 1800937
Date Received: 12-May-18 09:57
Documented by/date: Kim Elric 05/17/18

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

[X] Sample IDs on Chain of Custody do not match Sample Container Labels

Chain of Custody ID	Container Label ID
CL1TMW**01**18180503N	CL1TMW**1**18180503N
CL1TMW**04**05180504N	CL1TMW**4**05180504N

Client Authorization

Proceed with Analysis: (YES) NO Signature and Date [signature] 5/17/18

Client Comments/Instructions Per Dorin Bogdan proceed and use IDs as they are listed on revised COC.

June 14, 2018

Vista Work Order No. 1800938

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 May 12, 2018. This sample set was analyzed on a standard turn-around time, under your Project Name 'Lapeer'.

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.

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

Sincerely,

Martha Maier
Laboratory Director

Vista Work Order No. 1800938
Case Narrative

Sample Condition on Receipt:

Four 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. A revised CoC was received by email on May 17, 2018.

Analytical Notes:

PFAS Isotope Dilution Method

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537).

Holding Times

The samples were extracted and analyzed within the method hold times. The sample re-extractions for 6:2 FTS were performed outside of the hold time.

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 each preparation batch. The concentration of 6:2 FTS was > 1/2 the LOQ in the original Method Blank. The results for 6:2 FTS in samples "CL1MW0124180510N", "CL1MW0229180510N" and "CL1MW0414180510N" were reported from re-extractions of the samples. The OPR recoveries were within the method acceptance criteria.

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

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
B8E0146-BLK1	B8E0146-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	49.1
B8E0146-BS1	B8E0146-BS1	PFAS Isotope Dilution Method	13C8-PFOSA	H	41.7
B8F0041-BLK1	B8F0041-BLK1	PFAS Isotope Dilution Method	13C8-PFOSA	H	41.3
B8F0041-BS1	B8F0041-BS1	PFAS Isotope Dilution Method	13C8-PFOSA	H	34.9

H = Recovery was outside laboratory acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1800938-01	CL1MW0124180510N	10-May-18 09:55	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800938-02	CL1MW0324180510N	10-May-18 11:25	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800938-03	CL1MW0229180510N	10-May-18 12:35	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1800938-04	CL1MW0414180510N	10-May-18 13:45	12-May-18 09:57	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0146-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	0.365	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFPeA	2706-90-3	ND	0.640	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFBS	375-73-5	ND	0.895	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
4:2 FTS	757124-72-4	ND	1.37	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHxA	307-24-4	ND	1.09	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFPeS	2706-91-4	ND	1.37	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHpA	375-85-9	ND	0.296	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHxS	355-46-4	ND	0.474	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
6:2 FTS	27619-97-2	4.47	1.00	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFOA	335-67-1	ND	0.326	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFHpS	375-92-8	ND	0.469	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFNA	375-95-1	ND	0.405	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFOSA	754-91-6	ND	0.885	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFOS	1763-23-1	ND	0.404	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFDA	335-76-2	ND	0.745	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
8:2 FTS	39108-34-4	ND	1.03	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFNS	68259-12-1	ND	1.94	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
MeFOSAA	2355-31-9	ND	0.825	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
EtFOSAA	2991-50-6	ND	0.685	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFUnA	2058-94-8	ND	0.525	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFDS	335-77-3	ND	0.615	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFDoA	307-55-1	ND	0.396	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFTrDA	72629-94-8	ND	0.247	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
PFTeDA	376-06-7	ND	0.378	2.50	4.00		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.4	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C3-PFPeA	IS	95.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C3-PFBS	IS	108	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFHxA	IS	97.4	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C4-PFHpA	IS	99.1	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
18O2-PFHxS	IS	98.0	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFOA	IS	84.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C5-PFNA	IS	84.9	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C8-PFOSA	IS	49.1	50 - 150	H	B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C8-PFOS	IS	99.1	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFDA	IS	72.3	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
d3-MeFOSAA	IS	66.2	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
d5-EtFOSAA	IS	70.1	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Lapeer

Laboratory Data

Lab Sample: B8E0146-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	58.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFDoA	IS	77.3	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1
13C2-PFTeDA	IS	64.8	50 - 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:51	1

DL - Detection Limit

LOD - Limit of Detection

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit

Results reported to the DL.

When reported, PFHxS, PFOA and PFOS 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

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0146-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	38.1	40.0	95.3	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFPeA	2706-90-3	38.5	40.0	96.3	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFBS	375-73-5	37.6	40.0	94.0	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
4:2 FTS	757124-72-4	36.3	40.0	90.7	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHxA	307-24-4	39.0	40.0	97.6	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFPeS	2706-91-4	37.7	40.0	94.3	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHpA	375-85-9	42.1	40.0	105	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHxS	355-46-4	38.4	40.0	96.0	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
6:2 FTS	27619-97-2	37.8	40.0	94.4	60 - 130	B	B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFOA	335-67-1	36.8	40.0	92.0	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFHpS	375-92-8	44.1	40.0	110	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFNA	375-95-1	38.6	40.0	96.4	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFOSA	754-91-6	36.8	40.0	92.1	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFOS	1763-23-1	38.1	40.0	95.2	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFDA	335-76-2	38.0	40.0	95.1	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
8:2 FTS	39108-34-4	32.7	40.0	81.7	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFNS	68259-12-1	41.2	40.0	103	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
MeFOSAA	2355-31-9	35.6	40.0	88.9	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
EtFOSAA	2991-50-6	40.4	40.0	101	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFUnA	2058-94-8	36.4	40.0	91.1	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFDS	335-77-3	48.6	40.0	122	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFDoA	307-55-1	42.0	40.0	105	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFTrDA	72629-94-8	46.0	40.0	115	60 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
PFTeDA	376-06-7	47.4	40.0	118	70 - 130		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.9	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C3-PFPeA	IS	95.4	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C3-PFBS	IS	116	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFHxA	IS	99.9	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C4-PFHpA	IS	89.2	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
18O2-PFHxS	IS	99.6	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFOA	IS	85.1	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C5-PFNA	IS	93.1	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C8-PFOSA	IS	41.7	50- 150	H	B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C8-PFOS	IS	104	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8E0146-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	87.1	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
d3-MeFOSAA	IS	81.6	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
d5-EtFOSAA	IS	78.2	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFUnA	IS	68.3	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFDoA	IS	81.5	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1
13C2-PFTeDA	IS	69.7	50- 150		B8E0146	23-May-18	0.250 L	03-Jun-18 02:41	1

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8F0041-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	0.365	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFPeA	2706-90-3	ND	0.640	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFBS	375-73-5	ND	0.895	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
4:2 FTS	757124-72-4	ND	1.37	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFHxA	307-24-4	ND	1.09	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFPeS	2706-91-4	ND	1.37	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFHpA	375-85-9	ND	0.296	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFHxS	355-46-4	ND	0.474	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
6:2 FTS	27619-97-2	ND	1.00	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFOA	335-67-1	ND	0.326	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFHpS	375-92-8	ND	0.469	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFNA	375-95-1	ND	0.405	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFOSA	754-91-6	ND	0.885	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFOS	1763-23-1	ND	0.404	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFDA	335-76-2	ND	0.745	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
8:2 FTS	39108-34-4	ND	1.03	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFNS	68259-12-1	ND	1.94	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
MeFOSAA	2355-31-9	ND	0.825	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
EtFOSAA	2991-50-6	ND	0.685	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFUnA	2058-94-8	ND	0.525	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFDS	335-77-3	ND	0.615	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFDoA	307-55-1	ND	0.396	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFTrDA	72629-94-8	ND	0.247	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
PFTeDA	376-06-7	ND	0.378	2.50	4.00		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.5	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C3-PFPeA	IS	96.8	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C3-PFBS	IS	115	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C2-PFHxA	IS	96.5	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C4-PFHpA	IS	99.3	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
18O2-PFHxS	IS	101	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C2-PFOA	IS	88.4	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C5-PFNA	IS	93.3	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C8-PFOSA	IS	41.3	50 - 150	H	B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C8-PFOS	IS	88.6	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C2-PFDA	IS	85.6	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
d3-MeFOSAA	IS	66.2	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
d5-EtFOSAA	IS	96.4	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1

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

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: Lapeer

Laboratory Data

Lab Sample: B8F0041-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	80.3	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C2-PFDoA	IS	85.0	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1
13C2-PFTeDA	IS	89.7	50 - 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:41	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS 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

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8F0041-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	39.0	40.0	97.5	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFPeA	2706-90-3	38.3	40.0	95.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFBS	375-73-5	38.7	40.0	96.7	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
4:2 FTS	757124-72-4	37.7	40.0	94.3	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHxA	307-24-4	38.2	40.0	95.5	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFPeS	2706-91-4	38.2	40.0	95.4	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHpA	375-85-9	36.9	40.0	92.3	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHxS	355-46-4	32.6	40.0	81.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
6:2 FTS	27619-97-2	46.3	40.0	116	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFOA	335-67-1	43.5	40.0	109	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFHpS	375-92-8	40.8	40.0	102	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFNA	375-95-1	40.2	40.0	101	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFOSA	754-91-6	31.4	40.0	78.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFOS	1763-23-1	42.9	40.0	107	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFDA	335-76-2	35.0	40.0	87.5	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
8:2 FTS	39108-34-4	28.6	40.0	71.5	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFNS	68259-12-1	34.6	40.0	86.6	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
MeFOSAA	2355-31-9	47.9	40.0	120	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
EtFOSAA	2991-50-6	37.5	40.0	93.9	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFUnA	2058-94-8	36.8	40.0	92.1	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFDS	335-77-3	42.1	40.0	105	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFDoA	307-55-1	38.0	40.0	95.0	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFTrDA	72629-94-8	40.1	40.0	100	60 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
PFTeDA	376-06-7	42.0	40.0	105	70 - 130		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.3	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C3-PFPeA	IS	95.9	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C3-PFBS	IS	111	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFHxA	IS	92.3	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C4-PFHpA	IS	100	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
18O2-PFHxS	IS	98.8	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFOA	IS	96.2	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C5-PFNA	IS	85.8	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C8-PFOSA	IS	34.9	50- 150	H	B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C8-PFOS	IS	90.3	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1

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

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Matrix: Aqueous

Laboratory Data

Lab Sample: B8F0041-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	90.0	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
d3-MeFOSAA	IS	78.8	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
d5-EtFOSAA	IS	104	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFUnA	IS	96.2	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFDoA	IS	80.2	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1
13C2-PFTeDA	IS	83.9	50- 150		B8F0041	08-Jun-18	0.250 L	10-Jun-18 08:20	1

Sample ID: CL1MW0124180510N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 09:55

Laboratory Data

Lab Sample: 1800938-01
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.350	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFPeA	2706-90-3	ND	0.615	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFBS	375-73-5	ND	0.861	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
4:2 FTS	757124-72-4	ND	1.32	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFHxA	307-24-4	ND	1.05	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFPeS	2706-91-4	ND	1.32	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFHpA	375-85-9	ND	0.284	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFHxS	355-46-4	ND	0.455	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
6:2 FTS	27619-97-2	ND	0.952	2.38	3.81		B8F0041	08-Jun-18	0.263 L	13-Jun-18 10:52	1
PFOA	335-67-1	ND	0.313	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFHpS	375-92-8	ND	0.450	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFNA	375-95-1	ND	0.389	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFOSA	754-91-6	ND	0.851	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFOS	1763-23-1	ND	0.388	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFDA	335-76-2	ND	0.716	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
8:2 FTS	39108-34-4	ND	0.990	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFNS	68259-12-1	ND	1.86	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
MeFOSAA	2355-31-9	ND	0.793	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
EtFOSAA	2991-50-6	ND	0.659	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFUnA	2058-94-8	ND	0.505	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFDS	335-77-3	ND	0.591	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFDoA	307-55-1	ND	0.381	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFTrDA	72629-94-8	ND	0.238	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
PFTeDA	376-06-7	ND	0.363	2.40	3.85		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.5	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C3-PFPeA	IS	92.0	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C3-PFBS	IS	101	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C2-PFHxA	IS	92.9	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C4-PFHpA	IS	90.0	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
18O2-PFHxS	IS	99.8	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C2-PFOA	IS	86.2	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C5-PFNA	IS	94.1	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C8-PFOSA	IS	66.6	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C8-PFOS	IS	101	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C2-PFDA	IS	78.8	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
d3-MeFOSAA	IS	94.1	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
d5-EtFOSAA	IS	96.7	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1

Sample ID: CL1MW0124180510N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 09:55

Laboratory Data

Lab Sample: 1800938-01
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	81.0	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C2-PFDoA	IS	86.3	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1
13C2-PFTeDA	IS	79.8	50 - 150		B8E0146	23-May-18	0.260 L	03-Jun-18 05:39	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

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

Sample ID: CL1MW0324180510N **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 11:25

Laboratory Data

Lab Sample: 1800938-02
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.360	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFPeA	2706-90-3	ND	0.633	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFBS	375-73-5	ND	0.885	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
4:2 FTS	757124-72-4	ND	1.35	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFHxA	307-24-4	ND	1.08	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFPeS	2706-91-4	ND	1.35	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFHpA	375-85-9	ND	0.292	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFHxS	355-46-4	ND	0.468	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
6:2 FTS	27619-97-2	1.36	0.989	2.47	3.96	J, B	B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFOA	335-67-1	ND	0.322	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFHpS	375-92-8	ND	0.463	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFNA	375-95-1	ND	0.401	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFOSA	754-91-6	ND	0.875	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFOS	1763-23-1	2.39	0.399	2.47	3.96	J	B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFDA	335-76-2	ND	0.737	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
8:2 FTS	39108-34-4	ND	1.02	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFNS	68259-12-1	ND	1.91	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
MeFOSAA	2355-31-9	ND	0.816	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
EtFOSAA	2991-50-6	ND	0.677	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFUnA	2058-94-8	ND	0.519	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFDS	335-77-3	ND	0.608	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFDoA	307-55-1	ND	0.392	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFTrDA	72629-94-8	ND	0.244	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
PFTeDA	376-06-7	ND	0.373	2.47	3.96		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.7	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C3-PFPeA	IS	95.9	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C3-PFBS	IS	109	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C2-PFHxA	IS	89.2	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C4-PFHpA	IS	100	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
18O2-PFHxS	IS	98.1	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C2-PFOA	IS	86.3	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C5-PFNA	IS	83.7	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C8-PFOSA	IS	77.9	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C8-PFOS	IS	91.6	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C2-PFDA	IS	92.0	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
d3-MeFOSAA	IS	95.0	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
d5-EtFOSAA	IS	100	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1

Sample ID: CL1MW0324180510N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 11:25

Laboratory Data

Lab Sample: 1800938-02
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	81.2	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C2-PFDoA	IS	102	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1
13C2-PFTeDA	IS	84.0	50 - 150		B8E0146	23-May-18	0.253 L	03-Jun-18 05:49	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.

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

Sample ID: CL1MW0229180510N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 12:35

Laboratory Data

Lab Sample: 1800938-03
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	1.11	0.349	2.39	3.83	J	B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFPeA	2706-90-3	1.43	0.613	2.39	3.83	J	B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFBS	375-73-5	ND	0.858	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
4:2 FTS	757124-72-4	ND	1.31	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFHxA	307-24-4	ND	1.04	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFPeS	2706-91-4	ND	1.31	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFHpA	375-85-9	0.613	0.283	2.39	3.83	J	B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFHxS	355-46-4	ND	0.454	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
6:2 FTS	27619-97-2	ND	1.00	2.50	4.00		B8F0041	08-Jun-18	0.250 L	12-Jun-18 08:59	1
PFOA	335-67-1	0.702	0.312	2.39	3.83	J	B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFHpS	375-92-8	ND	0.449	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFNA	375-95-1	ND	0.388	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFOSA	754-91-6	ND	0.848	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFOS	1763-23-1	4.09	0.387	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFDA	335-76-2	ND	0.714	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
8:2 FTS	39108-34-4	ND	0.987	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFNS	68259-12-1	ND	1.85	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
MeFOSAA	2355-31-9	ND	0.791	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
EtFOSAA	2991-50-6	ND	0.656	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFUnA	2058-94-8	ND	0.503	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFDS	335-77-3	ND	0.589	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFDoA	307-55-1	ND	0.379	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFTrDA	72629-94-8	ND	0.237	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
PFTeDA	376-06-7	ND	0.362	2.39	3.83		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.8	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C3-PFPeA	IS	97.3	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C3-PFBS	IS	112	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C2-PFHxA	IS	92.7	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C4-PFHpA	IS	101	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
18O2-PFHxS	IS	93.0	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C2-PFOA	IS	88.9	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C5-PFNA	IS	87.9	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C8-PFOSA	IS	84.3	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C8-PFOS	IS	92.1	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C2-PFDA	IS	93.5	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
d3-MeFOSAA	IS	99.6	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
d5-EtFOSAA	IS	111	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1

Sample ID: CL1MW0229180510N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 12:35

Laboratory Data

Lab Sample: 1800938-03
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	69.6	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C2-PFDoA	IS	78.4	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1
13C2-PFTeDA	IS	92.9	50 - 150		B8E0146	23-May-18	0.261 L	03-Jun-18 06:31	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: CL1MW0414180510N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 13:45

Laboratory Data

Lab Sample: 1800938-04
Date Received: 12-May-18 09:57
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	80.2	0.355	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFPeA	2706-90-3	107	0.623	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFBS	375-73-5	68.9	0.871	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
4:2 FTS	757124-72-4	ND	1.33	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFHxA	307-24-4	103	1.06	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFPeS	2706-91-4	ND	1.33	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFHpA	375-85-9	31.5	0.287	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFHxS	355-46-4	3.55	0.461	2.43	3.89	J	B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
6:2 FTS	27619-97-2	4.03	0.993	2.48	3.97		B8F0041	08-Jun-18	0.252 L	12-Jun-18 09:10	1
PFOA	335-67-1	43.2	0.317	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFHpS	375-92-8	ND	0.456	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFNA	375-95-1	ND	0.394	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFOSA	754-91-6	ND	0.861	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFOS	1763-23-1	13.9	0.393	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFDA	335-76-2	ND	0.725	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
8:2 FTS	39108-34-4	ND	1.00	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFNS	68259-12-1	ND	1.88	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
MeFOSAA	2355-31-9	ND	0.803	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
EtFOSAA	2991-50-6	ND	0.666	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFUnA	2058-94-8	ND	0.511	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFDS	335-77-3	ND	0.598	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFDoA	307-55-1	ND	0.385	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFTrDA	72629-94-8	ND	0.240	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
PFTeDA	376-06-7	ND	0.367	2.43	3.89		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.9	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C3-PFPeA	IS	97.4	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C3-PFBS	IS	113	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C2-PFHxA	IS	93.7	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C4-PFHpA	IS	96.7	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
18O2-PFHxS	IS	100	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C2-PFOA	IS	90.5	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C5-PFNA	IS	93.7	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C8-PFOSA	IS	79.6	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C8-PFOS	IS	97.2	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C2-PFDA	IS	87.5	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
d3-MeFOSAA	IS	99.1	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
d5-EtFOSAA	IS	108	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1

Sample ID: CL1MW0414180510N

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: Lapeer
Location: 08n10e33-CL01
Matrix: Aqueous
Date Collected: 10-May-18 13:45

Laboratory Data

Lab Sample: 1800938-04
Date Received: 12-May-18 09:57
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFUnA	IS	86.1	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C2-PFDoA	IS	91.6	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1
13C2-PFTeDA	IS	77.6	50 - 150		B8E0146	23-May-18	0.257 L	03-Jun-18 06:41	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
LCL-UCL- Lower control limit - upper control limit
Results reported to the DL.
When reported, PFHxS, PFOA and PFOS 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**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
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.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
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.

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800938 Temp: 1.7, 1.9 °C
Storage ID: WR-2 Storage Secured: Yes ☑ No ☐

Project ID: **Lapeer PFAS Biosolids Investigation** PO#: **60570635** Sampler: **Stan Krenz** (name)

TAT (check one): Standard: [x] 21 days; 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
Dorin Bogdan	5/16/2018	17:30			
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: ~~FED EX~~

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s): Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List 6	PFAS List: 14	Comments
CL1MW0124180510N	5/10/18	0955	08n10e33-CL01	2	P	AQ			X							
CL1MW0324180510N	5/10/18	1125	08n10e33-CL01	2	P	AQ			X							
CL1MW0229180510N	5/10/18	1235	08n10e33-CL01	2	P	AQ			X							
CL1MW0414180510N	5/10/18	1345	08n10e33-CL01	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Revised COC - received from Dorin Bogdan 5/17/18 (JW)

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 1800938 Temp: 1.7, 1.9 °C
Storage ID: WR-2 Storage Secured: Yes [X] No [ ]

Project ID: **Lapeer** PO#: **60570635** Sampler: **Stan Krenz** (name)

TAT (check one): Standard: [x] 21 days; 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
Stan Krenz	5-11-18	1245	Bethina Benedict Bethina Benedict	05/12/18	1031
Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
Ph: (916) 673-1520; Fax: (916) 673-0106

ATTN: Jennifer Miller

Method of Shipment: ~~FED EX~~

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	PFAS Isotope Dilution: List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below	USEPA Method 537: PFOA/ PFOS	UCMR3 PFAS List:6	PFAS List: 14	Comments
CL1MW0124180510N	5/10/18	0955	Lapeer	2	P	AQ			X							
CL1MW0324180510N	5/10/18	1125	Lapeer	2	P	AQ			X							
CL1MW0229180510N	5/10/18	1235	Lapeer	2	P	AQ			X							
CL1MW0414180510N	5/10/18	1345	Lapeer	2	P	AQ			X							

Special Instructions/Comments: **Send Results and Acknowledgements to the list provided by e-mail to Vista.**

SEND DOCUMENTATION AND RESULTS TO:

Name: **Stephanie Kammer**
Company: **MDEQ**
Address: **525 W. Allegan Street**
City: **Lansing** State: **MI** Zip: **48909**
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, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other:

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800938 **TAT** std

Samples Arrival:	**Date/Time** 05/12/18 0957	**Initials:**	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 05/12/18 1246	**Initials:**	**Location:** WR-2 **Shelf/Rack:** E-4

Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None

Temp °C: 1.8 (uncorrected)	**Time:** 1028		**Thermometer ID:** IR-4
Temp °C: 1.7 (corrected)	**Probe used:** Yes ☒ No ☐		

	YES	NO	NA
Adequate Sample Volume Received?			
Holding Time Acceptable?			
Shipping Container(s) Intact?			
Shipping Custody Seals Intact?			
Shipping Documentation Present?			
Airbill 1 of 2 Trk # 7722 1188 4532			
Sample Container Intact?			
Sample Custody Seals Intact?			
Chain of Custody / Sample Documentation Present?			
COC Anomaly/Sample Acceptance Form completed?			
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			

Preservation Documented:	$Na_2S_2O_3$	Trizma	None	Yes	No	NA
Shipping Container	Vista	Client	Retain	Return	Dispose	

Comments:

Vista Analytical Laboratory

Sample Log-in Checklist

Vista Work Order #: 1800938 **TAT** std

Samples Arrival:	**Date/Time** 05/12/18 0957	**Initials:** BLB	**Location:** WR-2 **Shelf/Rack:** NA
Logged In:	**Date/Time** 05/12/18 1246	**Initials:** MWS	**Location:** WR-2 **Shelf/Rack:** ~~N/A~~ MWS E-4

Delivered By:	(FedEx)	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	(Ice)		Blue Ice		Dry Ice		None

Temp °C: 2.0 (uncorrected)	**Time:** 1034	**Thermometer ID:** IR-4
Temp °C: 1.9 (corrected)	**Probe used:** Yes☐ No☑	

	YES	NO	NA
Adequate Sample Volume Received?	MWS		
Holding Time Acceptable?	MWS		
Shipping Container(s) Intact?	BLB		
Shipping Custody Seals Intact?	BLB		
Shipping Documentation Present?	BLB		
Airbill 2 of 2 Trk # 7722 1188 4554	BLB		
Sample Container Intact?	MWS		
Sample Custody Seals Intact?			MWS
Chain of Custody / Sample Documentation Present?		BLB	
COC Anomaly/Sample Acceptance Form completed?		MWS	MWS
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			MWS

Preservation Documented:	$Na_2S_2O_3$	Trizma	(None)	Yes	(No)	(NA)
Shipping Container	(Vista)	Client	(Retain)	Return	Dispose	

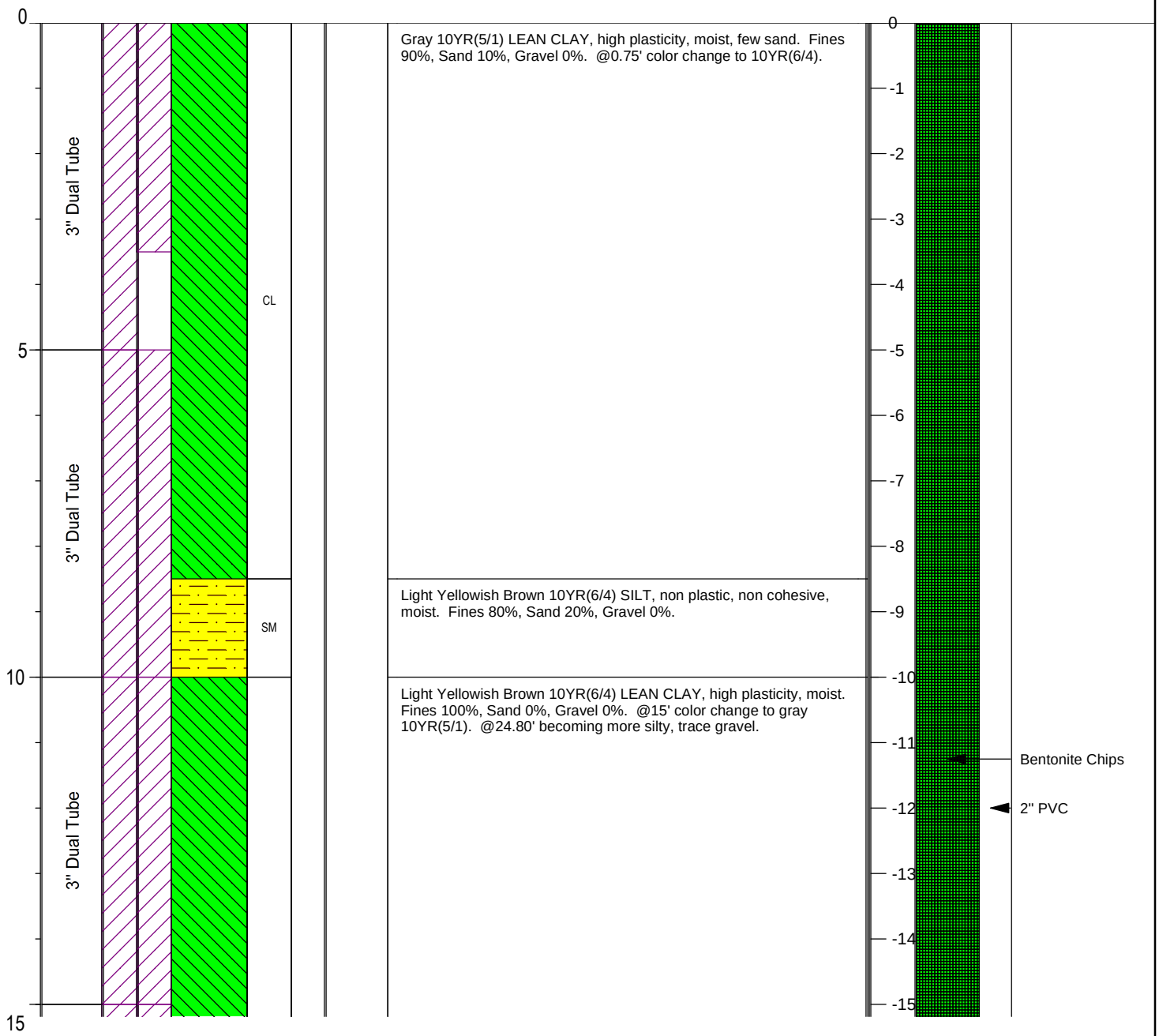
Comments:

Appendix B

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-MW1**
TOTAL DEPTH: **30'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube/ 4.25" Hollow Stem Auger**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**6.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/3/18 0915**
		DATE END:	**5/3/18 1240**



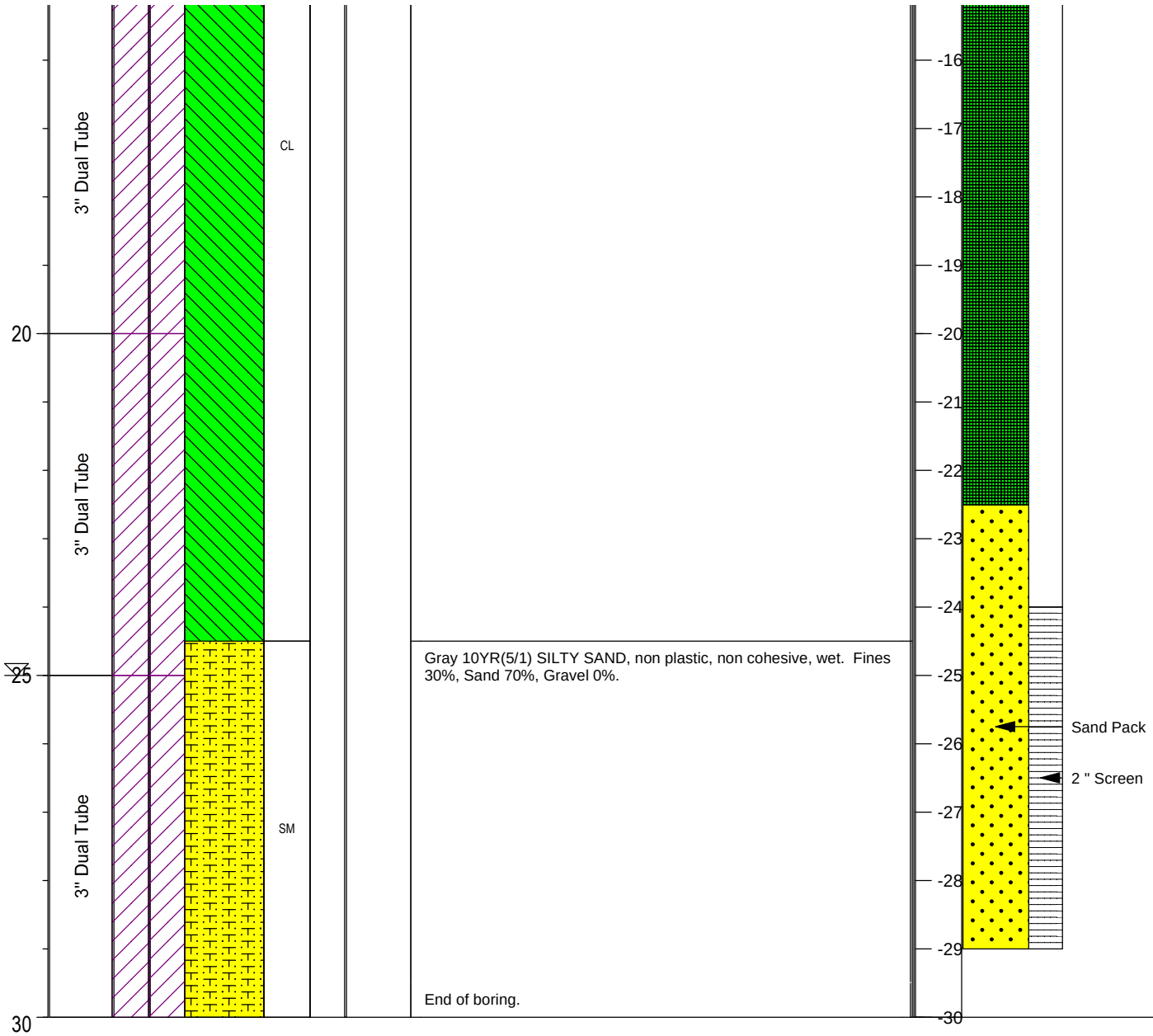
NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-MW1**
TOTAL DEPTH: **30'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube/ 4.25" Hollow Stem Auger**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**6.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/3/18 0915**
		DATE END:	**5/3/18 1240**



NOTES:

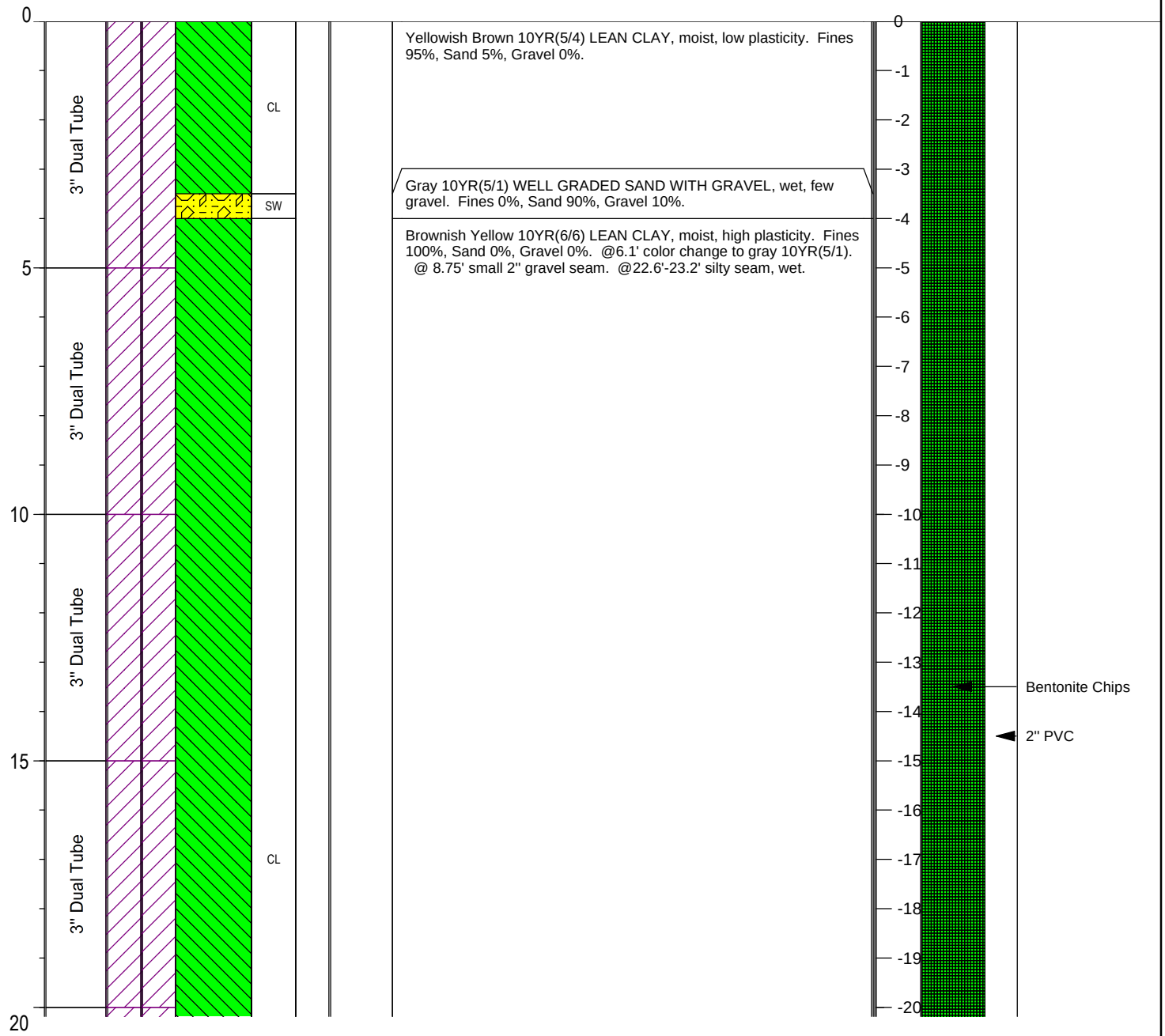
Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-MW2**
TOTAL DEPTH: **35'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube/ 4.25" Hollow Stem Auger**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**6.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/4/18 0935**
		DATE END:	**5/5/18 1450**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	PID (ppm)	SOIL DESCRIPTION	WELL CONSTRUCTION
0	3" Dual Tube			CL		Yellowish Brown 10YR(5/4) LEAN CLAY, moist, low plasticity. Fines 95%, Sand 5%, Gravel 0%.	
				SW		Gray 10YR(5/1) WELL GRADED SAND WITH GRAVEL, wet, few gravel. Fines 0%, Sand 90%, Gravel 10%.	
5	3" Dual Tube					Brownish Yellow 10YR(6/6) LEAN CLAY, moist, high plasticity. Fines 100%, Sand 0%, Gravel 0%. @6.1' color change to gray 10YR(5/1). @ 8.75' small 2" gravel seam. @22.6'-23.2' silty seam, wet.	
10	3" Dual Tube						
15	3" Dual Tube			CL			
20							



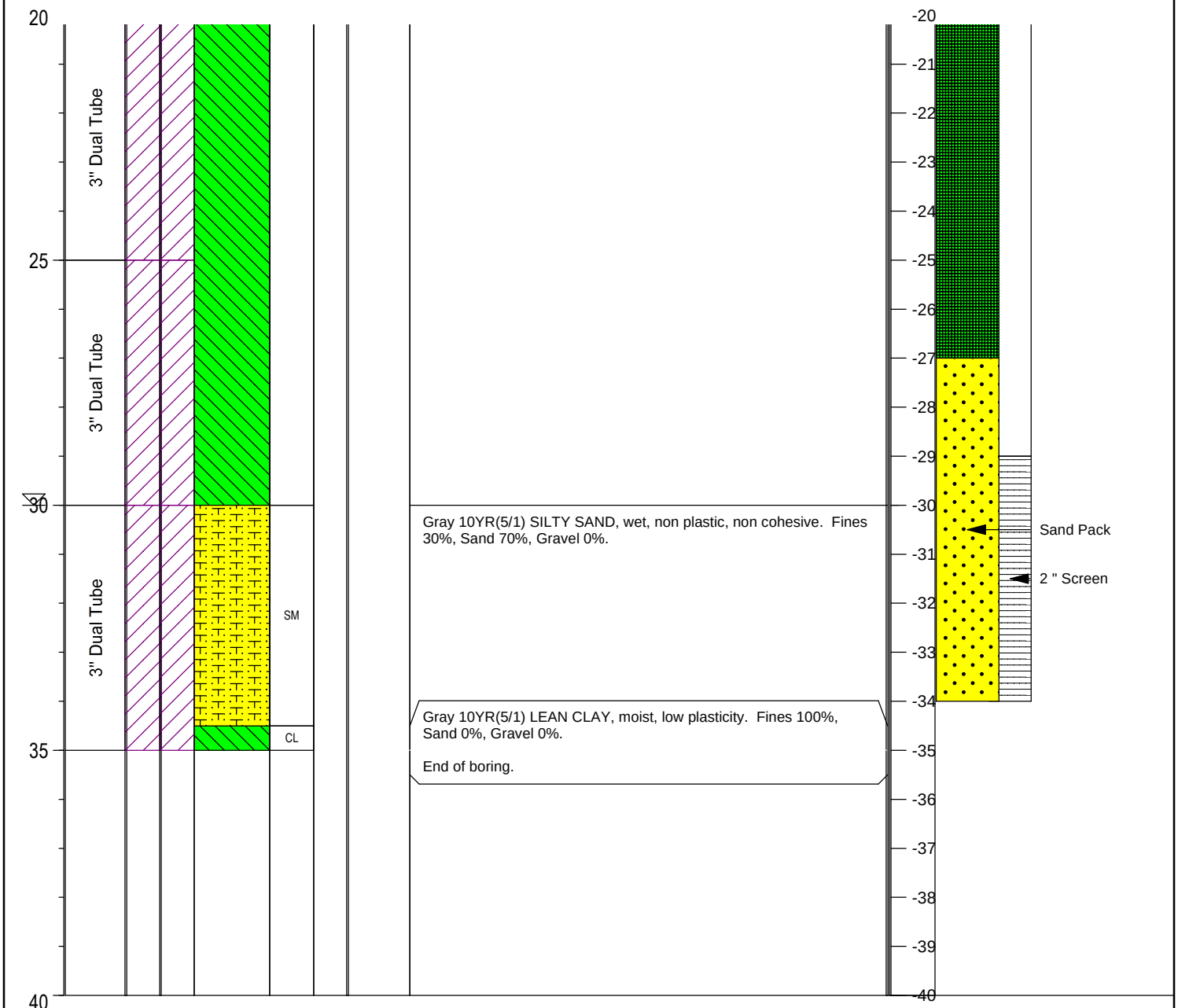
NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-MW2**
TOTAL DEPTH: **35'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube/ 4.25" Hollow Stem Auger**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**6.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/4/18 0935**
		DATE END:	**5/5/18 1450**



NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-MW3**
TOTAL DEPTH: **30'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube/ 4.25" Hollow Stem Auger**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**6.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/3/18 1430**
		DATE END:	**5/3/18 1730**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	PID (ppm)	SOIL DESCRIPTION	WELL CONSTRUCTION
0	3" Dual Tube			SM		Gray 10YR(5/1) SILTY SAND, moist, non plastic, non cohesive, few small gravel. Fines 20%, Sand 80%, Gravel 0%.	0
				SW		Brownish Yellow 10YR(6/6) WELL GRADED SAND WITH GRAVEL, moist. Fines 0%, Sand 70%, Gravel 30%.	-1
						Brownish Yellow 10YR(6/6) LEAN CLAY, moist, low plasticity. Fines 100%, Sand 0%, Gravel 0%. @5' high plasticity. @14' gradual color change to gray 10YR(5/1). @22'-23' moist, few sand. Fines 95%, Sand 5%, Gravel 0%.	-2
							-3
							-4
5	3" Dual Tube						-5
							-6
							-7
							-8
							-9
10	3" Dual Tube						-10
							-11
							-12
							-13
							-14
15				CL			-15

Bentonite Chips

2" PVC

NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-MW3**
TOTAL DEPTH: **30'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube/ 4.25" Hollow Stem Auger**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**6.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/3/18 1430**
		DATE END:	**5/3/18 1730**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	PID (ppm)	SOIL DESCRIPTION	WELL CONSTRUCTION
0–20	3" Dual Tube						
20–25	3" Dual Tube						
25–30	3" Dual Tube			SM		Gray 10YR(5/1) SILTY SAND, wet, non plastic, non cohesive. Fines 30%, Sand 70%, Gravel 0%.	Sand Pack; 2 " Screen
30						End of boring.	

NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-MW4**
TOTAL DEPTH: **20'**

PROJECT INFORMATION		DRILLING INFORMATION	
PROJECT:	**Lapeer Plating**	CONTRACTOR:	**Job Site Services**
SITE LOCATION:	**Lapeer, MI**	CREW CHIEF:	**Dave Mokma**
PROJECT NO.:	**60570635**	DRILL RIG TYPE:	**Geoprobe 7720DT**
PROJECT MANAGER:	**John Cuthbertson**	DRILLING METHOD:	**3" Dual Tube/ 4.25" Hollow Stem Auger**
LOGGED BY:	**Stan Krenz**	HOLE DIAMETER:	**6.25"**
CREATED BY:	**Stan Krenz**	DATE START:	**5/7/18 0850**
		DATE END:	**5/7/18 1015**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	PID (ppm)	SOIL DESCRIPTION	WELL CONSTRUCTION
0	3" Dual Tube		SP	SP		Dark Brown 10YR(3/3) POORLY GRADED SAND, moist, trace gravel. Fines 0%, Sand 100%, Gravel 0%.	0
			SW	SW		Brownish Yellow 10YR(6/6) WELL GRADED SAND WITH GRAVEL, moist. Fines 0%, Sand 80%, Gravel 20%.	-1
						Brownish Yellow 10YR(6/6) LEAN CLAY, moist. Fines 100%, Sand 0%, Gravel 0%.	-2
							-3
							-4
5	3" Dual Tube			CL			-5
							-6 Bentonite Chips
							-7 2" PVC
							-8
							-9
10	3" Dual Tube						-10
							-11
							-12
							-13
							-14
15	3" Dual Tube			SM		Gray 10YR(5/1) SILTY FINE SAND, wet, non plastic, non cohesive. Fines 30%, Sand 70%, Gravel 0%.	-15 Sand Pack
							-16 2 " Screen
							-17
							-18
						End of boring.	-19
20							-20

NOTES:

▽ Water level during drilling ▼ Water level in completed well

FIELD BOREHOLE LOG

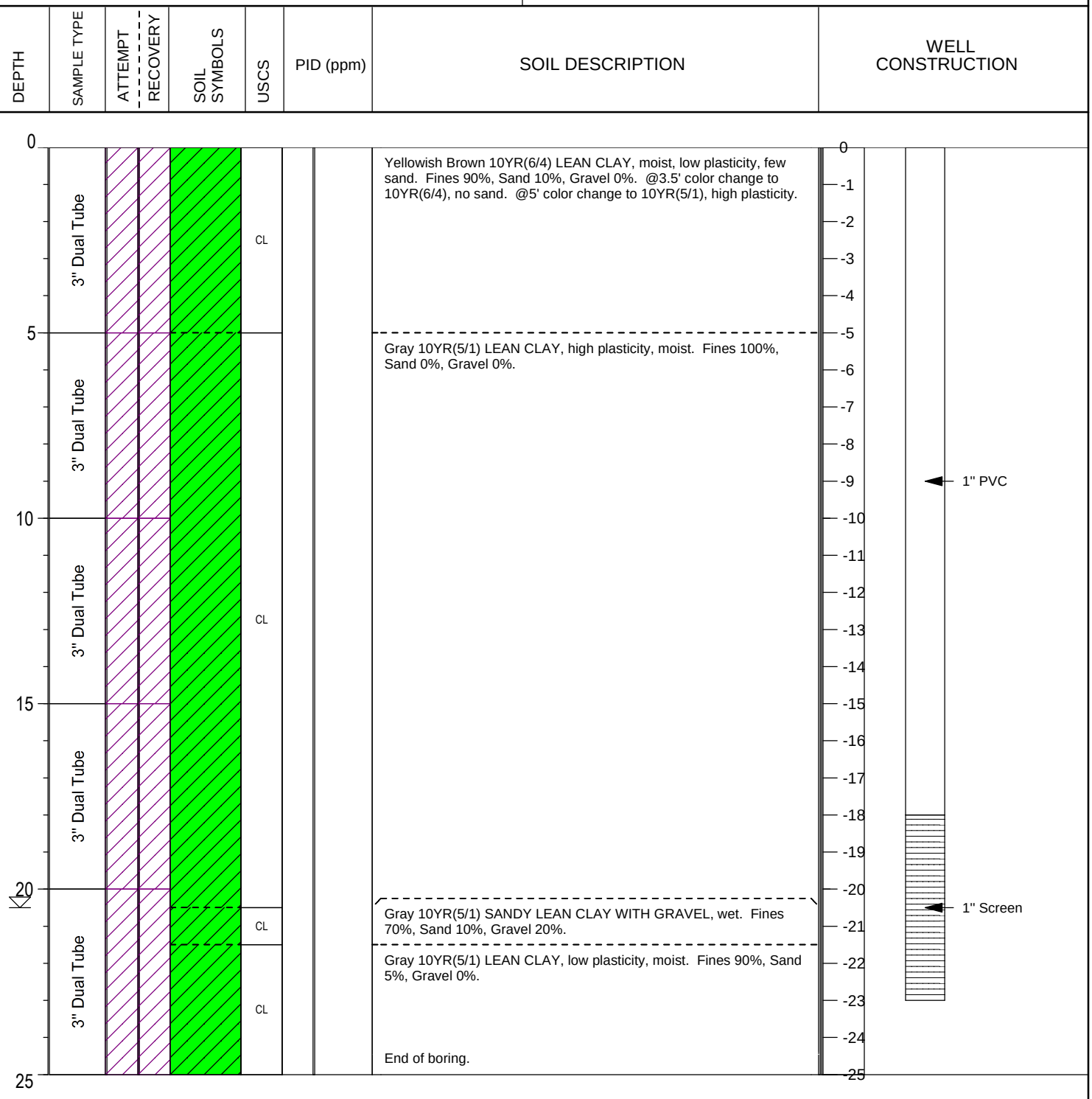
BOREHOLE NO: **CL1-TMW1**
TOTAL DEPTH: **25'**

PROJECT INFORMATION

PROJECT:	**Lapeer Plating**
SITE LOCATION:	**Lapeer, MI**
PROJECT NO.:	**60570635**
PROJECT MANAGER:	**John Cuthbertson**
LOGGED BY:	**Stan Krenz**
CREATED BY:	**Stan Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Job Site Services**
CREW CHIEF:	**Dave Mokma**
DRILL RIG TYPE:	**Geoprobe 7720DT**
DRILLING METHOD:	**3" Dual Tube**
HOLE DIAMETER:	**3.25"**
DATE START:	**5/3/18 0700**
DATE END:	**5/3/18 0900**



NOTES:

Water level during drilling Water level in completed well

FIELD BOREHOLE LOG

BOREHOLE NO: **CL1-TMW2**
TOTAL DEPTH: **10'**

PROJECT INFORMATION

PROJECT:	**Lapeer Plating**
SITE LOCATION:	**Lapeer, MI**
PROJECT NO.:	**60570635**
PROJECT MANAGER:	**John Cuthbertson**
LOGGED BY:	**Stan Krenz**
CREATED BY:	**Stan Krenz**

DRILLING INFORMATION

CONTRACTOR:	**Job Site Services**
CREW CHIEF:	**Dave Mokma**
DRILL RIG TYPE:	**Geoprobe 7720DT**
DRILLING METHOD:	**3" Dual Tube**
HOLE DIAMETER:	**3.25"**
DATE START:	**5/4/18 0720**
DATE END:	**5/4/18 0815**

DEPTH	SAMPLE TYPE	ATTEMPT / RECOVERY	SOIL SYMBOLS	USCS	PID (ppm)	SOIL DESCRIPTION	WELL CONSTRUCTION
0	3" Dual Tube			SP		Very Dark Grayish Brown 10YR(3/2) POORLY GRADED SAND, moist, few fines. Fines 20%, Sand 80%, Gravel 0%.	
				SW		Brownish Yellow 10YR(6/6) WELL GRADED SAND WITH GRAVEL, moist, few gravel. Fines 0%, Sand 80%, Gravel 20%.	
				CL		Brownish Yellow 10YR(6/6) LEAN CLAY, moist, low plasticity. Fines 100%, Sand 0%, Gravel 0%.	1" PVC
5 ▽				SW		Brownish Yellow 10YR(6/6) WELL GRADED SAND WITH GRAVEL, moist, few gravel. Fines 0%, Sand 80%, Gravel 20%.	
	3" Dual Tube			CL		Gray 10YR(5/1) LEAN CLAY, high plasticity, moist. Fines 100%, Sand 0%, Gravel 0%.	1" Screen
10						End of boring.	

NOTES:

▽ Water level during drilling ▼ Water level in completed well

Appendix C

Site 08n10e33-CL01
Soil Survey Descriptions

Celina loam, 2 to 6 percent slopes (CeB).—This soil is on low moraines. The slopes are uniform and of medium length, and the relief is commonly gently undulating. In some areas the plow layer contains small amounts of yellowish-brown clay loam plowed up from the subsoil, and in some places the plow layer consists of sandy loam rather than loam. Included in mapping were small areas of level Celina loam. Also included were small areas of the darker colored Conover and Brookston soils in low areas and drainageways. These two included soils dry out slowly in spring and after rain.

Conover loam, 2 to 6 percent slopes (CvB).—This soil is on till plains in the southern part of the county. It has medium-length to long slopes, predominantly of 4 to 6 percent. Small areas of level Conover soils were included in mapping. Also included were small areas of moderately eroded Conover soils on the crests of 5 to 6 percent slopes. In some of these eroded areas, the plow layer is grayish brown and contains small amounts of yellowish-brown clay loam plowed up from the subsoil; in others, the surface layer is sandy loam. Included areas of Brookston soils occupy drainageways; these soils stay wet longer than the surrounding Conover soils.

Artificial drainage is needed to remove excess water. Undulating relief makes it difficult to plan a complete drainage system for some areas, but random tile and surface drains are effective in such places. If tilled when wet, the soil puddles, loses its granular structure, and dries out hard and cloddy, but after it has been drained and has dried out, it is easy to work and to keep in good tilth.

Most of this soil is farmed intensively. Corn, sugar beets, small grain, and forage crops are suitable crops. (Capability unit IIw–5 (2.5b); woodland suitability group Z)

Del Rey silt loam, 0 to 2 percent slopes (DrA).—This soil is on lake plains in the central part of the county. In places the plow layer is very dark grayish brown rather than dark grayish brown. Included with this level soil in mapping were small areas of gently sloping Del Rey soils. Also included were small areas of Lenawee soils in narrow drainageways and small depressions. These included Lenawee soils stay wet longer than the adjacent Del Rey soil.

Excessive wetness and poor to fair tilth are the main limitations for farming.

If drained, this soil is suited to corn, sugar beets, and forage crops. Most of it is drained and intensively farmed. (Capability unit IIw–2 (1.5b); woodland suitability group Z)

Del Rey silt loam, 2 to 6 percent slopes (DrB).—This soil is on lake plains in the central part of the county. Small areas of level Del Rey soils are included in the areas mapped. Also included are spots of moderately eroded Del Rey soils, in which part of the yellowish-brown layer of the subsoil is mixed into the plow layer.

Excessive wetness and poor to fair tilth are the main limitations for farming. Some areas have undulating relief, which makes it difficult to lay out a complete drainage system.

If drained, this soil is suited to corn, sugar beets, and forage crops. Most of it is drained and intensively farmed. (Capability unit IIw–3 (1.5b); woodland suitability group Z)

Lenawee silty clay loam (0 to 1 percent slopes) (le).—This soil is on lake plains in the central and southern parts of the county. The plow layer is very dark brown to black and in some areas contains a little dark grayish-brown and olive-brown silty clay loam plowed up from the subsoil.

Excessive wetness and poor tilth are the main limitations for farming. The soil dries out slowly in spring and after rain in other seasons. If tilled when wet it puddles and compacts and then dries out hard and cloddy. Farm machinery bogs down readily. Tile and open ditches are needed to improve drainage, and diversions are needed to intercept runoff from adjoining higher soils. Frost damage to crops is a hazard.

Morley clay loam, 6 to 12 percent slopes, severely eroded (MuC3).—This soil occurs as small areas on moraines throughout the county. It has short, irregular slopes. The brown plow layer is a mixture of subsoil material and what remains of the original surface layer. It is less fertile, contains less organic matter, and has poorer tilth than the plow layer of uneroded Morley soils. It puddles if worked when too wet and then crusts and cracks when it dries out. Germination of seeds is uneven, and stands of plants are poor. In some areas the subsoil is exposed, and a few of the natural drainageways are gullied.

The main limitations of this soil are the very severe hazard of further erosion and the poor tilth that has resulted from past erosion.

All of this soil has been intensively cultivated, but now much of it is in native pasture or in brush. Close-growing crops, which help to check runoff, are better suited than row crops. (Capability unit IVe–5 (1.5a); woodland suitability group B)

Ubly sandy loam, 0 to 2 percent slopes (UbA).—This soil occurs as a few areas on outwash plains and till plains in the central and northern parts of the county. The plow layer in some areas contains a considerable amount of gravel and cobblestones.

The available water capacity is only moderate, and a shortage of water in midsummer is the main limitation for farming. Runoff is slow, and the erosion hazard is not significant.

Corn, small grain, and forage crops are the principal crops. (Capability unit IIs–2 (3/2a); woodland suitability group U)

Appendix D

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250 Apollo Drive
Chelmsford, MA 01824

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Memorandum

Project	Lapeer Area PFAS	Page 1
Laboratory	Vista Analytical Laboratory, El Dorado Hills, CA	
Laboratory Work Number	1800898	
Analyses/Method	Per- and Polyfluoroalkyl Substances (PFAS)/Vista Lab SOP No 49, Rev 10	
Validation Level	Limited	
AECOM Project Number	60570365-01	
Prepared by	Waverly Braunstein	
Reviewed by	Robert Kennedy	Completed: July 27, 2018

SUMMARY

A limited validation was performed for the samples collected on April 26, April 27, April 30, May 1, and May 2, 2018 at the Lapeer site. The samples were submitted to Vista Analytical Laboratory (Vista) in El Dorado Hills, CA for analysis. Vista reported the samples under laboratory work order number 1800898.

Sample IDs
CLIDU10100180501N
CLIDU10200180501N
CLIDU10300180501N
CLIDU20100180501N
CLIDU20200180501N
CLIDU20300180501N
CLIDU30100180502N
CLIDU30200180502N
CLIDU30300180502N
TGIDU10100180426N
TGIDU10200180427N
TGIDU10300180427N
TGIDU20100180430N
TGIDU20200180430N
TGIDU20300180430N
TGIDU30100180426N
TGIDU30200180426N
TGIDU30300180426N

Data validation activities were conducted with reference to:

- Vista Analytical Laboratory SOP: Preparation and Analysis for the Determination of Per- and Poly-Fluorinated Compounds (SOP No. 49, Revision 10);
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (January 2017); and

- USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016);

In the absence of method-specific information, laboratory quality control (QC) limits and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements:

✓	Data completeness (chain-of-custody (COC)/sample integrity
✓	Holding times and sample preservation
✓	Initial calibration/initial calibration and continuing calibration verification
✓	Laboratory method blanks/field blanks
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Ongoing precision and recovery (OPR) results
NA	Field duplicate results
✗	Extracted internal standard results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below).

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met.

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- the initial calibration (ICAL) percent relative standard deviation (%RSD) or correlation coefficient (r)/coefficient of determination (r^2) method acceptance criteria were met;
- the initial calibration verification standard (ICV) percent recovery (%R) acceptance criteria were met; and
- the continuing calibration verification standard (CCV) frequency and method acceptance criteria were met.

All QC acceptance limits were met or qualification of the data was not required.

Laboratory Method Blanks/Field Blanks

Laboratory method blanks and field blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the method blank associated with the sample in this data set. A field blank was not submitted with the sample reported in this data set.

MS/MSD Results

MS/MSD analyses were not performed on a sample in this data set. No data validation actions were taken on this basis.

OPR Results

The OPR percent recoveries were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. No data validation actions were taken on this basis.

Extracted Internal Standard Results

The extracted internal standard (IS) results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met except for the extracted IS results summarized below.

Sample ID	Extraction IS	% Recovery	QC Limits	Associated Compounds
CLIDU10100180501N	13C8-PFOSA	49.70	50 - 150	PFOSA
CLIDU20100180501N	13C3-PFBA	43.00	50 - 150	PFBA
CLIDU20200180501N	13C3-PFBA	30.40	50 - 150	PFBA
CLIDU20200180501N	13C8-PFOSA	47.50	50 - 150	PFOSA
CLIDU20300180501N	13C3-PFBA	41.10	50 - 150	PFBA
CLIDU20300180501N	13C8-PFOSA	42.70	50 - 150	PFOSA

Samples were qualified as follows (based on NFG 2016):

Criteria	Actions[1]	
	Detected	Nondetected
%R > Upper Acceptance Limit	J	UJ
%R >10% but < Lower Acceptance Limit	J	UJ
%R <10%	See below	
<10% and S/N >10:1	J	R
<10% and S/N <10:1	R	R
[1]The PFAS method is performed using isotope dilution technique; therefore, professional judgment was applied and bias codes were not included in data qualification.		

Qualified sample results are summarized in Table 1.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the level of quantitation (LOQ) but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
CLIDU20100180501N	SO	Perfluorobutanoic acid	0.497	1.38	2.77	ng/g	J	lc
CLIDU20100180501N	SO	Perfluorooctane sulfonamide		1.38	2.77	ng/g	UJ	lc
CLIDU20200180501N	SO	Perfluorobutanoic acid	0.646	1.17	2.33	ng/g	J	lc
CLIDU20200180501N	SO	Perfluorooctane sulfonamide	0.319	1.17	2.33	ng/g	J	lc
CLIDU20300180501N	SO	Perfluorobutanoic acid	0.572	1.22	2.44	ng/g	J	lc
CLIDU20300180501N	SO	Perfluorooctane sulfonamide	0.558	1.22	2.44	ng/g	J	lc

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas (including recovery standards)
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Extracted internal standard recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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Chelmsford, MA 01824

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Memorandum

Project	Lapeer Area PFAS	Page 1
Laboratory	Vista Analytical Laboratory, El Dorado Hills, CA	
Laboratory Work Number	1800937	
Analyses/Method	Per- and Polyfluoroalkyl Substances (PFAS)/Vista Lab SOP No 49, Rev 10	
Validation Level	Limited	
AECOM Project Number	60570365-01	
Prepared by	Paula DiMattei	
Reviewed by	Robert Kennedy	Completed: July 27, 2018

SUMMARY

A limited validation was performed for the samples collected on May 3, 4, 8, and 9, 2018 at the Lapeer site. The samples were submitted to Vista Analytical Laboratory (Vista) in El Dorado Hills, CA for analysis. Vista reported the samples under laboratory work order number 1800937.

Sample IDs
CL1DR0100180508N
CL1DR0200180509N
CL1DR0300180508N
CL1SW0100180509N
CL1SW0200180509N
CL1SW0300180508N
CL1SW0400180508N
CL1SW0500180508N
CL1TMW0118180503N
CL1TMW0405180504N

Data validation activities were conducted with reference to:

- Vista Analytical Laboratory SOP: Preparation and Analysis for the Determination of Per- and Poly-Fluorinated Compounds (SOP No. 49, Revision 10);
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (January 2017); and
- USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016);

In the absence of method-specific information, laboratory quality control (QC) limits and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements:

✓	Data completeness (chain-of-custody (COC)/sample integrity
✗	Holding times and sample preservation
✓	Initial calibration/initial calibration and continuing calibration verification
✓	Laboratory method blanks/field blanks
NA	Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✓	Ongoing precision and recovery (OPR) results
NA	Field duplicate results
✗	Extracted internal standard results
✓	Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were qualified as estimated due to nonconformances of certain QC criteria (see discussion below).

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria. All samples were initially extracted and analyzed within holding times. However, samples CL1DR0200180509N and CL1TMW0405180504N were re-extracted outside of holding time because perfluoroundecanoic acid and perfluorodecane sulfonic acid were detected in the these samples in the original analysis and the recoveries in the associated OPR exceeded the upper acceptance limits. These results were reported from the re-extraction as they were associated with compliant OPR recoveries. Professional judgment, as stipulated in the NFG, was applied to qualify these results as estimated (J).

Initial Calibration/Initial and Continuing Calibration Verification

Calibration data were reviewed for conformance with the QC acceptance criteria to ensure that:

- the initial calibration (ICAL) percent relative standard deviation (%RSD) or correlation coefficient (r)/coefficient of determination (r^2) method acceptance criteria were met;
- the initial calibration verification standard (ICV) percent recovery (%R) acceptance criteria were met; and
- the continuing calibration verification standard (CCV) frequency and method acceptance criteria were met.

All QC acceptance limits were met or qualification of the data was not required.

Laboratory Method Blanks/Field Blanks

Laboratory method blanks and field blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the method blank associated with the sample in this data set. A field blank was not submitted with the sample reported in this data set.

MS/MSD Results

MS/MSD analyses were not performed on a sample in this data set. No data validation actions were taken on this basis.

OPR Results

The OPR percent recoveries were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. No data validation actions were taken on this basis.

Extracted Internal Standard Results

The extracted internal standard (IS) results were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met except for the extracted IS results summarized below.

Sample ID	Extraction IS	% Recovery	QC Limits	Associated Compounds
CL1DR0200180509N	13C8PFOSA	41.4	50 – 150	PFOSA
CL1TMW0118180503N	13C8PFOSA	45.2	50 – 150	PFOSA
CL1TMW0405180504N	13C8PFOSA	34.3	50 – 150	PFOSA

Samples were qualified as follows (based on NFG 2016):

Criteria	Actions[1]	
	Detected	Nondetected
%R > Upper Acceptance Limit	J	UJ
%R >10% but < Lower Acceptance Limit	J	UJ
%R <10%	See below	

Criteria	Actions[1]	
	Detected	Nondetected
<10% and S/N >10:1	J	R
<10% and S/N <10:1	R	R
[1]The PFAS method is performed using isotope dilution technique; therefore, professional judgment was applied and bias codes were not included in data qualification.		

Qualified sample results are summarized in Table 1.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the level of quantitation (LOQ) but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
CL1DR0200180509N	WG	Perfluorooctane sulfonamide		2.51	4.01	ng/l	UJ	lc
CL1DR0200180509N	WG	Perfluoroundecanoic acid	2.41	2.49	3.98	ng/l	J	h
CL1DR0200180509N	WG	Perfluorodecanesulfonic acid	1.17	2.49	3.98	ng/l	J	h
CL1TMW0118180503N	WG	Perfluorooctane sulfonamide		2.47	3.96	ng/l	UJ	lc
CL1TMW0405180504N	WG	Perfluorooctane sulfonamide	12.1	2.47	3.96	ng/l	J	lc
CL1TMW0405180504N	WG	Perfluoroundecanoic acid	10.0	2.45	3.93	ng/l	J	h
CL1TMW0405180504N	WG	Perfluorodecanesulfonic acid	2.03	2.45	3.93	ng/l	J	h

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas (including recovery standards)
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Extracted internal standard recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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Memorandum

Project	Lapeer Area PFAS	Page 1
Laboratory	Vista Analytical Laboratory, El Dorado Hills, CA	
Laboratory Work Number	1800896, 1800897, 1800899, 1800933, 1800934, 1800936, and 1800938	
Analyses/Method	Per- and Polyfluoroalkyl Substances (PFAS)/Vista Lab SOP No 49, Rev 10	
Validation Level	Level 1 Plus	
AECOM Project Number	60570365-01	
Prepared by	Waverly Braunstein	
Reviewed by	Robert Kennedy	Completed: August 5, 2018

SUMMARY

A limited validation was performed for the samples collected on April 26 through May 10, 2018 at the Lapeer site. This 'Level 1 Plus' review excluded calibration but included all batch QC elements listed below. The samples were submitted to Vista Analytical Laboratory (Vista) in El Dorado Hills, CA for analysis. Vista reported the samples under laboratory work order numbers 1800896, 1800897, 1800899, 1800933, 1800934, 1800936, and 1800938.

Work Order	Sample IDs	Laboratory ID	Matrix
1800896	SKITMW113180501N	1800896-01	Groundwater
1800896	SKITMW211180501N	1800896-02	Groundwater
1800896	SKITMW308180430N	1800896-03	Groundwater
1800896	SKITMW410180430N	1800896-04	Groundwater
1800896	SKITMW506180430N	1800896-05	Groundwater
1800896	SKITMW606180501N	1800896-06	Groundwater
1800896	EB01-180426	1800896-07	Equipment/field blank
1800896	QC-180426	1800896-08	Equipment/field blank
1800896	EB01-180427	1800896-09	Equipment/field blank
1800896	QC1-180430	1800896-10	Equipment/field blank
1800896	FB1-180430	1800896-11	Equipment/field blank
1800896	EB1-180430	1800896-12	Equipment/field blank
1800896	FB1-180502	1800896-13	Equipment/field blank
1800897	TG1TMW318180502N	1800897-01	Groundwater
1800897	TG1-2-TMW1	1800897-02	Soil
1800897	TG1-2-TMW2	1800897-03	Soil
1800897	TG1-2-TMW4	1800897-04	Soil
1800897	TG1-2-TMW5	1800897-05	Soil
1800897	TG1-2-TMW6	1800897-06	Soil
1800899	SKIDU30300180427N	1800899-01	Soil
1800899	SKIDU30200180427N	1800899-02	Soil
1800899	SKIDU30100180427N	1800899-03	Soil
1800899	SKIDU20100180427N	1800899-04	Soil
1800899	SKIDU20200180427N	1800899-05	Soil
1800899	SKIDU20300180427N	1800899-06	Soil

Work Order	Sample IDs	Laboratory ID	Matrix
1800899	SKIDU10100180427N	1800899-07	Soil
1800899	SKIDU10200180427N	1800899-08	Soil
1800899	SKIDU10300180427N	1800899-09	Soil
1800933	FB1-180503	1800933-01	Equipment/field blank
1800933	FB1-180504	1800933-02	Equipment/field blank
1800933	QC1-180504	1800933-03	Equipment/field blank
1800933	QC1-180509	1800933-04	Equipment/field blank
1800933	FB01-180509	1800933-05	Equipment/field blank
1800933	FB02-180509	1800933-06	Equipment/field blank
1800933	FB03-180509	1800933-07	Equipment/field blank
1800933	FB1-180510	1800933-08	Equipment/field blank
1800934	TG1SW0300180509N	1800934-01	Groundwater
1800934	TG1SW0200180509N	1800934-02	Groundwater
1800934	TG1SW0100180509N	1800934-03	Groundwater
1800936	SK1SW0200180509N	1800936-01	Groundwater
1800936	SK1SW0100180509N	1800936-02	Groundwater
1800936	SK1DR0300180509N	1800936-03	Groundwater
1800936	SK1DR0200180509N	1800936-04	Groundwater
1800936	SK1DR0100180509N	1800936-05	Groundwater
1800936	SK1SW0300180509N	1800936-06	Groundwater
1800936	SK1DR0400180509N	1800936-07	Groundwater
1800936	SK1DR0500180509N	1800936-08	Groundwater
1800938	CL1MW0124180510N	1800938-01	Groundwater
1800938	CL1MW0324180510N	1800938-02	Groundwater
1800938	CL1MW0229180510N	1800938-03	Groundwater
1800938	CL1MW0414180510N	1800938-04	Groundwater
1800896	SKITMW113180501N	1800896-01	Groundwater
1800896	SKITMW211180501N	1800896-02	Groundwater
1800896	SKITMW308180430N	1800896-03	Groundwater

Data validation activities were conducted with reference to:

- Vista Analytical Laboratory SoilP: Preparation and Analysis for the Determination of Per- and Poly-Fluorinated Compounds (SoilP No. 49, Revision 10);
- USEPA National Functional Guidelines for Organic Superfund Methods Data Review (January 2017); and
- USEPA National Functional Guidelines for High Resolution Superfund Methods Data Review (April 2016);

In the absence of method-specific information, laboratory quality control (QC) limits and/or professional judgment were used as appropriate.

REVIEW ELEMENTS

The data were evaluated based on the following review elements:

✓ Data completeness (chain-of-custody (COC)/sample integrity

✓ Holding times and sample preservation
✗ Laboratory method blanks/field blanks
NA Matrix spike (MS) and/or matrix spike duplicate (MSD) results
✗ Ongoing precision and recovery (OPR) results
NA Field duplicate results
✗ Extracted internal standard results
✓ Sample results/reporting issues

The symbol (✓) indicates that no validation qualifiers were applied based on this parameter. An "NA" indicates that the parameter was not included as part of this data set or was not applicable to this validation and therefore not reviewed. The symbol (✗) indicates that a QC nonconformance resulted in the qualification of data. Any QC nonconformance that resulted in the qualification of data is discussed below. In addition, nonconformances or other issues that were noted during validation, but did not result in qualification of data, may be discussed for informational purposes only.

The data appear valid as reported and may be used for decision making purposes. Select data points were negated or qualified as estimated due to nonconformances of certain QC criteria (see discussion below). No data were rejected

RESULTS

Data Completeness (COC)/Sample Integrity

The data package was reviewed and found to meet acceptance criteria for completeness:

- The COCs were reviewed for completeness of information relevant to the samples and requested analyses, and for signatures indicating transfer of sample custody.
- The laboratory sample login sheet(s) were reviewed for issues potentially affecting sample integrity, including the condition of sample containers upon receipt at the laboratory.
- Completeness of analyses was verified by comparing the reported results to the COC requests.

No significant issues were encountered.

Holding Times and Sample Preservation

Sample preservation and preparation/analysis holding times were reviewed for conformance with the QC acceptance criteria.

All samples were initially extracted and analyzed within holding times. The samples tabulated below were re-extracted outside of holding times because 6:2 Fluorotelomer sulfonic acid was detected above the quantitation limit in one or more method blanks.

SampleID
FB1-180502
TG1SW0100180509N
TG1SW0200180509N
TG1SW0300180509N
SK1DR0100180509N
SK1DR0200180509N

SampleID
SK1DR0300180509N
SK1DR0500180509N
SK1SW0100180509N
SK1SW0200180509N
SK1SW0300180509N
CL1MW0124180510N
CL1MW0229180510N
CL1MW0414180510N

Laboratory Method Blanks/Field Blanks

Laboratory method blanks and field blanks are evaluated as to whether there are contaminants detected above the detection limit (DL). Target compounds were not detected in the method blank associated with the sample in this data set. In general, method blanks were free from contamination or the associated samples were re-extracted. There were two exceptions to this resulting in the negation of perfluorooctanoic acid in sample TG1TMW318180502N, and 6:2 fluorotelomer sulfonic acid in sample CL1MW0324180510N.

Multiple field and equipment blanks were submitted with the sample reported in these data sets. The results were not used to qualify data, but were used for informational purposes only. No elevated or systematic contamination issues were noted. The following table summarizes all detected compounds in all field and equipment blanks.

Sample ID	Compound	Result (ng/L)	Quantitation Limit (ng/L)
EB01-180426	Perfluorooctanesulfonic acid	1.59	3.80
EB01-180426	Perfluorooctanoic acid	1.63	3.80
QC1-180504	Perfluoroheptanoic acid	0.432	3.89
QC1-180504	Perfluorohexanesulfonic acid	0.562	3.89
QC1-180504	Perfluorooctanesulfonic acid	0.928	3.89
QC1-180504	Perfluorooctanoic acid	1.13	3.89
FB02-180509	Perfluorooctanesulfonic acid	1.18	3.87

MS/MSD Results

MS/MSD analyses were not performed on a sample in this data set. No data validation actions were taken on this basis.

OPR Results

The OPR percent recoveries were reviewed for conformance with the QC acceptance criteria. All QC acceptance criteria were met or qualification of the data was not required, with the exception of the perfluorooctanesulfonic acid results in samples FB02-180509 and QC1-180504, which were qualified as estimated with a potential high bias due to elevated OPR recoveries.

Field Duplicate Results

Field duplicate samples were not submitted with this data set. No data validation actions were taken on this basis.

Extracted Internal Standard Results

The extracted internal standard (IS) results were reviewed for conformance with the QC acceptance criteria. In general, the recoveries met the acceptance limits. However, there were minor

nonconformances that resulted in qualification of the results as estimated (J/UJ). Details can be found in the validation worksheets.

Sample Results/Reporting Issues

If applicable, compounds detected at concentrations less than the level of quantitation (LOQ) but greater than the DL are qualified by the laboratory as estimated (J). This "J" qualifier is retained during data validation.

It should be noted that the overall bias is considered to be indeterminate in cases where cumulative nonconformances do not show a consistent bias or in cases of the presence of conflicting high and low biases.

QUALIFICATION ACTIONS

Sample results qualified as a result of validation actions are summarized in Table 1. All actions are described above.

ATTACHMENTS

Attachment A: Qualifier Codes and Explanations

Attachment B: Reason Codes and Explanations

Table 1 - Data Validation Summary of Qualified Data

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
EB01-180426	WQ	Perfluorooctane sulfonamide		2.38	3.80	ng/l	UJ	lc
EB01-180427	WQ	Perfluorooctane sulfonamide		2.57	4.11	ng/l	UJ	lc
FB1-180430	WQ	Perfluorooctane sulfonamide		2.37	3.79	ng/l	UJ	lc
FB1-180502	WQ	Perfluorooctanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoroundecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorooctane sulfonamide		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	4:2 FLUOROTELOMER SULFONIC ACID		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	PERFLUORONONANE SULFONIC ACID		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorotridecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorotetradecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	8:2 Fluorotelomer sulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoroheptanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorononanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorobutanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoroheptanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorohexanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorobutanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorodecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorodecanesulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorododecanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorooctanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	EtFOSAA		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluorohexanoic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	PERFLUOROPENTANE SULFONIC ACID		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	6:2 Fluorotelomer sulfonic acid		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	MeFOSAA		2.44	3.91	ng/l	UJ	h
FB1-180502	WQ	Perfluoropentanoic acid		2.44	3.91	ng/l	UJ	h
QC1-180430	WQ	Perfluorooctane sulfonamide		2.38	3.80	ng/l	UJ	lc
QC-180426	WQ	Perfluorooctane sulfonamide		2.41	3.86	ng/l	UJ	lc
SKITMW113180501N	WG	Perfluorooctane sulfonamide		2.39	3.82	ng/l	UJ	lc
SKITMW113180501N	WG	Perfluorobutanesulfonic acid	11.2	2.39	3.82	ng/l	J	lc
SKITMW211180501N	WG	Perfluorobutanesulfonic acid	44.9	2.39	3.82	ng/l	J	lc
SKITMW308180430N	WG	Perfluorooctane sulfonamide		2.53	4.05	ng/l	UJ	lc
SKITMW410180430N	WG	Perfluorooctane sulfonamide		2.41	3.86	ng/l	UJ	lc
SKITMW506180430N	WG	Perfluorobutanesulfonic acid	9.97	2.41	3.86	ng/l	J	lc
TG1TMW318180502N	WG	Perfluorooctanoic acid		3.96	3.96	ng/l	U	bl
TG1-2-TMW1	SO	Perfluorooctane sulfonamide		1.08	2.15	ng/g	UJ	lc
TG1-2-TMW1	SO	Perfluorobutanoic acid		1.08	2.15	ng/g	UJ	lc
TG1-2-TMW2	SO	Perfluorooctane sulfonamide		1.05	2.10	ng/g	UJ	lc
TG1-2-TMW2	SO	Perfluorobutanoic acid		1.05	2.10	ng/g	UJ	lc

Sample ID	Matrix	Compound	Result	LOD	LOQ	Units	Validation Qualifiers	Validation Reason
TG1-2-TMW4	SO	Perfluorooctane sulfonamide		1.05	2.10	ng/g	UJ	lc
TG1-2-TMW5	SO	Perfluorooctane sulfonamide		1.09	2.19	ng/g	UJ	lc
TG1-2-TMW5	SO	Perfluorobutanoic acid		1.09	2.19	ng/g	UJ	lc
TG1-2-TMW6	SO	Perfluorooctane sulfonamide		1.04	2.08	ng/g	UJ	lc
TG1-2-TMW6	SO	Perfluorobutanoic acid		1.04	2.08	ng/g	UJ	lc
FB01-180509	WQ	Perfluorooctane sulfonamide		2.38	3.80	ng/l	UJ	lc
FB02-180509	WQ	Perfluorooctanesulfonic acid	1.18	2.42	3.87	ng/l	J+	l
FB02-180509	WQ	Perfluorooctane sulfonamide		2.42	3.87	ng/l	UJ	lc
FB03-180509	WQ	Perfluorooctane sulfonamide		2.40	3.85	ng/l	UJ	lc
FB1-180503	WQ	Perfluorooctane sulfonamide		2.41	3.86	ng/l	UJ	lc
FB1-180504	WQ	Perfluorooctane sulfonamide		2.45	3.93	ng/l	UJ	lc
FB1-180510	WQ	Perfluorooctane sulfonamide		2.44	3.91	ng/l	UJ	lc
QC1-180504	W	Perfluorooctanesulfonic acid	0.928	2.43	3.89	ng/l	J+	l
QC1-180504	W	Perfluorooctane sulfonamide		2.43	3.89	ng/l	UJ	lc
QC1-180509	W	Perfluorooctane sulfonamide		2.43	3.89	ng/l	UJ	lc
TG1SW0100180509N	WG	Perfluorooctanesulfonic acid	1.64	2.63	4.20	ng/l	J+	l
TG1SW0100180509N	WG	Perfluorotridecanoic acid		2.63	4.20	ng/l	UJ	lc
TG1SW0100180509N	WG	Perfluorotetradecanoic acid		2.63	4.20	ng/l	UJ	lc
TG1SW0100180509N	WG	6:2 Fluorotelomer sulfonic acid		2.48	3.97	ng/l	UJ	h
TG1SW0200180509N	WG	EtFOSAA		2.48	3.96	ng/l	UJ	lc
TG1SW0200180509N	WG	MeFOSAA		2.48	3.96	ng/l	UJ	lc
TG1SW0200180509N	WG	6:2 Fluorotelomer sulfonic acid		2.50	4.00	ng/l	UJ	h
TG1SW0300180509N	WG	Perfluorooctane sulfonamide		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	Perfluorotridecanoic acid		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	Perfluorotetradecanoic acid		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	EtFOSAA		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	MeFOSAA		2.49	3.99	ng/l	UJ	lc
TG1SW0300180509N	WG	6:2 Fluorotelomer sulfonic acid	9.90	2.53	4.05	ng/l	J-	h
SK1DR0100180509N	WG	6:2 Fluorotelomer sulfonic acid	4.93	2.55	4.08	ng/l	J	h
SK1DR0200180509N	WG	6:2 Fluorotelomer sulfonic acid	6.28	2.45	3.92	ng/l	J	h
SK1DR0300180509N	WG	6:2 Fluorotelomer sulfonic acid		2.56	4.10	ng/l	UJ	h
SK1DR0500180509N	WG	6:2 Fluorotelomer sulfonic acid	10.6	2.48	3.97	ng/l	J	h
SK1SW0100180509N	WG	6:2 Fluorotelomer sulfonic acid		2.47	3.95	ng/l	UJ	h
SK1SW0200180509N	WG	6:2 Fluorotelomer sulfonic acid		2.57	4.12	ng/l	UJ	h
SK1SW0300180509N	WG	6:2 Fluorotelomer sulfonic acid		2.48	3.97	ng/l	UJ	h
CL1MW0124180510N	WG	6:2 Fluorotelomer sulfonic acid		2.38	3.81	ng/l	UJ	h
CL1MW0229180510N	WG	6:2 Fluorotelomer sulfonic acid		2.50	4.00	ng/l	UJ	h
CL1MW0324180510N	WG	6:2 Fluorotelomer sulfonic acid		3.96	3.96	ng/l	U	bl
CL1MW0414180510N	WG	6:2 Fluorotelomer sulfonic acid	4.03	2.48	3.97	ng/l	J	h

Attachment A

Qualifier Codes and Explanations

Qualifier	Explanation
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
J-	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential low bias.
J+	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample with a potential high bias.
JN	The analyte was tentatively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
U	The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Attachment B

Reason Codes and Explanations

Reason Code	Explanation
be	Equipment blank contamination
bf	Field blank contamination
bl	Laboratory blank contamination
c	Calibration issue
d	Reporting limit raised due to chromatographic interference
fd	Field duplicate RPDs
h	Holding times
i	Internal standard areas (including recovery standards)
k	Estimated Maximum Possible Concentration (EMPC)
l	LCS or OPR recoveries
lc	Extracted internal standard recovery
ld	Laboratory duplicate RPDs
lp	Laboratory control sample/laboratory control sample duplicate RPDs
m	Matrix spike recovery
md	Matrix spike/matrix spike duplicate RPDs
nb	Negative laboratory blank contamination
p	Chemical preservation issue
r	Dual column RPD
q	Quantitation issue
s	Surrogate recovery
su	Ion suppression
t	Temperature preservation issue
x	Percent solids
y	Serial dilution results
z	ICS results

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