Progress Report for the Response Activity Plan for PFAS

3769 Cannonsburg Road, NE
Belmont, Michigan
Site ID: 41000048

Prepared for:
Northeast Gravel Company

Project No. 181258
September 28, 2020

fishbeck
Engineers | Architects | Scientists | Constructors

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List of Abbreviations/Acronyms

µg/L	milligrams per liter
BCDC	Boulder Creek Development Company
bgs	below ground surface
CSM	conceptual site model
DWC	Drinking Water Criteria
EGLE	Michigan Department of Environment, Great Lakes, and Energy
GSI	Groundwater/Surface Water Interface
ILS	Inland Lakes and Streams
MDEQ	Michigan Department of Environmental Quality
NREPA	Natural Resources and Environmental Protection Act
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
ppt	parts per trillion
RAP	Remedial Action Plan
SOP	Standard Operating Procedure
USEPA	U.S. Environmental Protection Agency
MSL	mean sea level
PFAS	Per- and Polyfluoroalkyl Substance

1.0 Introduction

Fishbeck has prepared this Progress Report for the Response Activity Plan for the Northeast Gravel Company Site (formerly known as 4300 Cannonsburg Road), 3769 Cannonsburg Road, NE, Belmont, Kent County, Michigan; Facility ID No. 41000048 (the Site). This Progress Report has been prepared to document the scope of work that was planned, and the actual work completed under the August 29, 2019 Response Activity Plan for PFAS 3769 Cannonsburg Road, NE Belmont, Michigan Site ID: 41000048 dated August 29, 2019. Recommendations for additional investigation activities are presented in Section 5.0. The site location is shown on Figure 1S – Site Plan South, and Figure 1N - Site Plan North.

The August 29, 2019, Response Activity Plan presented and summarized existing information related to the site history, site geology, site hydrogeology, and groundwater flow and developed a preliminary conceptual site model (CSM). The CSM is continually updated as new data is developed and serves as an ongoing guide for site investigation activities as additional site investigation data are generated throughout this response activity. The Response Activity Plan presented an initial scope of work to begin to evaluate the Part 201 obligations under the Natural Resources and Environmental Protection Act (NREPA) 1994 PA 451, as amended. The goals of the work described in the Response Activity Plan were to meet Part 201 requirements related to site characterization and potential response activities.

During the preparation of this Progress Report, the State of Michigan has developed new regulatory criteria for per- and polyfluoroalkyl substances (PFAS). Maximum contaminant levels (MCLs) have been developed for seven PFAS compounds. These MCL values result in new Part 201 drinking water criteria for perfluorooctanoic acid (PFOA) (8 milligrams per liter [µg/L]) and perfluorooctane sulfonate (PFOS) (16 µg/L). The data generated and evaluated in this report are compared to the new MCL values and Part 201 criteria, as applicable.

Section 5.0 of this progress report recommends additional work to be conducted. Following discussion and approval by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), a work plan will be prepared and submitted to EGLE for final approval.

2.0 Background and Site History

The Site, as it exists today, comprises three separate operation areas. The western area of the Site is an active sand and gravel mine that is operated by the Grand Rapids Gravel Company (GRGC) (see Figure 1S). The eastern area of the Site was previously a sand and gravel mine and landfill area owned and operated by Northeast Gravel Company. The mining and landfill operations in the eastern area of the Site have been completed and the landfill was closed in 1997. In that same year, Boulder Creek Development Company (BCDC) purchased the Site and redeveloped the area into a golf course and residential development (see Figure 1S). BCDC and GRGC are sister companies. The northern area of the Site, north of 7 Mile Road, is also occupied by a residential development and includes seven holes of the Boulder Creek golf course. No sand and gravel mining or landfill activities have been conducted on the northern area of the Site (see Figure 1N).

Historically, the eastern portion of the Site included a tannery waste landfill, an electroplating waste landfill, and a municipal solid waste landfill. Extensive geologic, hydrogeologic, and environmental investigations were conducted in the eastern area of the Site to meet the applicable regulations under the guidance and review of the Michigan Department of Environmental Quality (MDEQ).

The eastern area of the Site was closed by meeting all applicable Michigan Department of Natural Resources/ MDEQ requirements that were in place at the time under Act 307 and Act 451, Part 201. A Remedial Site Investigation Report was completed and submitted to the MDEQ in October 1994. A Remedial Action Plan (RAP) was completed and submitted to the MDEQ in 1995. A RAP Amendment was submitted to the MDEQ on April 1,

1996. The RAP and its amendment were approved by the MDEQ on May 8, 1996. A RAP Certification Report was completed and submitted to the MDEQ in August 1997. All site investigation work, site remedial design work, and all site remedial system construction work was reviewed for compliance based on the regulatory requirements in place at the time of each submittal. All final submittals were approved by the MDEQ as fulfilling or exceeding all applicable regulatory requirements.

Irrigation of the golf course and green spaces previously used surface water that was impacted with PFAS from the former landfill cell containing tannery sludge generated by Wolverine Worldwide. Irrigation using potentially impacted surface water was conducted at the site before May 1, 2020, when the irrigation source was changed to its new location.

The currently active sand and gravel mining operation on the western area of the Site has been investigated and is currently operating to meet all EGLE requirements under Rule 323.2221, Part 22 Rules, Part 31, of the NREPA. Additional information for the mine area is provided below (see Section 2.1), for the historic landfill area (see Section 2.2), and for the golf course and development area (see Section 2.3).

2.1 Active Mining Area

GRGC currently operates a gravel and sand mining operation at 7 Mile Road and Brewer Road in Plainfield Township, Kent County, Michigan (see Figure 1S). The mining operation includes discharge of gravel wash-water to the underlying soils. Because the wash-water includes a chemical additive to remove clay minerals from suspension, a full groundwater discharge permit was required rather than a general permit. The full permit required additional information including a hydrogeological study of the Site area pursuant to Rule 323.2221, Part 22 Rules, Part 31, of the NREPA. Since 2003, annual groundwater monitoring has been conducted at the Site as required under the groundwater discharge permit. All sand and gravel mining operations at the Site have continuously met MDEQ requirements and all investigation, monitoring, and reporting has been approved by the MDEQ.

Numerous geologic studies were conducted prior to the start of the mining operation. These studies included the completion of more than 80 borings to various depths, which were drilled at differing stages of the site development. These investigations were completed to assess the sand/gravel resources and include drilling programs conducted during 1968, 1987, and an undated event. All available logs are on file at Fishbeck. The boring logs indicated an aquifer composed almost entirely of coarse-grained sand and gravel materials; very little silt or clay material was encountered.

In 2003, Fishbeck prepared the *Hydrogeologic Investigation Report Grand Rapids Gravel Company Gravel and Sand Mining Operation 7 Mile and Brewer Roads Plainfield Township, Michigan* (May 1, 2003). The 2003 hydrogeologic investigation report containing the extensive geologic and hydrogeologic site characterization was presented to the MDEQ in the *"Per- and Polyfluoroalkyl Substances Investigation Work Plan, 3769 Cannonsburg Road, NE Belmont, Michigan Site ID:41000048 (September 12, 2018)."* The September 12, 2018, Work Plan included figures, tables, and maps illustrating the site conditions, geologic cross-sections, groundwater flow direction, monitoring well construction, laboratory results, etc.

2.2 Historic Landfill Area

The historic landfill area of the Site received and disposed of various wastes from 1966 to 1980. During this time period, three main waste disposal areas were created: (1) a tannery waste area (1966 to 1980); (2) a plating waste area (1966 to 1977); and a (3) domestic refuse area (1966 to 1977). Numerous geologic and hydrogeologic investigations were conducted resulting in the MDEQ-approved closure for all of the former landfill areas. The investigation and remediation work conducted at the Site were extensive and met MDEQ requirements specified by State law. The investigation and remedial actions at the Site were documented in the following reports prepared by Fishbeck:

Remedial Investigation Report for Northeast Gravel Company Act 307 Site Plainfield Township, Michigan (October 1994). This report was provided in Appendix 2 of the September 12, 2018, Work Plan and includes figures, tables, and maps illustrating the site conditions, geologic cross-sections, groundwater flow direction, monitoring well construction, analytical results, etc.

Remedial Action Plan for Northeast Gravel Company Act 307 Site Plainfield Township, Michigan (November 1995). This report documented the basis for selecting appropriate remedial actions for the landfill areas based on all available data. This report is on file at Fishbeck.

The closure of the former landfill areas, as specified in the remedial action plan (November 1995), is documented in the *Remedial Action Plan Certification Report Northeast Gravel Company Act 307 Site Plainfield Township, Michigan* (August 1997). This report was provided to the MDEQ in Appendix 3 of the September 12, 2018, Work Plan and included the full documentation and certification of all response actions required in the RAP. All remedial work at the Site was reviewed and approved by the MDEQ.

2.3 Golf Course, Condominiums, and Single-Family Homes

Following the completion of the soil and groundwater investigations at the Site and the closure of all landfill cells with MDEQ approval, a golf course, condominium, and single-family residential development was constructed at the Site. Development of the Site continues at this time. All residents of the Site are served by municipal drinking water and sewer service. See Figure 1N and Figure 1S.

3.0 Conceptual Site Model

3.1 Geologic Conditions in the Area South of 7 Mile Road

Based on the previous investigation work at the Site in the area south of 7 Mile Road, the native soil in the area of the Site is well documented to consist of a mixture of medium sand, to gravelly sand, to gravel. The geology in the area north of 7 Mile Road has not been previously investigated.

The thickness of the coarse-grained soils south of 7 Mile Road ranges from approximately 54 to 100 feet. The base of the sand/gravel unit is bounded by a glacial till unit. The till consists primarily of poorly sorted clay and silt with minor amounts of sand and gravel. A regionally extensive unconfined aquifer exists within the sand/gravel unit. The base of this aquifer is the till unit, which acts as an aquitard. In addition to the till unit, thin layers of clay (typically less than 1-foot thick) are also present within the sand and gravel unit. A shallow clay layer is present in the northern portion of the plating waste area that is the likely cause for the perched water pond that resides between the tannery and plating disposal areas. The geologic conditions at the Site are described in more detail and illustrated on maps and cross-sections that were previously submitted to the MDEQ in the September 12, 2018, Work Plan.

3.2 Geologic Conditions in the Area North of 7 Mile Road

Based on a limited review of Welllogic Well Logs available at www.geowebface.com, the area east of the golf course and north of 7 Mile Road is made up of a sequence of granular and cohesive soils typical of glacial moraine or ice contact glacial deposits. The residential water supply wells in this area are constructed in the glacial drift and are generally set in the depth interval between 55 and 182 feet below ground surface (bgs).

Based on a limited review of Welllogic Well Logs available at www.geowebface.com, the area west of the golf course and north of 7 Mile Road (the Bittersweet neighborhood) is made up of a sequence of granular and cohesive soils typical of glacial outwash or ice contact glacial deposits. The residential water supply wells in this area are constructed in either the glacial drift aquifer or underlying bedrock aquifer. Wells constructed in the

glacial drift aquifer are generally set in the depth interval 33 to 97 feet bgs, while wells set in the bedrock aquifer are generally set in the depth interval 160 to 201 feet bgs.

3.3 Groundwater Flow Conditions

3.3.1 Existing Conditions

Groundwater flow in the area south of 7 Mile Road is predominantly south-southwest toward the Grand River (Figure 6 of Appendix 2 from the September 2018, Work Plan). Groundwater is commonly encountered between 28 and 33 feet bgs in the disposal areas. Groundwater occurs as an unconfined, water table aquifer. The surface of the unconfined aquifer ranges from 1 to 9 feet below the bottom of the waste material. The saturated thickness of the shallow aquifer ranges from 47 to 90 feet depending on the underlying elevation of the clay aquitard. The calculated linear velocity of the groundwater flow ranges from 0.24 to 2.45 feet per day or 88 to 894 feet per year; accordingly, the groundwater travel time from the disposal areas would reach the Grand River in approximately 3.5 years.

Groundwater flow in the area north of 7 Mile Road has not previously been investigated. It is expected that the area north of 7 Mile Road overlies a largely glacial till sequence with a surface slope of the clay layer that is generally downward to the south and southwest. A shallow water table aquifer zone appears to be present in the Bittersweet neighborhood that is sufficient to support the use of the aquifer for residential water supply wells. The deeper water bearing zone in the Bittersweet neighborhood may be hydraulically connected or hydraulically isolated from the perched groundwater zone(s).

It is not currently known if a direct hydraulic connection exists between the irrigated area of the golf course north of 7 Mile Road to the surface water of Secluded Lake, or if one or more aquifer(s) might be present in the area east of the Site.

3.3.2 Proposed Inland Lake Expansion

GRGC is completing the mining of sand and gravel at the active mine area of the site. As part of the completion of mining and the future reclamation and redevelopment of the mining area, GRGC has prepared and submitted an Inland Lakes and Streams (ILS) Permit to expand the existing lake in the active mine area to be greater than five acres. The ILS Permit application was submitted to EGLE by representatives of King and MacGregor, Inc. using MiWaters on June 30, 2020. To evaluate that potential effects of the proposed lake expansion on groundwater flow, wetlands, and nearby residential water wells; and to support the ILS Permit application, Fishbeck conducted a computer model evaluation of the proposed groundwater flow conditions that would likely result under the requested ILS Permit. Based on the groundwater flow model conducted by Fishbeck, the groundwater flow conditions would be altered, but no very serious consequences would occur. Groundwater levels in the Bittersweet neighborhood showed the possibility of being affected, but mechanisms are already in place under the Plainfield Township special use permit for sand and gravel mining to ensure the continued supply of safe drinking water to each house.

Appendix 1 contains the Addendum to the Report to the *Addendum to the Hydrogeologic Investigation Report Grand Rapids Gravel Company Gravel and Sand Mining Operation 7 Mile and Brewer Roads Plainfield Township, Michigan* (May 1, 2003) that was used to support the ILS Permit application. The groundwater flow evaluation and the figures showing the resulting influence of groundwater levels following the proposed lake expansion are consistent with the existing CSM for the Site.

4.0 Scope of Work and Findings for Response Activities

The proposed response activities specified in the Response Activity Plan for PFAS dated August 29, 2019, included the following:

- Changing the existing irrigation system at the Site to first reduce the use of potentially PFAS-impacted water for irrigation and ultimately eliminate the use of potentially PFAS-impacted water for irrigation.
- Sampling residential water wells at homes located along or north of 7 Mile Road that are potentially vulnerable to PFAS impact from the past irrigation practices at the Site.
- Conducting groundwater investigation activities to fulfill the applicable Part 201 requirements.
- Providing alternate water supply or filter equipment to any groundwater-use locations that are found to exceed applicable Part 201 criteria that are directly attributed to past irrigation practices at the golf course.

The scope of work for these response activities anticipated the likely location of residential wells to sample, monitoring wells to be installed, groundwater samples to be collected and analyzed, staff gauges to be installed, and surface water samples to be collected and analyzed. As the geologic conditions in the area north of 7 Mile Road are somewhat unknown at this time, the actual scope of work for this investigation was expected to be adjusted based on the ongoing findings during the investigation. Adjustments to this anticipated scope of work would be coordinated with EGLE.

The goal of the proposed scope of work was to meet the Part 201 requirements to identify if groundwater impact exceeding applicable Part 201 criteria is present and to define the horizontal and vertical extent of that impact and the factors controlling it. If unacceptable human exposure through the drinking water pathway are identified that are directly attributed to the past irrigation practices, alternate drinking water supplies (bottled water) will be provided until a filter system or suitable alternative can be arranged.

4.1 Irrigation Areas Scope of Work and Findings

Irrigation at the Site has been conducted for the past 24 years (1996 to 2019) using surface water obtained from the gravel pit pond (south pond – see Figure 1S) located south of Cannonsburg Road as the source water. The south pond source of the irrigation water was previously documented to contain PFAS compounds at concentrations above applicable Part 201 criteria. Between January 1 and May 1, 2020, the source of irrigation water was moved from the south pond location (see Figure 1S) to the existing small mine pond located in the active mining area of the Site (see Figure 1S), as described in the following sections. All irrigation at the Site during 2020 is being conducted using water extracted from the new source water location.

Previously, the irrigation water was pumped from the south pond to the irrigation holding ponds located near the southeast corner of the intersection of Brewer Road and 7 Mile Road. The irrigation holding ponds are constructed with an impermeable bottom liner to hold the irrigation water and to prevent it from infiltrating into the sand and gravel soils that are present at that location.

Irrigation water held in the irrigation holding pond is pumped throughout the entire irrigation area of the golf course using below ground piping. Automatic valves, timers, and similar equipment control the movement of the water to all golf course tee areas, fairways, putting greens, driving range, and landscaped areas. Irrigation is not conducted every day. Irrigation is only conducted when needed to augment the natural precipitation at the Site.

The location of the irrigation system components is shown on the irrigation system schematic drawings contained in Appendix 2.

4.2 Irrigation Practices

4.2.1 Past Irrigation Practices

The golf course irrigation areas described in Section 4.1 above are irrigated between approximately May 1 and October 15 of each year. The irrigation system is operated during the evening/night-time hours when golfers are not present. The irrigation system is operated to augment the natural rainfall, to maintain soil moisture, and to provide healthy growing conditions needed to support the turf grass of the golf course and landscaped areas.

The past irrigation operation applied approximately 500,000 gallons of water to the entire golf course area during each cycle of operation. The irrigation system does not operate every night, as it is only operated to augment the natural rainfall. Typically, depending on the weather, the irrigation system operates 2 to 4 nights per week.

After October 15 of each year, the irrigation system is shut down and the below ground piping is "blown out" to prevent possible freezing conditions during the winter.

During August 2019, BCDC implemented irrigation conservation measures to reduce the quantity of irrigation water applied to the golf course. Between August 2019 and October 15, 2019, BCDC greatly reduced the amount of irrigation water applied to the driving range area, which is also the majority location of the former Wolverine Worldwide tannery waste landfill. Additionally, BCDC implemented water conservation measures to reduce the application of irrigation water over the remainder of golf course areas. These water conservation measures, enacted in August 2019, reduced the water application rates to approximately 250,000 gallons per irrigation cycle. These conservation/reduction methods reduced the use of PFAS-impacted irrigation water by approximately one-half of the previous rate.

4.2.2 Current and Future Irrigation Practices

4.2.2.1 Short-Term Changes to Irrigation Practices

As discussed with EGLE during several meetings, BCDC planned to conduct short-term changes to the irrigation practices until permanent, long-term solutions could be implemented. Between August and October 2019, BCDC initiated the water conservation methods described above. Additionally, BCDC planned to modify the irrigation system, which, with the new water conservation methods, was operating at approximately 250,000 gallons per irrigation cycle, by accessing the Plainfield Township water supply main along 7 Mile Road. Plainfield Township had indicated that 100,000 gallons of water could be obtained from that water main each irrigation cycle. It was planned to utilize Plainfield Township Municipal water to add to the irrigation holding pond near the southeast corner of 7 Mile Road and Brewer Road before each irrigation cycle so that the use of PFAS-impacted irrigation water from the south pond could be further reduced to approximately 150,000 gallons per irrigation cycle.

This proposed short-term change to the irrigation practices (assessing the Plainfield Township municipal drinking water system) could not be implemented before the end of the 2019 irrigation season. BCDC was successful in completing all long-term changes to the irrigation system before the start of the 2020 irrigation system began on May 1, 2020, as described below.

4.2.2.2 Long-Term Changes to Irrigation Practices

To fully stop the potential impact to the groundwater in the area of the golf course both north of 7 Mile Road and south of 7 Mile Road from irrigation practices, BCDC eliminated the use of the south pond for the source of irrigation water. BCDC moved the pump intake structure and pump to the current mine pond located in the bottom of the active gravel mining area near the western-most side of the site (Figure 1S).

The proposed long-term replacement of the source of irrigation water is expected to provide a water supply that meets both the current Part 201 drinking water criteria and groundwater-surface water interface (GSI) criteria for PFOS and PFOA.

Water conservation practices to minimize the amount of irrigation water applied to the area of the Wolverine Worldwide tannery waste landfill will continue until a permanent solution for the PFAS-containing waste materials are completed.

To ensure the water quality objectives will be met, samples of the current gravel mine pond water were sampled and analyzed for PFAS. The results of the pond water sampling and analyses are summarized in Table 1. The surface water in the mine pond meets all applicable Part 201 drinking water and GSI criteria for PFAS compounds. The long-term change to the irrigation source water was completed before May 1, 2020.

4.3 Drinking Water Well Sampling and Analysis and Point-of-Use PFAS Filters

4.3.1 Residential Drinking Water Well Evaluation

Due to the potential concern for drinking water exposure, it was recommended that residential drinking water wells be sampled in a progressive sequence. Figure 2 is a parcel identification map for the study area investigated under this Response Activity Plan. Because it is unknown if PFAS-impacted groundwater is migrating offsite from the golf course area located north of 7 Mile Road, and if so, in which specific direction, multiple neighborhoods were sampled at the same time. Samples were collected from existing residential water supply wells in areas north, south, east, and west of the golf course area located north of 7 Mile Road.

To obtain permission to sample the proposed residential wells, request for sampling access letters were sent for each location. Access was requested first using written U.S. mail requests, followed up by door-to-door requests for residents who did not reply to the mailed request.

Residential wells that were granted access for sampling were sampled and analyzed to evaluate the potential presence of PFAS. The samples were analyzed using U.S. Environmental Protection Agency (USEPA) Method 537 REV 1.1 for analysis of drinking water for 24 PFAS compounds. The wells were sampled following the methods described in the Fishbeck Standard Operating Procedure (SOP) for *Residential Sampling Procedure for Per and Polyfluoroalkyl (PFAs)* presented in Appendix 3. The PFAS drinking water sample analyses were initially conducted using an analytical laboratory providing Level 4 Data Quality Control. Subsequent submittals to the analytical laboratory were conducted using Level 2 Data Quality Control. PFAS analytical services were provided by Test America Analytical Laboratories.

Access to sample residential drinking water wells was requested and received for the following parcels, in the following neighborhoods (see Figure 3). Locations that were not granted access, or other conditions, are also noted.

<u>Secluded Lake Area</u>

- Parcels 1, 2, 3, and 4.
- No permission was received to sample parcels 3 and 4.

<u>7 Mile Road Area</u>

- Parcels 5, 6, 7, 40, 41, 42, 43, and 44.
- No permission was received to sample parcel 41 and parcel 44 was found to be undeveloped.

<u>North and West of Wolverine Boulevard</u>

- Parcels 11, 13, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24.
- No permission was received to sample parcels 13, 15, and 17. The church at parcel 11 was found to be serviced by Plainfield Township municipal drinking water.

Bittersweet Neighborhood

No residential drinking water wells were sampled in the Bittersweet neighborhood, as previous EGLE sampling efforts had already been conducted by EGLE and the presence of PFAS compounds in residential drinking water wells had been identified in the Bittersweet neighborhood area. To move directly to protecting water users in the Bittersweet neighborhood, as discussed in Section 4.3.2, below, point-of-use PFAS removal filters were installed for all houses that granted access to install the filters.

Four businesses are located on the north end of the Bittersweet neighborhood at parcels 36, 37, 38, and 39 (see Figure 2). Access to sample those wells was not included in this initial phase of investigation.

Residential Drinking Water Well Analytical Results

Results of each residential drinking water well analysis were forwarded to EGLE and the Michigan Department of Health and Human Services upon receipt. The results for the residential drinking water analyses are summarized in Table 2 and the laboratory analytical data sheets are provided in Appendix 4. None of the residential drinking water wells sampled during this investigation exceeded the previous or current Part 201 drinking water criteria for any PFAS compound.

4.3.2 Point-of-Use PFAS Removal Filters

As specified in the Response Activity Plan for PFAS (August 29, 2019) it was intended to install point-of-use PFAS removal filters for all houses in the Bittersweet neighborhood and for any house found to contain PFAS above an applicable Part 201 drinking water criterion for any PFAS compound. The point-of-use PFAS removal filters consist of Aquasanna 5300+ filter units and cartridges that meet the NSF P473 Standard for PFAS removal. All filters were installed by a licensed plumbing contractor from Dan Jones Plumbing, LLC.

The access to install point-of-use PFAS removal filters was requested and received for the following Bittersweet neighborhood parcels (see Figure 4). Locations that were not granted access, or other conditions, are also noted.

- Access requested for Parcels 45, 46, 47, 48, 49, 51, 52, 53, 55, 56, 57, 58, 59, 60, 61, 62, and 63.
- Filters were installed at the following parcels: 45, 47, 49, 51, 52, 57, 59, 62, and 6125 Brewer Avenue.
- At the start of the Covid-19 pandemic, filters were delivered to houses so that the owners could arrange installation when they were comfortable having plumbing contractors enter their house. Filter were delivered to the following parcels: 53, 56, 58, and 60. Fishbeck has not been billed by Dan Jones Plumbing, LLC for the installation of any of these four filters.
- During the investigation work, it was determined that property owners had independently purchased and installed their own filter system at parcels 55 and 63.
- PFAS point-of-use removal filters have not been provided, because permission was not provided, at the following parcels: 46, 48, and 61.

As summarized in Table 1, and described in Section 4.3.1, above, no residential drinking water samples analyzed during this investigation exceeded any Part 201 drinking water criterion for PFAS and no point-of-use PFAS removal filters needed to be installed based on the results of the water testing.

4.4 Evaluating the Extent of PFAS Contamination Including the Area North of 7 Mile Road

The scope of work specified in the Response Activity Plan for PFAS dated August 29, 2019, originally planned for monitoring well installation, sampling, and laboratory analyses. Based on conversations with EGLE it was agreed that the potential need for monitoring well installation and sampling would be postponed until after the surface water sampling, residential drinking water sampling, point-of-use PFAS removal filter installation was completed,

and the results were reviewed with EGLE. The following is the scope of work that was proposed in the August 29, 2019, work plan.

To investigate the potential presence and extent of PFAS compounds in the groundwater on or originating from the BCDC property north of 7 Mile Road, new monitoring wells will be installed and sampled. The number and location of monitoring wells to be installed will be selected after receiving analytical results for residential wells that are sampled as described in Section 4.3, above. Following the receipt of residential well analytical results, representatives of BCDC will meet with representatives of EGLE to discuss and select monitoring well locations. Because the site geology and hydrogeology north of 7 Mile Road are not defined, the exact location and depth of each monitoring well will be determined as the investigation proceeds. The current CSM indicates a potential source of groundwater impacted with PFAS compounds in the area north of 7 Mile Road may be from surface application of irrigation water. Following the receipt of analytical results for each monitoring well, and the results of any subsequent residential water supply well testing, vertical profile monitoring wells may be required. Additionally, following the installation of onsite monitoring wells, offsite monitoring wells may be necessary. The potential location of offsite monitoring wells will be based on the analytical results of onsite monitoring wells, residential monitoring wells analytical results, and the groundwater flow direction evaluation that will be based on surveyed and measured water elevations in monitoring wells and surface waters. The need for additional monitoring wells and their locations will be discussed with EGLE, and approval from EGLE will be obtained before proceeding. The groundwater investigation will continue until the requirements of Part 201 are fulfilled.

4.4.1 Monitoring Well Installation and Sampling Methods

At each proposed monitoring well location, a two-inch diameter, five-foot long, polyvinyl chloride monitoring well will be installed using standard 4.25-inch hollow stem auger drilling methods and split-spoon sampling. Each monitoring well will be logged by a Fishbeck geologist, following the methods and procedures outlined in the Fishbeck SOP *Soil Samples Description*. The initial monitoring wells will be installed with the top of screen placed approximately 5 feet below the water table surface to provide monitoring locations expected to best represent potential groundwater impacted by PFAS-impacted irrigation water from the adjacent golf course. Each monitoring well will be developed and sampled within seven days after installation, following the methods described in the Fishbeck SOP *Groundwater Sampling Procedure for Per and Polyfluoroalkyl (PFAs)* and related information presented in Appendix 2. During drilling and sampling, equipment blank samples and decontamination water samples will be collected and analyzed to evaluate the potential for trace contributions to the PFAS concentration from the decontamination/wash water process, the well materials, and the sampling equipment. Groundwater and blank samples will be analyzed using USEPA Method 537 Modified using isotope dilution for analysis of drinking water for 24 PFAS compounds. Level 2 data packages will be provided of the analyses of groundwater samples.

4.4.2 Surface Water Elevation and Sampling Locations

A creek is present that flows southward along the east side of Northland Drive that crosses 7 Mile Road onto the gravel mining area of the Site (Figure 1N). A second creek drains Secluded Lake and flows southward across 7 Mile Road into the area north of the tannery waste landfill area (Figure 1S). A pond (Hole 2 Pond) and overflow drainage are located near the northeast corner of 7 Mile Road and Brewer Road that receives surface water drainage from the clay-rich soil areas of the site. The Hole 2 Pond receives storm water runoff and surface water drainage from the golf course and residential neighborhood north of 7 Mile Road that was previously irrigated with PFAS-impacted water. The outfall from the Hole 2 Pond drains to the south under 7 Mile Road and discharges into the pond and creek system that is located immediately south of the tannery waste landfill. The Mine Pond is located in the active gravel mining area and is now used for the irrigation water supply at the site. These creeks and ponds were sampled to evaluate if impacted groundwater is present in the surface water that might indicate a GSI discharge into the creeks. The location of these creeks and the proposed pond water

sampling locations are shown on Figure 5. The analytical results for surface water samples are summarized in Table 2. Laboratory data sheets for each surface water sample are provided in Appendix 4.

The surface water samples from the cemetery pond, Creek 1N, Creek 2N, the Mine Pond, and Secluded Lake did not identify the presence of any PFAS compounds above any applicable Part 201 criteria (see Table 2 and Figure 5.

The water sample from the Hole 2 Pond contained PFOS that exceeded the Part 201 drinking water criteria and the GSI criteria. PFOA was found to be present at a concentration that exceeded the Part 201 drinking water criteria (see Table 2).

As specified in the Response Activity Plan for PFAS dated August 29, 2019, the scope of work originally planned for a staff gauge to be established and surveyed at each surface water sample location, to provide surface water elevation data for use in interpreting the groundwater flow direction(s) at the site. Each surface water sampling location, shown on Figure 4, was sampled following the methods described in the Fishbeck SOP *Groundwater Sampling Procedure for Per and Polyfluoroalkyl (PFAs)* and related information presented in Appendix 3. Surface water samples were analyzed using USEPA Method 537 Modified using isotope dilution for analysis of drinking water for 24 PFAS compounds. Level 2 data packages are provided for the surface water analyses (Appendix 4).

4.5 Hydrogeologic Data Evaluation

Monitoring wells and staff gauges were not installed during this investigation. A groundwater flow model was prepared as part of the application for an ILS Permit for the mine pond in the active gravel, mining area of the site. The results of the surface water sampling and residential well sampling support the existing conceptual groundwater flow model support the conclusion that no human exposure through the drinking water pathway exists at the Site based on data collected during this investigation. Data from previous and separate investigations indicated a possible drinking water pathway exposure related to Type II drinking water wells at a residential mobile home park near the intersection of Wolverine Boulevard and Northland Drive and at a church on Cannonsburg Road. These locations should be evaluated following EGLE PFAS sampling and analysis guidelines for Type II water supply wells.

The results of the surface water and residential well sampling confirm the following:

(1) No PFAS impact above Part 201 applicable limits to drinking water/groundwater or surface water east of the Site in the Secluded Lake neighborhood (two residential water wells remain to be sampled if site access is granted by the property owners).
(2) No PFAS impact above Part 201 applicable limits to drinking water/groundwater south of the Site in the 7 Mile Road neighborhood (one residential water well remains to be sampled if site access is granted by the property owners.
(3) No PFAS impact above Part 201 applicable limits to drinking water/groundwater west of the Site in the area north and west of Wolverine Boulevard neighborhood (three residential water wells remain to be sampled if site access is granted by the property owners.
(4) No PFAS impact above Part 201 applicable limits to surface water in the Mine Pond south of 7 Mile Road;
(5) PFAS point-of-use removal filters have been installed or delivered to all houses in the Bittersweet neighborhood that have requested filters to be provided (four homes in the area have not yet installed the filters that were provided and three homes have not granted permission to have the filters installed).
(6) The Hole 2 Pond contained PFAS compounds above Part 201 applicable limits that is expected to be a results of direct surface water runoff from the irrigation areas that no longer receive PFAS impacted irrigation water.

Collectively, these six findings confirm the existing understanding of groundwater flow under the conceptual site model and demonstrate that no human exposure is occurring above applicable Part 201 criteria.

5.0 Recommendations

The finding of the investigation conducted under the Response Activity Plan for PFAS (August 29, 2019), to date, do not identify any human health exposure above applicable Part 201 criteria. The full scope of work specified in the Response Activity Plan has not been completed due to access not being granted from several property owners to allow residential drinking water wells to be sampled or point-of-use PFAS filters to be installed. Based on the work conducted to date, the following recommendations are provided:

(1) Residential water well sampling should be completed at parcels 3, 4, 13, 15, and 17. Assistance from EGLE or health department representatives in obtaining authorization to sample these wells is requested.
(2) Point-of-use PFAS removal filters that were delivered to parcels 53, 56, 58, and 60 should be installed as soon as homeowners are comfortable having a plumbing contractor enter their homes. If homeowners remain uncomfortable having a plumbing contractor enter their home due to corona virus concerns, the health department should provide bottled water until pandemic concerns are resolved.
(3) Installation of point-of-use PFAS removal filters was not conducted at parcels 46, 48, and 61 because authorization was not provided by the homeowners. Installation of these filters, or residential well sampling, one or the other, not both, should be conducted. Assistance from EGLE or health department representatives in obtaining authorization to sample these wells or install point-of-use PFAS removal filters is requested.
(4) Surface water at the Hole 2 Pond was found to contain PFAS above applicable Part 201 criteria. The Hole 2 Pond should be resampled to determine if the changes in irrigation practices have been successful in reducing the PFAS concentrations at that location.
(5) Parcels 36, 37, 38, and 39 were not included in the initial round of water well testing or point-of-use PFAS removal filter installation. Installation of these filters, or residential well sampling, one or the other, not both, should be conducted.

Figures

SITE PLAN-NORTH

NORTH

0 300 600 FEET

LEGEND

- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary

Creek 1N
SF-6
MW-4
Creek 2N
SF-5
MW-5S
MW-5D
MW-3
MW-2
MW-1S
MW-1D
TWSS-U2

Zverts St NE
Northland Dr NE
Livingood St NE
Bodie St NE
Millis St NE
Checkerberry Ln NE
Thimbleweed Ln NE
Wolverine Blvd NE
M-44
Cemetary Pond
Blythefield Memorial Gardens
Courtland Dr NE
Skyhawk Dr NE
Secluded Lake
Secluded Lake Ct NE
Secluded Lake Dr NE
Kutts Hill
Archer St NE
Senna Dr NE
Bianca Dr NE
Pine Meadows Dr NE
Mesa Ct NE
Mesa Dr NE
M-44 E
Kutts Hill Dr NE
Bittersweet Dr NE
Brower Ave NE
Hole 2 Pond
Boulder Ridge NE
Boulder Mews NE
Boulder Creek Golf Club
7 Mile Rd NE
Tom Morris Dr NE
Mine Pond
Chauncey Dr NE

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Grand Rapids Gravel Company Site
Kent County, Michigan
Progress Report for the Response Activity Plan for PFAS

PROJECT NO.
181258

FIGURE NO.
1N

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdoc\FIG01_SITE PLAN-North.mxd Date: 8/27/2019 8:38:09 AM User: acshwallier

SITE PLAN-SOUTH

NORTH

0 300 600 FEET

LEGEND

- Piezometer
- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdoc\FIG01S_SITE PLAN-South.mxd Date: 8/28/2019 2:39:12 PM User: acschwaller

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Grand Rapids Gravel Company Site
Kent County, Michigan

Progress Report for the Response Activity Plan for PFAS

PROJECT NO.
181258

FIGURE NO.
1S

PARCEL IDENTIFICATION MAP

NORTH

0 300 600 FEET

LEGEND

- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary
- Sampling Area

Zverts St NE
Northland Dr NE
Livingood St NE
Bodie St NE
Millis St NE
Checkerberry Ln NE
Thimbleweed Ln NE
Courtland Dr NE
Skyhawk Dr NE
Wolverine Blvd NE
M-44
Cemetary Pond
Blythefield Memorial Gardens
Secluded Lake
Secluded Lake Dr NE
Senna Dr NE
Blanca Dr NE
Mesa Dr NE
Mesa Ct NE
Pine Meadows Dr NE
Kutts Hill Dr NE
Archer St NE
M-44 E
Brewer Ave NE
Boulder Ridge NE
Boulder Mews NE
Hole 2 Pond
Boulder Creek Golf Club
7 Mile Rd NE
Tom Morris Dr NE
Chauncey Dr NE
Mine Pond
Creek 1N
Creek 2N
SF-6
SF-5
MW-4
MW-5S
MW-5D
MW-3
MW-2
MW-1S
MW-1D
TWSS-U2

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Grand Rapids Gravel Company Site
Kent County, Michigan
Progress Report for the Response Activity Plan for PFAS

PROJECT NO.
181258

FIGURE NO.
2

RESIDENTIAL WELL SAMPLING UPDATE

NORTH

0 300 600 FEET

LEGEND

- Test Pit
- Proposed Surface Water Sample Location
- Monitoring Well
- Approximate Boundary of Tannery Waste Disposal Area
- Parcel Boundary
- Sampling Area
- 24 Well Sampled
- 44 Vacant
- 11 Municipal Service

Zverts St NE
Northland Dr NE
Checkerberry Ln NE
Trimbley Dr NE
Courtland Dr NE
Livingood St NE
Bodie St NE
Mills St NE
Skyhawk Dr NE
Northedge St NE
Pond
Kurtshill Dr NE
Wolverine Blvd NE
M-44
Cemetary Pond
Senna Dr NE
Blanca Dr NE
Mesa Dr NE
Pine Meadows Dr NE
Mesa Ct NE
Archer St NE
Kurts Hill Dr NE
M-44 E
Blythefield Memorial Gardens
Secluded Lake
Secluded Lake Ct NE
Secluded Lake Dr NE
Courtland Dr NE
Brewer Ave NE
Boulder Rdg NE
Boulder Mdws NE
Hole 2 Pond
Boulder Creek Golf Club
Bittersweet Dr NE
7 Mile Rd NE
Creek 1N
Creek 2N
SF-6
SF-5
MW-4
MW-5S
MW-5D
MW-3
MW-2
MW-1S
MW-1D
TWSS-02
Tom Morris Dr NE
Chauncey Dr NE
Mine Pond

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PLOT INFO: Z:\2018\181258\CAD\GIS\mapdocs\Sept2020 Progress Report\FIG03_Residential Well Sampling Update.mxd Date: 9/9/2020 2:41:27 PM User: acschwallier

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Grand Rapids Gravel Company Site
Kent County, Michigan

Progress Report for the Response Activity Plan for PFAS

PROJECT NO.
181258

FIGURE NO.
3

PFAS FILTER UPDATE

NORTH

0 300 600 FEET

LEGEND

- Test Pit
- Proposed Surface Water Sample Location
- Monitoring Well
- Approximate Boundary of Tannery Waste Disposal Area
- Parcel Boundary
- Sampling Area
- Clean by Previous Sample
- 63 Filter Installation Completed
- 62 Filter Installation In Progress
- 48 No Response

Zverts St NE
Northland Dr NE
Checkerberry Ln NE
Thimbleweed Ln NE
Courtland Dr NE
Livingood St NE
Bodie St NE
Millis St NE
Wolverine Blvd NE
M-44
Skyhawk Dr NE
Kutts Hill Dr NE
Senna Dr NE
Blanca Dr NE
Pine Meadows Dr NE
Mesa Ct NE
Mesa Dr NE
Arbrer St NE
M-44 E
Cemetary Pond
Blythefield Memorial Gardens
Secluded Lake
Secluded Lake Dr NE
Secluded Lake Ct NE
Bittersweet Dr NE
Brewer Ave NE
Boulder Ridge NE
Boulder Mews NE
Hole 2 Pond
Boulder Creek Golf Club
7 Mile Rd NE
Creek 1N
Creek 2N
SF-6
SF-5
MW-4
MW-5S
MW-5D
MW-3
MW-2
MW-1S
MW-1D
TWSS-U2
Tom Morris Dr NE
Chauncey Dr NE
Mine Pond

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Grand Rapids Gravel Company Site
Kent County, Michigan
Progress Report for the Response Activity Plan for PFAS

PROJECT NO.
181258

FIGURE NO.
4

PROPOSED MONITORING WELL/ SURFACE WATER SAMPLING LOCATIONS

NORTH

0 300 600 FEET

LEGEND

- Proposed Piezometer/Surface Water Sampling Location
- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary
- Sampling Area

Zverts St NE
Northland Dr NE
Checkerberry Ln NE
Livingood St NE
Bodie St NE
Millis St NE
Wolverine Blvd NE
M-44
Cemetary Pond
Skyhawk Dr NE
Courtland Dr NE
Senna Dr NE
Blanca Dr NE
Pine Meadows Dr NE
Mesa Ct NE
Mesa Dr NE
Archer St NE
Kutts Hill Dr NE
M-44 E
Blythefield Memorial Gardens
Secluded Lake
Secluded Lake Ct NE
Secluded Lake Dr NE
Bittersweet Dr NE
Brewer Ave NE
Boulder Mows NE
Boulder Ridg NE
Hole 2 Pond
Boulder Creek Golf Club
7 Mile Rd NE
Creek 1N
Creek 2N
SF-6
SF-5
MW-4
MW-5S
MW-5D
MW-3
MW-2
MW-1S
MW-1D
Mine Pond
Tom Morris Dr NE
Chauncey Dr NE
TWSS-U2

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdocs\Sept2020 Progress Report\FIG05_Monitoring Well-Surface Water Sampling Locations.mxd Date: 9/25/2020 8:02:17 AM User: acschwaller

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Grand Rapids Gravel Company Site
Kent County, Michigan
Progress Report for the Response Activity Plan for PFAS

PROJECT NO.
181258

FIGURE NO.
5

Tables

Table 1 - Surface Water Data Summary - Poly- and Perfluoroalkyl Substances (PFAS)
Grand Rapids Gravel Company Site, Kent County, Michigan
January 2020

Monitoring Location: *Laboratory ID:* *Collection Date:*		*Residential DWC [1]*	*Nonresidential DWC [1]*	*GSI Criteria [1]*	*MI DW MCL [2]*	SW-CEMETERY POND 240-124607-6 01/03/20	SW-CREEK 1 N 240-124607-4 01/03/20	SW-CREEK 2 N 240-124607-2 01/03/20	SW-HOLE 2 POND 240-124607-3 01/03/20	SW-MINE POND 240-124607-5 01/03/20	SW-SECLUDED LAKE 240-124607-1 01/03/20
Compound	*CAS Number*										
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	--	--	--	0.17 U	0.17 U	0.17 U	0.16 U	0.17 U	0.18 U
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	--	--	--	--	4.9 U	5.0 U	4.8 U	4.7 U	5.0 U	5.1 U
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	--	--	--	--	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U	2.0 U
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	--	--	--	--	1.9 U	1.9 U	1.9 U	1.8 U	1.9 U	2.0 U
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	--	--	--	--	0.23 U	0.23 U	0.22 U	0.22 U	0.23 U	0.24 U
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	--	--	--	--	0.30 U	0.31 U	0.30 U	0.29 U	0.31 U	0.31 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)(GenX)	13252-13-6	--	--	--	*370*	1.4 U	1.5 U	1.4 U	1.4 U	1.4 U	1.5 U
N-Ethyl perfluorooctane sulfonamido acetic acid (N-EtFOSAA)	2991-50-6	--	--	--	--	1.8 U	1.8 U	1.8 U	1.7 U	1.8 U	1.9 U
N-Methyl perfluorooctane sulfonamido acetic acid (N-MeFOSAA)	2355-31-9	--	--	--	--	2.9 U	3.0 U	2.9 U	2.8 U	3.0 U	3.0 U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	--	--	--	*420*	5.9	5.9	4.8	9.6	5.6	1.9 J
Perfluorobutanoic acid (PFBA)	375-22-4	--	--	--	--	1.5 J	2.4	2.5	4.1	2.9	3.4
Perfluorodecane sulfonic acid (PFDS)	335-77-3	--	--	--	--	0.30 U	0.31 U	0.30 U	0.29 U	0.31 U	0.31 U
Perfluorodecanoic acid (PFDA)	335-76-2	--	--	--	--	0.29 U	0.30 U	0.29 U	0.28 U	0.30 U	0.30 U
Perfluorododecanoic acid (PFDoDA)	307-55-1	--	--	--	--	0.52 U	0.53 U	0.51 U	0.50 U	0.53 U	0.54 U
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	--	--	--	--	0.28 J	0.23 J	0.18 U	1.0 J	0.24 J	0.19 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	--	--	--	0.68 J	0.81 J	0.60 J	2.4	1.1 J	0.70 J
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	--	--	--	*51*	3.4	3.3	2.6	9.0	3.0	0.78 JB
Perfluorohexanoic acid (PFHxA)	307-24-4	--	--	--	*4.00E+05*	1.3 J	2.1	0.81 J	3.7	2.2	1.3 J
Perfluorononane sulfonic acid (PFNS)	68259-12-1	--	--	--	--	0.15 U	0.16 U	0.15 U	0.15 U	0.15 U	0.16 U
Perfluorononanoic acid (PFNA)	375-95-1	--	--	--	*6.0*	0.26 U	0.26 U	0.27 J	0.47 J	0.27 J	0.50 J
Perfluorooctane sulfonamide (PFOSA)	754-91-6	--	--	--	--	0.33 U	0.34 U	0.33 U	0.32 U	0.34 U	0.34 U
Perfluorooctane sulfonic acid (PFOS) (DD)	1763-23-1	*70 (JJ)*	*70 (JJ)*	*12 (X)*	*16*	6.2	6.9	5.7	26	6.7	5.2
Perfluorooctanoic acid (PFOA) (DD)	335-67-1	*70 (JJ)*	*70 (JJ)*	*12,000 (X)*	*8.0*	3.5	4.3	2.9	10	4.9	2.4
Perfluoropentanoic acid (PFPeA)	2706-90-3	--	--	--	--	1.0 J	1.5 J	0.76 J	2.8	1.6 J	1.2 J
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	--	--	--	--	2.3	1.7 J	2.0	5.8	1.6 J	0.29 U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	--	--	--	0.28 U	0.28 U	0.27 U	0.26 U	0.31 JB	0.28 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	--	--	--	1.2 U	1.3 U	1.2 U	1.2 U	1.2 U	1.3 U
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	--	--	--	--	1.0 U	1.1 U	1.0 U	1.0 U	1.1 U	1.1 U
PFOS+PFOA	--	*70 (JJ)*	*70 (JJ)*	--	--	9.7	11	8.6	36	12	7.6
Total PFAS	--	--	--	--	--	26	29	23	75	30	17

Results expressed in ng/L.
Bolded values exceed an applicable criterion.

Data Qualifiers:

B Not detected substantially above the level reported in laboratory or field blanks.
J Estimated value
U Not detected

Footnotes/Abbreviations:

[1] Part 201 Groundwater Generic Cleanup Criteria/Part 213 Tier 1 Risk-based Screening Levels, January 10, 2018 (GSI Criteria Updated June 25, 2018).

[2] Proposed Drinking Water Standards, EGLE/MPART, October 11, 2019.

[3] Proposed VI Tier 1 Groundwater, Soil and Vapor Screening Levels, Part 201 Generic Screening Levels/Part 213 Risk-based Screening Levels, August 29, 2017.

(X) Criterion is not protective for surface water used as a drinking water source.

(JJ) The residential and nonresidential drinking water criteria for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) are not calculated using the equations of R 299.10 or the toxicological, chemical- specific, or chemical-physical input values as shown in the tables of R 299.50. The PFOA drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA), EPA 822-R-16-005, May 2016. The PFOS drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS), EPA 822-R-16-004, May 2016. Compliance with the drinking water criteria shall require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of 0.07 µg/L. The drinking

DWC drinking water criterion
GSI groundwater surface water interface
ID Insufficient data to develop criterion.
MCL maximin contamination limit
NA not available
NLV Not likely to volatilize under most conditions.
SL screening level
VI vapor intrusion
VIAIC volatilization to indoor air inhalation criteria

Table 2 - Drinking Water Data Summary - Poly- and Perfluoroalkyl Substances (PFAS)
Grand Rapids Gravel Company Site, Kent County, Michigan
January 2020

Monitoring Location: *Parcel ID:* *Field Duplicate:* *Laboratory ID:* *Collection Date:*		*Residential DWC [1]*	*Nonresidential DWC [1]*	*GSI Criteria [1]*	*Water Solubility [1]*	*MI Proposed DW MCL [2]*	4211 7 Mile RD 7 240-122370-5 11/11/19	4230 7 Mile RD NE 40 240-122806-2 11/21/19	4230 7 Mile RD NE 40 Duplicate 240-122806-3 11/21/19	4253 7 Mile RD 6 240-122370-4 11/11/19	4303 Secluded Lk DR NE 1 240-122370-1 11/11/19	4360 7 Mile RD NE 43 240-122806-4 11/21/19
Compound	*CAS Number*											
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)(GenX)	13252-13-6	--	--	--	--	*370*	2 U	2 U	2 U	2 U	2 U	2 U
N-Ethyl perfluorooctane sulfonamido acetic acid (N-EtFOSAA)	2991-50-6	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
N-Methyl perfluorooctane sulfonamido acetic acid (N-MeFOSAA)	2355-31-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	--	--	--	--	*420*	2 U	5.4	5.4	7.4	2 U	2.1
Perfluorodecanoic acid (PFDA)	335-76-2	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorododecanoic acid (PFDoDA)	307-55-1	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	--	--	--	--	*51*	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	--	--	--	*4.00E+05*	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorononanoic acid (PFNA)	375-95-1	--	--	--	--	*6.0*	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorooctane sulfonic acid (PFOS) (DD)	1763-23-1	*70 (JJ)*	*70 (JJ)*	*12 (X)*	*3,100*	*16*	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorooctanoic acid (PFOA) (DD)	335-67-1	*70 (JJ)*	*70 (JJ)*	*12,000 (X)*	*9.50E+09*	*8.0*	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U	2 U
PFOS+PFOA	--	*70 (JJ)*	*70 (JJ)*	--	--	--	4 U	4 U	4 U	4 U	4 U	4 U
Total PFAS	--	--	--	--	--	--	ND	5.4	5.4	7.4	ND	2.1

Results expressed in ng/L.
Bolded values exceed an applicable criterion.

Data Qualifiers:
U Not detected

Footnotes/Abbreviations:
[1] Part 201 Groundwater Generic Cleanup Criteria/Part 213 Tier 1 Risk-based Screening Levels, January 10, 2018 (GSI Criteria Updated June 25, 2018).
[2] Proposed Drinking Water Standards, EGLE/MPART, October 11, 2019.
[3] Proposed VI Tier 1 Groundwater, Soil and Vapor Screening Levels, Part 201 Generic Screening Levels/Part 213 Risk-based Screening Levels, August 29, 2017.
(X) Criterion is not protective for surface water used as a drinking water source.
(JJ) The residential and nonresidential drinking water criteria for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) are not calculated using the equations of R 299.10 or the toxicological, chemical- specific, or chemical-physical input values as shown in the tables of R 299.50. The PFOA drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA), EPA 822-R-16-005, May 2016. The PFOS drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS), EPA 822-R-16-004, May 2016. Compliance with the drinking water criteria shall require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of 0.07 µg/L. The drinking water
DWC drinking water criterion
GSI groundwater surface water interface
ID Insufficient data to develop criterion.
MCL maximin contamination limit
NA not available
ND not detected
NLV Not likely to volatilize under most conditions.
SL screening level
VI vapor intrusion
VIAIC volatilization to indoor air inhalation criteria

Table 2 - Drinking Water Data Summary - Poly- and Perfluoroalkyl Substances (PFAS)
Grand Rapids Gravel Company Site, Kent County, Michigan
January 2020

Monitoring Location: *Parcel ID:* *Field Duplicate:* *Laboratory ID:* *Collection Date:*		*Residential DWC [1]*	*Nonresidential DWC [1]*	*GSI Criteria [1]*	*Water Solubility [1]*	*MI Proposed DW MCL [2]*	4361 7 Mile RD 5 240-122370-2 11/11/19	4361 7 Mile RD 5 Duplicate 240-122370-3 11/11/19	4444 Secluded Lk DR NE 2 240-122370-14 11/13/19	6237 Northland DR NE 12 240-122370-6 11/11/19	6410 Northland DR NE 14 240-122370-7 11/11/19
Compound	*CAS Number*										
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)(GenX)	13252-13-6	--	--	--	--	*370*	2 U	2 U	2 U	2 U	2 U
N-Ethyl perfluorooctane sulfonamido acetic acid (N-EtFOSAA)	2991-50-6	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
N-Methyl perfluorooctane sulfonamido acetic acid (N-MeFOSAA)	2355-31-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	--	--	--	--	*420*	16	16	2 U	3.6	5.7
Perfluorodecanoic acid (PFDA)	335-76-2	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluorododecanoic acid (PFDoDA)	307-55-1	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	--	--	--	--	*51*	13	12	2 U	2 U	2.9
Perfluorohexanoic acid (PFHxA)	307-24-4	--	--	--	--	*4.00E+05*	2 U	2 U	2 U	2 U	2.3
Perfluorononanoic acid (PFNA)	375-95-1	--	--	--	--	*6.0*	2 U	2 U	2 U	2 U	2 U
Perfluorooctane sulfonic acid (PFOS) (DD)	1763-23-1	*70 (JJ)*	*70 (JJ)*	*12 (X)*	*3,100*	*16*	8.6	8.3	2 U	3.2	10
Perfluorooctanoic acid (PFOA) (DD)	335-67-1	*70 (JJ)*	*70 (JJ)*	*12,000 (X)*	*9.50E+09*	*8.0*	3.3	3.2	2 U	2 U	6.4
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
PFOS+PFOA	--	*70 (JJ)*	*70 (JJ)*	--	--	--	12	12	4 U	3.2	16
Total PFAS	--	--	--	--	--	--	41	40	ND	6.8	27

Results expressed in ng/L.
Bolded values exceed an applicable criterion.

Data Qualifiers:
U Not detected

Footnotes/Abbreviations:
[1] Part 201 Groundwater Generic Cleanup Criteria/Part 213 Tier 1 Risk-based Screening Levels, January 10, 2018 (GSI Criteria Updated June 25, 2018).
[2] Proposed Drinking Water Standards, EGLE/MPART, October 11, 2019.
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(X) Criterion is not protective for surface water used as a drinking water source.
(JJ) The residential and nonresidential drinking water criteria for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) are not calculated using the equations of R 299.10 or the toxicological, chemical- specific, or chemical-physical input values as shown in the tables of R 299.50. The PFOA drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA), EPA 822-R-16-005, May 2016. The PFOS drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS), EPA 822-R-16-004, May 2016. Compliance with the drinking water criteria shall require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of 0.07 µg/L. The drinking water
DWC drinking water criterion
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ID Insufficient data to develop criterion.
MCL maximin contamination limit
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SL screening level
VI vapor intrusion
VIAIC volatilization to indoor air inhalation criteria

Table 2 - Drinking Water Data Summary - Poly- and Perfluoroalkyl Substances (PFAS)
Grand Rapids Gravel Company Site, Kent County, Michigan
January 2020

Monitoring Location: *Parcel ID:* *Field Duplicate:* *Laboratory ID:* *Collection Date:*		*Residential DWC [1]*	*Nonresidential DWC [1]*	*GSI Criteria [1]*	*Water Solubility [1]*	*MI Proposed DW MCL [2]*	6486 Thimbleweed LN NE 18 240-122370-13 11/13/19	6494 Thimbleweed LN NE 19 240-122370-8 11/11/19	6504 Thimbleweed LN NE 20 240-122806-1 11/21/19	6510 Thimbleweed LN NE 21 240-124607-1 01/03/20
Compound	*CAS Number*									
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	--	--	--	--	2 U	2 U	2 U	2 U
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	--	--	--	--	--	2 U	2 U	2 U	2 U
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	--	--	--	--	--	2 U	2 U	2 U	2 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)(GenX)	13252-13-6	--	--	--	--	*370*	2 U	2 U	2 U	2 U
N-Ethyl perfluorooctane sulfonamido acetic acid (N-EtFOSAA)	2991-50-6	--	--	--	--	--	2 U	2 U	2 U	2 U
N-Methyl perfluorooctane sulfonamido acetic acid (N-MeFOSAA)	2355-31-9	--	--	--	--	--	2 U	2 U	2 U	2 U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	--	--	--	--	*420*	2 U	2 U	2 U	4.2
Perfluorodecanoic acid (PFDA)	335-76-2	--	--	--	--	--	2 U	2 U	2 U	2 U
Perfluorododecanoic acid (PFDoDA)	307-55-1	--	--	--	--	--	2 U	2 U	2 U	2 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	--	--	--	--	2 U	2 U	2 U	2 U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	--	--	--	--	*51*	2 U	2 U	2.2	2.1
Perfluorohexanoic acid (PFHxA)	307-24-4	--	--	--	--	*4.00E+05*	2 U	2 U	2 U	2 U
Perfluorononanoic acid (PFNA)	375-95-1	--	--	--	--	*6.0*	2 U	2 U	2 U	2 U
Perfluorooctane sulfonic acid (PFOS) (DD)	1763-23-1	*70 (JJ)*	*70 (JJ)*	*12 (X)*	*3,100*	*16*	2 U	2 U	2 U	2 U
Perfluorooctanoic acid (PFOA) (DD)	335-67-1	*70 (JJ)*	*70 (JJ)*	*12,000 (X)*	*9.50E+09*	*8.0*	2 U	2 U	2 U	2 U
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	--	--	--	--	2 U	2 U	2 U	2 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U
PFOS+PFOA	--	*70 (JJ)*	*70 (JJ)*	--	--	--	4 U	4 U	4 U	4 U
Total PFAS	--	--	--	--	--	--	ND	ND	2.2	6.3

Results expressed in ng/L.
Bolded values exceed an applicable criterion.

Data Qualifiers:
U Not detected

Footnotes/Abbreviations:
[1] Part 201 Groundwater Generic Cleanup Criteria/Part 213 Tier 1 Risk-based Screening Levels, January 10, 2018 (GSI Criteria Updated June 25, 2018).
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(X) Criterion is not protective for surface water used as a drinking water source.
(JJ) The residential and nonresidential drinking water criteria for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) are not calculated using the equations of R 299.10 or the toxicological, chemical- specific, or chemical-physical input values as shown in the tables of R 299.50. The PFOA drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA), EPA 822-R-16-005, May 2016. The PFOS drinking water criteria are the health advisory value as presented in the USEPA Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS), EPA 822-R-16-004, May 2016. Compliance with the drinking water criteria shall require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of 0.07 µg/L. The drinking water
DWC drinking water criterion
GSI groundwater surface water interface
ID Insufficient data to develop criterion.
MCL maximin contamination limit
NA not available
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NLV Not likely to volatilize under most conditions.
SL screening level
VI vapor intrusion
VIAIC volatilization to indoor air inhalation criteria

Table 2 - Drinking Water Data Summary - Poly- and Perfluoroalkyl Substances (PFAS)
Grand Rapids Gravel Company Site, Kent County, Michigan
January 2020

Monitoring Location: *Parcel ID:* *Field Duplicate:* *Laboratory ID:* *Collection Date:*		*Residential DWC [1]*	*Nonresidential DWC [1]*	*GSI Criteria [1]*	*Water Solubility [1]*	*MI Proposed DW MCL [2]*	6516 Thimbleweed LN NE 22 240-122370-9 11/11/19	6522 Thimbleweed LN NE 23 240-122370-10 11/11/19	6532 Thimbleweed LN NE 24 240-122370-11 11/12/19	QCFB-01 240-122370-12 11/12/19	QCFB-02 240-122806-5 11/21/19
Compound	*CAS Number*										
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	763051-92-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Hexafluoropropylene oxide dimer acid (HFPO-DA)(GenX)	13252-13-6	--	--	--	--	*370*	2 U	2 U	2 U	2 U	2 U
N-Ethyl perfluorooctane sulfonamido acetic acid (N-EtFOSAA)	2991-50-6	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
N-Methyl perfluorooctane sulfonamido acetic acid (N-MeFOSAA)	2355-31-9	--	--	--	--	--	2 U	2 U	2 U	2.0 U	2 U
Perfluorobutane sulfonic acid (PFBS)	375-73-5	--	--	--	--	*420*	2.9	2 U	2.8	2.0 U	2 U
Perfluorodecanoic acid (PFDA)	335-76-2	--	--	--	--	--	2 U	2 U	2 U	2.0 U	2 U
Perfluorododecanoic acid (PFDoDA)	307-55-1	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluoroheptanoic acid (PFHpA)	375-85-9	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	--	--	--	--	*51*	2.6	2.7	2.0	2 U	2 U
Perfluorohexanoic acid (PFHxA)	307-24-4	--	--	--	--	*4.00E+05*	2 U	2 U	2 U	2 U	2 U
Perfluorononanoic acid (PFNA)	375-95-1	--	--	--	--	*6.0*	2 U	2 U	2 U	2 U	2 U
Perfluorooctane sulfonic acid (PFOS) (DD)	1763-23-1	*70 (JJ)*	*70 (JJ)*	*12 (X)*	*3,100*	*16*	2 U	2 U	2 U	2 U	2 U
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Perfluorotetradecanoic acid (PFTeDA)	376-06-7	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	--	--	--	--	--	2 U	2 U	2 U	2 U	2 U
PFOS+PFOA	--	*70 (JJ)*	*70 (JJ)*	--	--	--	4 U	4 U	4 U	4 U	4 U
Total PFAS	--	--	--	--	--	--	5.5	2.7	4.8	ND	ND

Results expressed in ng/L.
Bolded values exceed an applicable criterion.

Data Qualifiers:
U Not detected

Footnotes/Abbreviations:
[1] Part 201 Groundwater Generic Cleanup Criteria/Part 213 Tier 1 Risk-based Screening Levels, January 10, 2018 (GSI Criteria Updated June 25, 2018).
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NLV Not likely to volatilize under most conditions.
SL screening level
VI vapor intrusion
VIAIC volatilization to indoor air inhalation criteria

Appendix 1

Addendum Report to the Hydrogeologic Investigation Report Grand Rapids Gravel Company Gravel and Sand Mining Operation 7 Mile Road and Brewer Roads Plainfield Township, Michigan (May 2003)

Northeast Gravel Company

Project No. 181258
June 26, 2020

fishbeck
Engineers | Architects | Scientists | Constructors

Addendum Report
to the
Hydrogeologic Investigation Report
Grand Rapids Gravel Company Gravel and Sand Mining Operation
7 Mile Road and Brewer Roads
Plainfield Township, Michigan
(May 1, 2003)

Prepared for:
Northeast Gravel Company

June 29, 2020
Project No. 181258

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List of Abbreviations/Acronyms

AMSL	above mean sea level
EGLE	Michigan Department of Environment, Great Lakes, and Energy
GMS	Groundwater Modeling System
gpm	gallons per minute
GRCC	Generic Residential Cleanup Criteria
ILS	inland lakes and streams
MSL	mean sea level
MW	monitoring well
PFAS	Per- and Polyfluoroalkyl Substance

1.0 Introduction

Grand Rapids Gravel Company is applying for an Inland Lakes and Streams Permit to expand the size of the existing gravel mine lake to greater than 5 acres at the Plainfield Township site. The site location is shown on Figure 1. Multiple documents have previously been submitted using MiWaters to support the inland lakes and streams (ILS) permit application by representatives of King and MacGregor, Inc. Fishbeck has worked on various aspects of hydrogeological investigation at the site dating back to approximately 1990 and has considerable additional information to support the ILS permit application not previously submitted. Previously, a "sister company" of Grand Rapids Gravel Company, Northeast Gravel Company, conducted gravel mining and landfill operations at the portion of the site located east of Brewer Road.

Previous work at the site conducted by Fishbeck has primarily included:

(1) the preparation of a *Hydrogeologic Investigation Report, Grand Rapids Gravel Company Gravel and Sand Mining Operation, 7 Mile Road and Brewer Roads, Plainfield Township, Michigan (May 1, 2003);*

(2) the preparation of a *Remedial Investigation Report for Northeast Gravel Company, Act 307 Site, Plainfield Township Michigan, October 1994;*

(3) the preparation of a *Remedial Action Certification Report, Northeast Gravel Company, Plainfield Township, Michigan (August 1997);* and

(4) the ongoing investigation of Per- and Polyfluoroalkyl Substance (PFAS) groundwater impact related to the disposal of Wolverine Worldwide tannery waste at the former landfill site east of Brewer Road.

In addition to these past investigations and documents, Fishbeck has prepared a new groundwater flow model simulation that is presented in this addendum. The groundwater flow model is intended to provide a clear understanding of the potential effects of the proposed lake expansion. The finding of the groundwater flow model discussed below support the conclusion that the lake expansion project should be approved as requested.

On approximately April 10, 2020, Dan Greene (Fishbeck) and Mario Fusco (Michigan Department of Environment, Great Lakes, and Energy [EGLE]) talked by telephone to discuss the email from Morgan Vinyard (April 9, 2020), the long hydrogeologic investigation history at the site, multiple documents that have been prepared/submitted for the site, and additional information that Fishbeck can provide to support the ILS permit application. During the telephone call Dan and Mario discussed aspects of the project and the existing data. It was decided that Fishbeck would prepare this addendum report to the 2003 Hydrogeologic Investigation Report to address three primary questions including:

(1) the size-shape-depth-extent of the proposed lake expansion,

(2) the resulting changes to the water budget that would occur as a result of the proposed lake expansion, and

(3) the existing and proposed groundwater equilibrium conditions that would develop for the proposed lake expansion.

Additionally, it was discussed that the 2003 Hydrogeologic Investigation Report had previously been provided to EGLE in support of the ILS permit application using MiWaters and that extensive hydrogeologic information applicable to this permit application was contained in that report. Mario indicated that he would review that report and notify Fishbeck if significant concerns were identified

during his review. Dan indicated that he would proceed with the preparation of this addendum report, as timely completion of the permit application is very important for this project. At the time of the writing of this addendum report, no comments or concerns have been received from EGLE related to the previous hydrogeological report content.

2.0 Background

Extensive investigations were conducted at the site on the parcel that is located immediately east of Brewer Road, related to the operation and closure of a permitted solid waste disposal facility. Figure 2 is a site map showing current site features and the former landfill consisting of three disposal cells that were located on the east side of Brewer Road, approximately 1,950 feet east of the proposed lake expansion of the Mine Pond located southeast of the intersection of Northland Drive, NE and 7 Mile Road, NE. All three landfill cells were closed as documented in the *Remedial Action Certification Report Northeast Gravel Company Plainfield Township, Michigan* (August 1997), by placing engineered landfill cover systems. Two landfill cells, the domestic waste cell and the plating waste cell, were closed using a compacted clay cover system to prevent the infiltration of precipitation. One landfill cell, the tannery waste cell, was closed using a permeable vegetated cover system. The former Wolverine Worldwide tannery waste landfill cell was subsequently found to be a source of groundwater impact with PFAS and Grand Rapids Gravel is working with EGLE Remediation and Redevelopment Division to address this concern. Additionally, Northeast Gravel has filed a lawsuit against Wolverine Worldwide to hold them accountable for their PFAS responsibilities related to the former landfill.

Investigations of PFAS in the groundwater related to the former tannery waste landfill site that is located east of Brewer Avenue were conducted by Fishbeck during 2019 and 2020. Northeast Gravel operated one permitted landfill cell in the former mining pit that received tannery waste materials from Wolverine Worldwide. The former landfill cells were closed following all regulatory requirements applicable at the time and the work is documented in reports (2) and (3) referenced in Section 1.0.

Fishbeck has sampled the landfill contents, surface water, and groundwater that have been impacted by the former operation of the tannery waste landfill. Impacted groundwater and surface water south of the former tannery waste landfill were previously used to supply irrigation water for the Boulder Creek Golf Course resulting in the potential impact to groundwater in the golf course areas both north and south of 7 Mile Road. To address this potential concern, Fishbeck has sampled potentially impacted residential water wells and surface waters located along and north of 7 Mile Road. The purpose of the sampling was to determine if the use of PFAS impacted irrigation water has impacted drinking water resources along and north of 7 Mile Road. The findings of this ongoing work have been communicated to EGLE (Karen Vorce and John Pawloski) during multiple meetings. While no residential drinking water wells have been identified exceeding the current Part 201 Generic Residential Cleanup Critiera (GRCC) Drinking Water Criteria of 70 parts per trillion residents of the "Bittersweet Neighborhood" which is located west of Brewer Avenue, NE and north of 7 Mile Road have been provided with point-of-use PFAS removal drinking water filters to protect the residents until the current lawsuit filed by Northeast Gravel against Wolverine Worldwide is resolved.

Groundwater and surface water at the former landfill site have been impacted from the historic disposal of tannery waste containing PFAS from Wolverine Worldwide. A map showing the location of PFAS analytical results for groundwater and surface water is provided in Appendix 1. The source of irrigation

water for the golf course was the surface water pond south of Cannonsburg Road, NE represented by sample SW-Pond-1s. During 2020, the source of the irrigation was moved to the existing mine pond in the active gravel mine area located east of Northland Drive, NE and south of 7 Mile Road, NE. The use and expansion of the existing and proposed mine pond are important for the elimination of the source of PFAS impact to irrigation water for the Boulder Creek Golf Course and the protection of drinking water resource and residential drinking water wells north of the site.

3.0 Proposed Lake Expansion

As documented in previous MiWater submittals, a small pond (identified on Figure 2 as "Mine Pond") is approximately 3.39 acres in size with a surface water elevation of approximately 626 feet above mean sea level (AMSL). Grand Rapids Gravel is requesting permission to expand the size of the pond to 12.6 acres and to construct the pond with an outlet level control structure that will lower the surface water elevation of the pond by approximately 11 feet to an elevation of approximately 615 feet AMSL. The orientation of the proposed pond expansion is specifically selected to have its long axis oriented west-to-east, so the expanded pond (i.e., lake) will be perpendicular to the groundwater flow direction. The proposed lake with a lower surface water elevation will be below the 1-percent flood elevation of the Grand River (623.1 feet AMSL) and will provide flood storage capacity during high water events on the Grand River. It should be noted that by lowering the adjacent groundwater elevation, additional groundwater storage capacity will be realized during flood events on the Grand River. This "bank storage" effect will also provide time-delayed drainage of groundwater to further reduce the severity of flood events on the Grand River.

4.0 Summary of Concerns

Four primary concerns are identified related to the requested pond expansion. The concerns are related to:

(1) potential impact to wetlands,

(2) increased evaporation from the larger surface water pond,

(3) existing groundwater impact with PFAS east of the site, and

(4) potential impact to residential drinking water wells. A groundwater flow model, discussed in Section 5.0 of this report, is used to evaluate each of these concerns. Sections 4.1 through 4.4 describe the potential project concerns in more detail.

4.1 Wetlands

Wetlands are present in the flood plain of the Grand River along the south side of the site as shown on Figure 2. One possible concern related to the proposed lake expansion would be if the proposed lake expansion might adversely affect the wetlands along the Grand River.

The wetlands identified in Figure 2 represent the area where groundwater discharges to the flood plain of the Grand River resulting in hydric soils that are continually moist and support wetland vegetation. It should be noted that the system of ponds and surface water located east of Brewer Road discharges to the flood plain of the Grand River at the southwest corner of the South Pond at the location marked SF-4 south of Cannonsburg Road, NE (Figure 2). The location of the stream channel of the outfall has not

been mapped due to dense vegetation between the pond and the Grand River; however, based on field inspection, the outfall creek flows to the west and closely follows location of the wetland-upland transitions. The presence of the unmapped creek path that closely follows the wetland-upland transition is important because the outfall creek functions as a "constant head boundary." The creek discharges water to the wetland and effectively prevents a lowering of the shallow water table aquifer near the creek outfall and, therefore, protects the wetlands near the creek from the potential effect of lowered groundwater levels which may occur as a result of the proposed lake expansion. As a result, the groundwater model evaluation would be expected to overestimate changes to the groundwater elevation at the wetland-upland transition along the Grand River because the groundwater model was constructed with the Grand River channel to the south as the constant head boundary.

4.2 Evaporation and Water Budget

Expanding the size of the Mine Pond from its present size of 3.39 acres to a lake with a proposed size of 12.6 acres would increase the surface water area by approximately 9.21 acres. The increase of the surface water area would, therefore, result in increased evaporation. While the effect would be very small, the results are discussed in the following sections. The increase in evaporation will not significantly affect the groundwater resource related to the proposed lake expansion.

4.3 PFAS Groundwater and Surface Water Impact

Groundwater and surface water are impacted by PFAS at locations that are downgradient (south) of the tannery waste landfill. As noted above, ongoing investigations are being conducted and the results have been presented in several meetings with EGLE (Karen Vorce and John Pawloski). The results of recent groundwater and surface water PFAS samples are presented in Appendix 1.

As noted in the remedial investigation and closure reports for the tannery waste landfill, the geology below and downgradient (south) of the tannery waste landfill is characterized with a sand and gravel water table aquifer. The PFAS impact follows the groundwater flow direction and some groundwater discharges into adjacent surface waters. The PFAS impact follows the groundwater flow direct as PFAS compounds act as "conservative tracers" of groundwater flow. As noted above, the surface water of the southernmost pond located south of Cannonsburg Road, NE was the source of irrigation water used to water the grass and landscaping of the Boulder Creek Golf Course. As shown in Appendix 1, the surface water of the southern-most pond has been impacted with PFAS. The use of the southernmost pond as the source of irrigation water has been stopped and the source of irrigation water for the golf course irrigation has been moved to the existing 3.39-acre Mine Pond. The water of the Mine Pond has been tested and been shown to contain PFAS compound concentrations that are below all applicable Part 201 GRCC.

The concern exists that expanding the existing Mine Pond from 3.39 acres to a lake with the proposed size of 12.6 acres and lowering the surface water elevation by 11 feet could influence the flow of groundwater and expand the PFAS plume potentially causing PFAS to discharge into the proposed lake expansion. The possibility was evaluated using the groundwater flow model discussed below. The results show that no significant change would occur to the extent of groundwater or surface water impacted with PFAS.

4.4 Residential Water Wells

Fishbeck has worked closely with EGLE to identify residential water wells located in the vicinity of the site. Appendix 2 contains a map showing all residential parcels that EGLE identified as requiring testing to determine if PFAS-impacted groundwater might be present. It should be noted that parcels north of 7 Mile Road, south of Wolverine Boulevard, and west of Brewer Avenue (the Bittersweet Neighborhood) were previously identified by EGLE as likely contain PFAS compounds, so additional groundwater testing was not conducted at those locations. Instead, parcels in the Bittersweet Neighborhood were offered point-of-use PFAS removal filters until the lawsuit filed by Northeast Gravel against Wolverine Worldwide can be resolved at which time a permanent solution would likely be determined by the court decision.

Even through no residents are required to drink PFAS-impacted groundwater from the Bittersweet Neighborhood, the concern was identified that expansion of the Mine Pond and the potential lowering of the surface water elevation in the Bittersweet Neighborhood could possibly cause wells to function poorly or go dry. The groundwater flow model confirms this as a potential concern and is discussed below.

5.0 Site Hydrogeology and Groundwater Flow Model

To evaluate the four concerns identified in Section 4.0, a groundwater flow model was constructed to simulate the site geology and groundwater flow conditions. The groundwater flow modeling was conducted using the Aquaveo™ Groundwater Modeling System (GMS). GMS provides an interface for the MODFLOW groundwater flow model to the solution of variable groundwater flow conditions. While the modeling solution used, MODFLOW, is a fully numeric groundwater flow model, the flow modeling for this evaluation should be considered more like an analytical groundwater flow model, as full calibration and sensitivity analysis procedures were not utilized. The GMS groundwater flow model for the site is, therefore, considered an accurate evaluation of a relatively "simple" groundwater flow system and does not provide fully quantified numeric solutions at all location within the model domain. Overall, the GMS model is considered to be "conservative" and is intended to overestimate potential adverse impacts.

5.1 Existing Conditions

The geology and hydrogeology of the site is well documented based on the previous site investigations over the past 30 years. The aquifer at the site is a water table aquifer made up of sand and gravel deposits. The groundwater flow direction at the site, based on actual water level and surface water elevation data (see Table 1) is to the south-southwest and discharges to the Grand River and adjacent wetland. The aquifer thickness is generally 65 feet thick and the permeability of the aquifer is generally 124 feet per day. The current site conditions and groundwater contour map are shown on the Figure 3 baseline modeled groundwater contour map.

The water table surface is represented by the blue contour lines. The extent of the PFAS groundwater impact area is represented by "particle traces" shown in red. The particle traces represent the path that groundwater molecules would follow that originated at the outside perimeter of the tannery waste landfill. The western most and eastern most particle traces, therefore, represent the maximum extent of the existing PFAS groundwater impact. This groundwater flow model evaluation closely simulates the

extent of the PFAS groundwater impact based on groundwater and surface water sample shown in Appendix 1, and largely confirms the conceptual site model for groundwater flow at the site.

The existing lake (i.e., Mine Pond) occupies an area of approximately 3.39 acres and the existing surface water elevation is approximately 626 feet AMSL. Figure 3 shows the existing pond location. The existing conditions were used as the model set up and calibration was achieved using the average annual Grand River surface water elevation, recent groundwater elevations for monitoring well data, and surface water elevation control structures for the system of ponds located south of the tannery waste landfill area. The resulting groundwater flow direction and gradient also matches the site conditions identified in Report (1) identified in Section 1.0.

5.2 Proposed Lake Expansion

The proposed pond expansion will increase the size of the lake to approximately 12.6 acres; and engineering control will be used to lower the lake elevation from the present-day surface water elevation of 626 feet AMSL, down to the final proposed surface water elevation of 615 feet AMSL. The proposed lake will drain through an engineered outfall structure to maintain a constant lake elevation of approximately 615 feet AMSL. The outfall of the lake will discharge to the Grand River through at a 36-inch storm water sewer. The Exxel Engineering design drawings for the proposed lake were previously submitted using the MiWaters System and include the present and proposed ground elevations, the proposed location of the storm outfall from the lake, and two cross sections of the lake orientated at right angles to illustrate the side slopes, depth, storm drain structures, volume of excavated material (168,000 cubic yards), the elevation of the 100-year flood plain (623.1 feet AMSL), and the volume of flood plain credits that would be created by the proposed lake expansion (246,000 cubic yards or 152.4 acre-feet).

The Exxel Engineering design drawings also contain a geologic cross section that is oriented north-south through the proposed lake area to illustrate the surface geologic conditions in the area of the proposed lake.

The lake will be excavated into economic gravel deposits which will be processed for use as building material. Fishbeck has conducted recent hydraulic conductivity tests of the gravel rich deposits in the area of the proposed lake and has determined that the gravel rich deposits have an average groundwater permeability of 124 feet per day. It should be noted that the permeability noted in the 2003 Hydrogeological Investigation Report ranged between 67 feet per day and 207 feet per day. For the purpose of evaluating the hydraulic effects of the proposed lake expansion, the aquifer permeability value of 124 feet per day is used.

Grand Rapids Gravel Company has designed the orientation of the proposed lake to be long in the west-east direction (perpendicular to groundwater flow) and short in the north-south direction (parallel to groundwater flow). Additionally, the north-south length of the proposed lake has not been increased more than the existing north-south length of the lake to minimize the effects on the water table gradient.

5.3 Groundwater Flow Model Evaluation

To evaluate the proposed lake expansion, the alterations to groundwater flow conditions, and the impact on the four concerns identified above, the GMS model for the site was run to simulate to the

proposed expanded lake conditions. The footprint of the lake was expanded to 12.6 acres, the lake was simulated as a constant head zone with the water elevation set to be 615 feet MSL, and the model was run as a "steady-state" solution to the groundwater flow conditions.

Figure 4 shows the expanded pond modeled groundwater contour map. The results are shown as the water table contour map that would result under steady-state equilibrium conditions after the lake is expanded. The water table surface elevation is shown in blue contours and the western- and eastern-most extent of PFAS groundwater impact is shown by the red particle traces. The western-most PFAS particle traces show a slight westward shift of the area of PFAS groundwater impact along the southern boundary of the modeled area compared to the baseline modeled groundwater contour map (Figure 3). The slight westward shift does not result in any increase in human or ecological exposure because no drinking water wells are located in the area and the outfall of the southernmost pond south of Cannonsburg Road, NE (i.e., "South Pond") flows to the west following the upland transition to wetland. The discharge of the South Pond (see Appendix 1) contains PFAS-impacted surface water; therefore, no increase in ecological impact results from the slight westward shift in the PFAS groundwater impact as a result of the proposed lake expansion.

Figure 5 shows the results of the groundwater flow model for the proposed lake expansion expressed as change in groundwater elevations. Figure 5 was prepared by taking the difference between the baseline model groundwater contour map (Figure 3) and the expanded pond modeled groundwater contour map (Figure 4). Figure 5, therefore, shows the groundwater "drawdown" that would be expected to result from the proposed lake expansion.

Figure 5 shows that up to 13 feet of water level drawdown could occur in the Bittersweet Neighborhood north of 7 Mile Road and west of Brewer Avenue. Review of the available Wellogic water well records from the Geowebface Database (https://www.deq.state.mi.us/GeoWebFace/) shows that more than 27 residential water wells are present in the Bittersweet Neighborhood and more than 18 of those wells report a standing height of water in the well as being less than 30 feet.

The results of the groundwater flow model evaluation of the proposed lake expansion and the review of residential well logs in the Bittersweet Neighborhood identify that the proposed lake expansion could interfere with the operation of many of the existing water wells in the Bittersweet Neighborhood. The potential impact to existing water wells in the Bittersweet Neighborhood is actually considered a benefit to the residents of the Bittersweet Neighborhood due to the presence of PFAS in the groundwater and is discussed in Section 6.4, below.

6.0 Site Concerns and Groundwater Flow Model Results

6.1 Wetlands

Wetlands are present south of the proposed lake expansion area. As noted in Section 4.1, above, the GMS groundwater flow model of the site does not consider the presence of the south pond outfall channel that flows westward to and discharges into the Grand River. The south pond outfall channel functions as a hydraulically connected "constant head boundary" for the water table aquifer at the site. The groundwater flow model simulation of the proposed lake expansion calculates that approximately 1 foot of water level drawdown (Figure 5) could result from the proposed lake expansion; however, the

presence of the surface water outfall from the southernmost pond prevents this depression of the water table from occurring at the wetland locations.

In the professional experience of Fishbeck, the results of the groundwater flow model that are interpreted to show no adverse impact to wetlands and the proposed lake expansion is recommended.

6.2 Water Budget

Increasing the size of the existing lake from 3.39 acres to approximately 12.6 acres will increase the amount of surface water evaporation. Based on local climate conditions, the annual increase of evaporation from the increased lake area is calculated to be 36.36 gallons per minute (gpm). The GMS groundwater model was used to calculate the groundwater flux that would discharge out of the proposed expanded lake level control structure. The proposed lake discharge was calculated to be 1,489 gpm and the increased evaporation rate is considered to be negligible by comparison. No sensitive habitats are located downgradient of the proposed lake expansion that would be adversely affected by the increase rate of surface water evaporation.

In the professional experience of Fishbeck, the results of the groundwater flow model and the calculation of increased evaporation from the proposed lake expansion show that no adverse impact to the water budget are expected from the increased evaporation rate of the expanded lake area and the proposed lake expansion is recommended.

6.3 PFAS Groundwater and Surface Water Impact

Surface water and groundwater are impacted with PFAS in areas south of the Wolverine Worldwide tannery waste landfill that is located east of Brewer Avenue. The extent of surface water and groundwater impact is shown in Appendix 1. While the groundwater model evaluation of the proposed lake expansion shows that minor changes to the groundwater flow direction could occur, no increase in human or ecological exposure risk will result. No drinking water wells are located in the area of the slightly-altered groundwater flow direction. No increase in ecological exposure to PFAS will occur as the surface water creek outfall from the southernmost pond south of Cannonsburg Road, NE already contains PFAS.

In the professional experience of Fishbeck, the results of the groundwater flow model and the known distribution of PFAS in surface water and groundwater show that no increase of exposure risk to PFAS compounds is expected and the proposed lake expansion is recommended.

6.4 Residential Water Wells

The results of the groundwater flow model evaluation of the proposed lake expansion, and the review of residential well logs in the Bittersweet Neighborhood, shows that up to 13 feet of water level drawdown could occur in the Bittersweet Neighborhood (Figure 5) north of 7 Mile Road and west of Brewer Avenue. More than 27 residential water wells are present in the Bittersweet Neighborhood and more than 18 of those wells report a standing height of water in the well as being less than 30 feet. Based on these findings, it is expected that residential wells could be adversely affected by the proposed lake expansion. It should be noted, however, that the shallow residential water wells in the Bittersweet Neighborhood have been provided with PFAS removal filters by Northeast Gravel. Northeast Gravel has filed a lawsuit against Wolverine Worldwide to hold them accountable for the PFAS impact to surface

and groundwater. This lawsuit is expected to take several years to resolve and alternate water supply wells or connections to municipal water service will likely not be provided until the lawsuit is resolved.

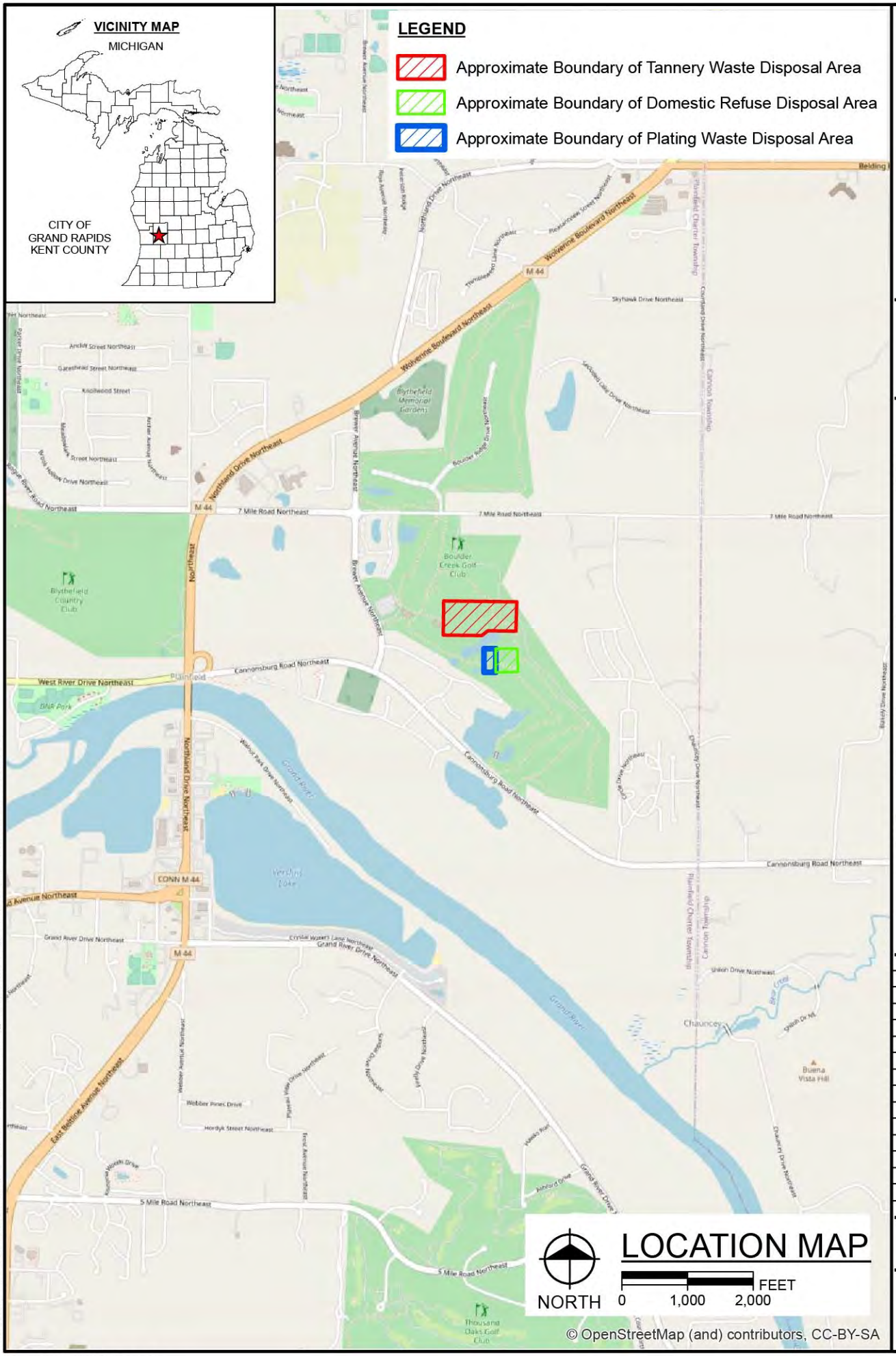
Grand Rapids Gravel, as part of their special use permit for sand and gravel mining from Plainfield Township is required to repair or replace any water supply wells impacted by the gravel mining operation. While it is expected that the groundwater flow model for the proposed lake expansion overestimates the amount of water level lowering that will occur in the Bittersweet Neighborhood, if any water well is impacted by the proposed lake expansion, Grand Rapids Gravel will either (1) lower the pumps in the wells, (2) install replacement bedrock wells that are isolated from the existing PFAS impact, or (3) provide connections to the Plainfield Township water system. In this way, "drying up" residential water wells in the Bittersweet Neighborhood could actually expedite the solution to PFAS-impacted groundwater originating from the Wolverine Worldwide tannery waste landfill cell.

To determine if the proposed lake expansion will actually impact residential water wells in the Bittersweet Neighborhood, Fishbeck will install water level monitoring and logging pressure transducers in monitoring wells MW-4S and MW-4D that are located immediately south of the Bittersweet Neighborhood to track water levels during the proposed lake expansion. Arrangements have been made with Rosendall Well Drilling to be on "standby" if it is determined that any residential water wells may need service or replacement.

While it is possible that the proposed lake expansion could adversely affect water well operation, in the Bittersweet Neighborhood, the sand and gravel mining special use permit requires that all impacted water wells be repaired or replaced, or an alternate water supply be provided. With these water supply protections in place, it would be expected that the potential to impact water well operation would actually be a solution to the existing water quality concerns that already exist and will not be resolved until the lawsuit filed by Northeast Gravel against Wolverine Worldwide is resolved.

Fishbeck has reviewed the results of the groundwater flow model, the evaluation of well construction in the Bittersweet Neighborhood, and the requirements of the Grand Rapids Gravel special use permit for sand and gravel mining that any potential impact to water well operation will be corrected. If any interference to the operation of residential water wells in the Bittersweet Neighborhood should occur, Grand Rapids Gravel would be required to restore or replace the water service to each house. Based on these findings and facts, it is the professional opinion of Fishbeck that the proposed lake expansion be approved.

Figures



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Grand Rapids Gravel Company Site

Kent County, Michigan

Inland Streams and Lakes Investigation

PROJECT NO.
181258

FIGURE NO.
1

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdoc\inland lakes and streams\FIG01_LOCATION MAP.mxd Date: 6/22/2020 3:50:13 PM User: acschwaller

SITE PLAN

0 300 600 FEET

NORTH

Creek 1N
SF-6
MW-4
Creek 2N
SF-5
MW-5S
MW-5D
Mine Pond
3.3 Acres
MW-3
MW-2
MW-1S
MW-1D
TWSS-02
TWSS-01
TWSS-03
TW-MW-2
TW-MW-1
Pond 3N
PWSS-02
PWSS-01
PWSS-03
SF-1
SF-2
Creek 3M
SF-3
Pond 2M
3735 Preserve Dr NE
5607 Sheba Dr NE
4022 Preserve Dr NE
PZ-4
SF-4
South Pond
PZ-3
NE Gravel-MW5
Pond 1S
NE Gravel-MW4
NE Gravel-MW6
4435 Cannonsburg Rd NE
4300 Cannonsburg Rd NE
4525 Cannonsburg Dr NE
4507 Cannonsburg Rd NE
PZ-2
PZ-1
4540 Cannonsburg Rd NE
Grand River
7 Mile Rd NE
Hole 2 Pond
Boulder Creek Golf Club
Boulder Mdws NE
Tom Morris Dr NE
Brewer Ave NE
Northland Dr NE
M-44
Cannonsburg Rd NE
Chauncey Dr NE
Munising Dr NE
N Goldfinch Dr NE
N Seagull Dr NE
Manistee Dr NE
Goldfinch Dr NE
Seagull Dr NE
Circle Dr NE
Meadowmoor Dr NE
Robin Ct
Chippewa Dr NE
Courtland Twp

LEGEND

- Piezometer
- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Wetlands
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdoc\inland lakes and streams\FIG02_Site Plan.mxd Date: 6/22/2020 3:42:33 PM User: acschwaller

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Grand Rapids Gravel Company Site
Kent County, Michigan

Inland Streams and Lakes Investigation

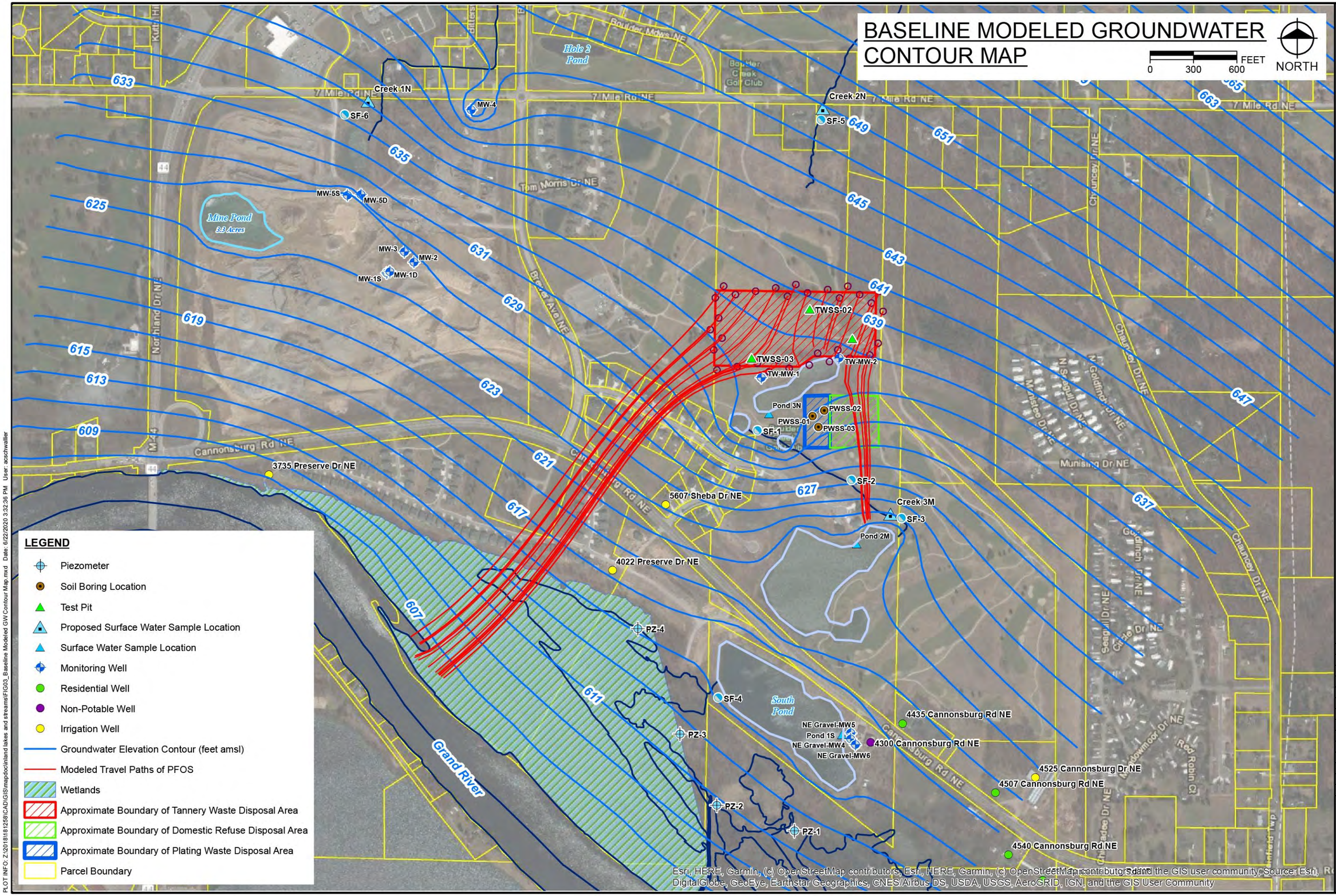
PROJECT NO.
181258

FIGURE NO.
2

BASELINE MODELED GROUNDWATER CONTOUR MAP

0 300 600 FEET

NORTH



LEGEND

- Piezometer
- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Groundwater Elevation Contour (feet amsl)
- Modeled Travel Paths of PFOS
- Wetlands
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdoc\inland lakes and streams\FIG03_Baseline Modeled GW Contour Map.mxd Date: 6/22/2020 3:32:36 PM User: acschwaller

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Grand Rapids Gravel Company Site
Kent County, Michigan

Inland Streams and Lakes Investigation

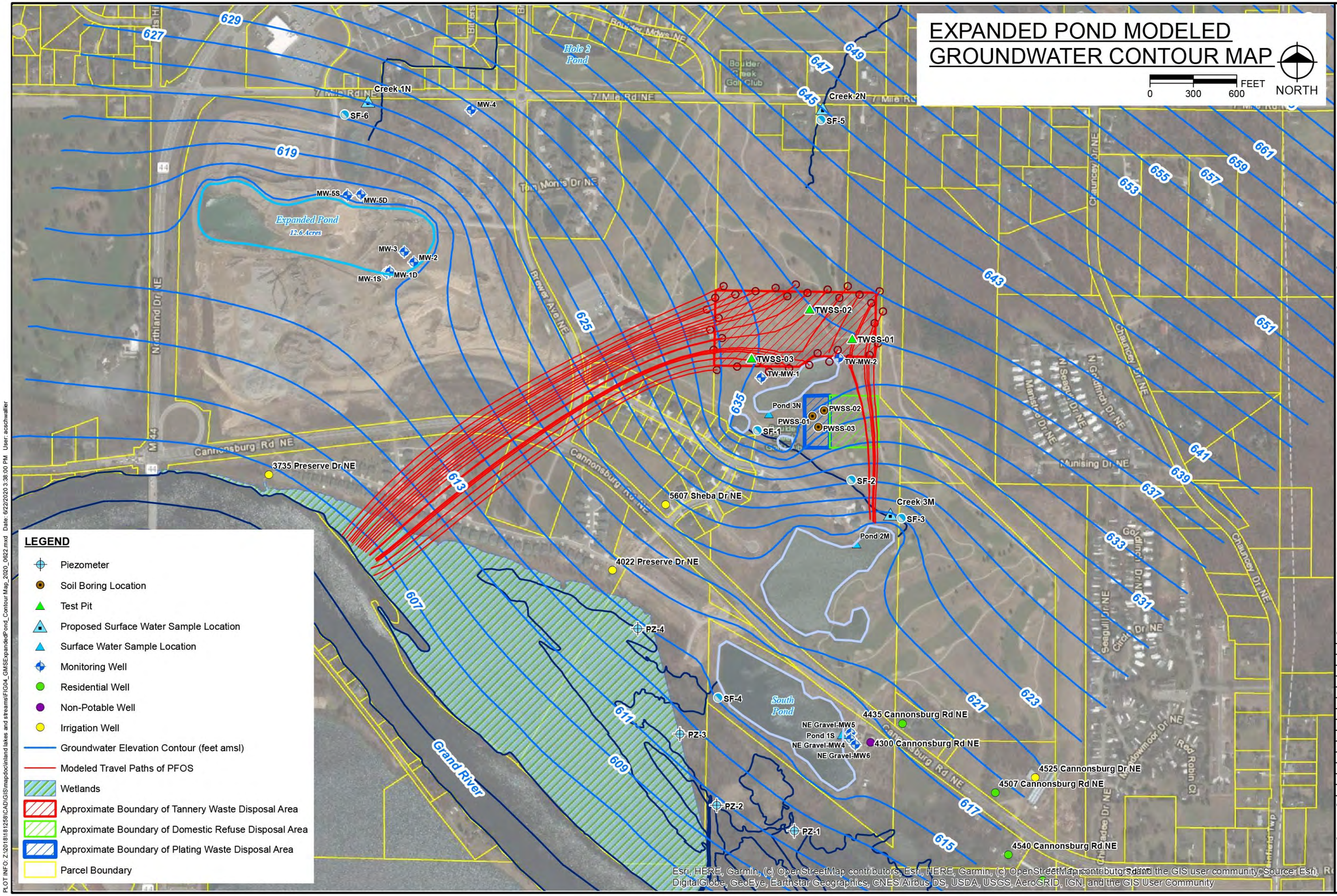
PROJECT NO.
181258

FIGURE NO.
3

EXPANDED POND MODELED GROUNDWATER CONTOUR MAP

0 300 600 FEET

NORTH



LEGEND

- Piezometer
- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Groundwater Elevation Contour (feet amsl)
- Modeled Travel Paths of PFOS
- Wetlands
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdoc\inland lakes and streams\FIG04_GMSExpandedPond_ContourMap_2020_0622.mxd Date: 6/22/2020 3:38:00 PM User: acschwaller

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Grand Rapids Gravel Company Site
Kent County, Michigan
Inland Streams and Lakes Investigation

PROJECT NO.
181258

FIGURE NO.
4

CHANGE IN GROUNDWATER ELEVATION

0 300 600 FEET

NORTH

LEGEND

- Piezometer
- Soil Boring Location
- Test Pit
- Proposed Surface Water Sample Location
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Change in Head
- Wetlands
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- Parcel Boundary

-10 -11 -12 -13 -14 -15 -17 -7 -9 -8 -6 -5 -4 -3 -2 -1

Creek 1N
SF-6
MW-4
MW-5S
MW-5D
MW-3
MW-2
MW-1S
MW-1D
Expanded Pond
12.6 Acres
Hole 2 Pond
Creek 2N
SF-5
TWSS-02
TWSS-01
TWSS-03
TW-MW-2
TW-MW-1
Pond 3N
PWSS-02
PWSS-01
PWSS-03
SF-1
SF-2
Creek 3M
SF-3
Pond 2M
3735 Preserve Dr NE
5607 Sheba Dr NE
4022 Preserve Dr NE
PZ-4
SF-4
South Pond
PZ-3
PZ-2
PZ-1
NE Gravel-MW5
Pond 1S
NE Gravel-MW4
NE Gravel-MW6
4435 Cannonsburg Rd NE
4300 Cannonsburg Rd NE
4525 Cannonsburg Dr NE
4507 Cannonsburg Rd NE
4540 Cannonsburg Rd NE
Grand River
7 Mile Rd NE
Cannonsburg Rd NE
Tom Morris Dr NE
Boulder Creek Golf Club
Boulder Ridge Golf Club
Northland Dr NE
Brewer Ave NE
Chauncey Dr NE
Munising Dr NE
N Goldfinch Dr NE
N Seagull Dr NE
Circle Dr NE
Meadowmoor Dr NE
Red Robin Ct
Chickadee Dr NE
Canfield Twp
M-44
44

PLOT INFO: Z:\2018\181258\CAD\GIS\mapdoc\inland lakes and streams\FIG05_ExpandedPond_ChangeHead_2020_0622.mxd Date: 6/22/2020 3:41:16 PM User: acschwaller

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Grand Rapids Gravel Company Site
Kent County, Michigan

Inland Streams and Lakes Investigation

PROJECT NO.
181258

FIGURE NO.
5

Tables

Table 1 - Summary of Groundwater and Surface Water Elevations
Grand Rapids Gravel Company Site, Kent County, Michigan
June 2020

Location	Type	Elevation (ft)
Grand River	Surface	605.6
Southern Pond	Surface	615.3
South Central Pond	Surface	620.5
North Central Pond	Surface	635.5
Northwestern Pond	Surface	635.0
Northern Pond	Surface	636.0
Expanded Mine Pond	Surface	615.0
MW-1	Groundwater	626.44
MW-2	Groundwater	626.27
MW-3	Groundwater	626.33
MW-4	Groundwater	649.25
MW-5	Groundwater	626.58

Appendix 1

PFAS Results
for Groundwater and
Surface Water

SAMPLE RESULTS & ISOCONCENTRATION CONTOUR MAP JANUARY 2019

NORTH

0 300 600 FEET

	Residential DWC	GSI Criteria
PFOS (DD)	70 (JJ)	12 (X)
PFOA (DD)	70 (JJ)	12,000 (X)

Port 201 Groundwoter Generic Cleanup Criteria/Port 213 Tier 1 Risk-based Screening Levels, January 10, 2018 (GSI Criteria Updoted June 25, 2018).

(X) - Criterion is not protective for surface water used as a drinking water source.

(JJ) - Compliance with the drinking water criteria shall require comparing the sum of the PFOA and PFOS groundwater concentrations to the drinking water criterion of 70 ng/L.

*Results by AECOM - July 23, 2018

LEGEND

- Stream Flow Location
- Piezometer
- Test Pit
- Surface Water Sample Location
- Monitoring Well
- Residential Well
- Non-Potable Well
- Irrigation Well
- Approximate Boundary of Tannery Waste Disposal Area
- Approximate Boundary of Domestic Refuse Disposal Area
- Approximate Boundary of Plating Waste Disposal Area
- PFOS Isoconcentration Contour (ppt) - January 2019

PFOS - Perfluorooctane sulfonic acid
PFOA - Perfluorooctanoic acid
J - Estimated value.
U - Not detected above the given limit.
Results expressed in ng/L.
Bolded values exceed an applicable criterion.

SW Creek 1N 01/14/19: PFOS 4.86, PFOA 2.00 U
SW Creek 2N 01/14/19: PFOS 2.00 U, PFOA 2.00 U
MW-5S 08/28/18: PFOS 10.92, PFOA 10.00 U
MW-5D 08/28/18: PFOS 2.00 U, PFOA 10.00 U
*3735 Preserve 07/23/18: PFOS 26.00, PFOA 10.00
*5607 Preserve 07/23/18: PFOS 3475, PFOA 2491
*4022 Preserve 07/23/18: PFOS 1176, PFOA 915
TW-MW-1 01/17/19: PFOS 867.89, PFOA 176.22
TW-MW-2 01/17/19: PFOS 639.72, PFOA 344.48
SW Pond 3N 01/15/19: PFOS 2,802.92, PFOA 437.03
SW Creek 3N 01/15/19: PFOS 2,605.95, PFOA 363.15
SW Creek 3M 01/15/19: PFOS 774.59, PFOA 274.55
SW Pond 2M 01/15/19: PFOS 1,428.27 J, PFOA 241.33
PZ-4 01/15/19: PFOS 389.99, PFOA 380.46
PZ-3 01/17/19: PFOS 76.23, PFOA 50.74
PZ-2 01/17/19: PFOS 12.47, PFOA 12.90
PZ-1 01/17/19: PFOS 2.00 U, PFOA 2.00 U
SW Pond 1S 01/14/19: PFOS 988.73, PFOA 161.74
MW-04 01/21/19: PFOS 62.79, PFOA 39.68
MW-05 01/21/19: PFOS 35.36, PFOA 70.05
MW-06 01/21/19: PFOS 34.58, PFOA 26.36
DW-4435 Cannonsburg 01/17/19: PFOS 2.00 U, PFOA 19.43
*4525 Cannonsburg 07/23/18: PFOS 0.00, PFOA 0.00
DW-4507 Cannonsburg 01/17/19: PFOS 15.69, PFOA 39.99
DW-4540 Cannonsburg 01/17/19: PFOS 2.00 U, PFOA 2.00 U

7 Mile Rd NE; Creek 1N; SF-6; Creek 2N; SF-5; Boulder Mews NE; Boulder Creek Golf Club; Tom Morris Dr NE; Brewer Ave NE; Northland Dr NE; M-44; Cannonsburg Rd NE; 3735 Preserve Dr NE; 5607 Sheba Dr NE; 4022 Preserve Dr NE; Grand River; Pond 3N; Pond 2M; Pond 1S; SF-2; SF-3; SF-4; SF-1; NE Gravel-MW5; NE Gravel-MW4; NE Gravel-MW6; 4435 Cannonsburg Rd NE; 4300 Cannonsburg Rd NE; 4525 Cannonsburg Dr NE; 4507 Cannonsburg Rd NE; 4540 Cannonsburg Rd NE; Munising Dr NE; Chauncey Dr NE; N Goldfinch Dr NE; Manistee Dr NE; N Seagull Dr NE; Goldfinch Dr NE; Seagull Dr NE; Circle Dr NE; Ridgewood Dr NE; Red Robin Ct; Cherokee Dr NE; Grandfield Twp; 500; 2000; 70

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fricch
engineers
scientists
architects
constructors

fishbeck, thompson, carr & huber, inc.

Hard copy is intended to be 11"x17" when plotted. Scale(s) indicated and graphic quality may not be accurate for any other size.

Northeast Gravel Company Site
Kent County, Michigan

PROJECT NO. 181258

FIGURE NO. 2

Appendix 2

Residential Land Parcel with
Drinking Water Wells

PFAS FILTER UPDATE

NORTH

0 300 600 FEET

LEGEND

- Test Pit
- Proposed Surface Water Sample Location
- Monitoring Well
- Approximate Boundary of Tannery Waste Disposal Area
- Parcel Boundary
- Sampling Area
- Clean by Previous Sample
- 63 Filter Installation Completed
- 62 Filter Installation In Progress
- 48 No Response

Ziverts St NE
Northland Dr NE
Livingood St NE
Bodie St NE
Millis St NE
Checkerberry Ln NE
Thimbleweed Ln NE
Courtland Dr NE
Skyhawk Dr NE
Wolverine Blvd NE
M-44
Cemetary Pond
Kutshill Dr NE
Senna Dr NE
Bianca Dr NE
Mesa Dr NE
Pine Meadows Dr NE
Mesa Ct NE
Archer St NE
Kutts Hill Dr NE
M-44 E
Blythefield Memorial Gardens
Secluded Lake
Secluded Lake Ct NE
Secluded Lake Dr NE
Brewer Ave NE
Lintsweet Dr NE
Boulder Rdg NE
Boulder Mdws NE
Hole 2 Pond
Boulder Creek Golf Club
7 Mile Rd NE
Creek 1N
Creek 2N
SF-6
SF-5
Tom Morris Dr NE
Chauncey Dr NE
MW-5S
MW-5D
Mine Pond
TWSS-02

fishbeck
Engineers | Architects | Scientists | Constructors

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Grand Rapids Gravel Company Site
Kent County, Michigan

PROJECT NO.
181258

FIGURE NO.
1

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Appendix 2

MATCHLINE A

MATCHLINE A

POND

ROAD CROSSING

TUNNEL

PUMP STATION

IRRIGATION POND

PUTTING COURSE

PARKING

CLUBHOUSE

CONSUMERS POWER CO. - R.O.W.

MAINTENANCE AREA

MATCHLINE B

MATCHLINE B

CENTRAL AREA

BOULDER CREEK GOLF COURSE

PRELIMINARY ASBUILT / AUGUST 4, 1997

PRELIMINARY ASBUILT / MARCH 23, 1998

IRRIGATION KEY

- RAIN BIRD EAGLE 900 V-I-H ROTOR W/#30 NOZZLE
- RAIN BIRD EAGLE 700 V-I-H ROTOR W/#18 NOZZLE
- RAIN BIRD EAGLE 700 V-I-H ROTOR W/#14 NOZZLE
- RAIN BIRD FALCON POP UP ROTOR
- RAIN BIRD EFB-CP-PRS CONTROL VALVE
- RAIN BIRD #5 QUICK COUPLING VALVE
- PVC CL 200 LATERAL LINE 2"
- PVC CL 200 LATERAL LINE 2 1/2"
- PVC CL 200 LATERAL LINE 3"
- PVC CL 200 MAINLINE 3" TO 10"

NORTH AREA

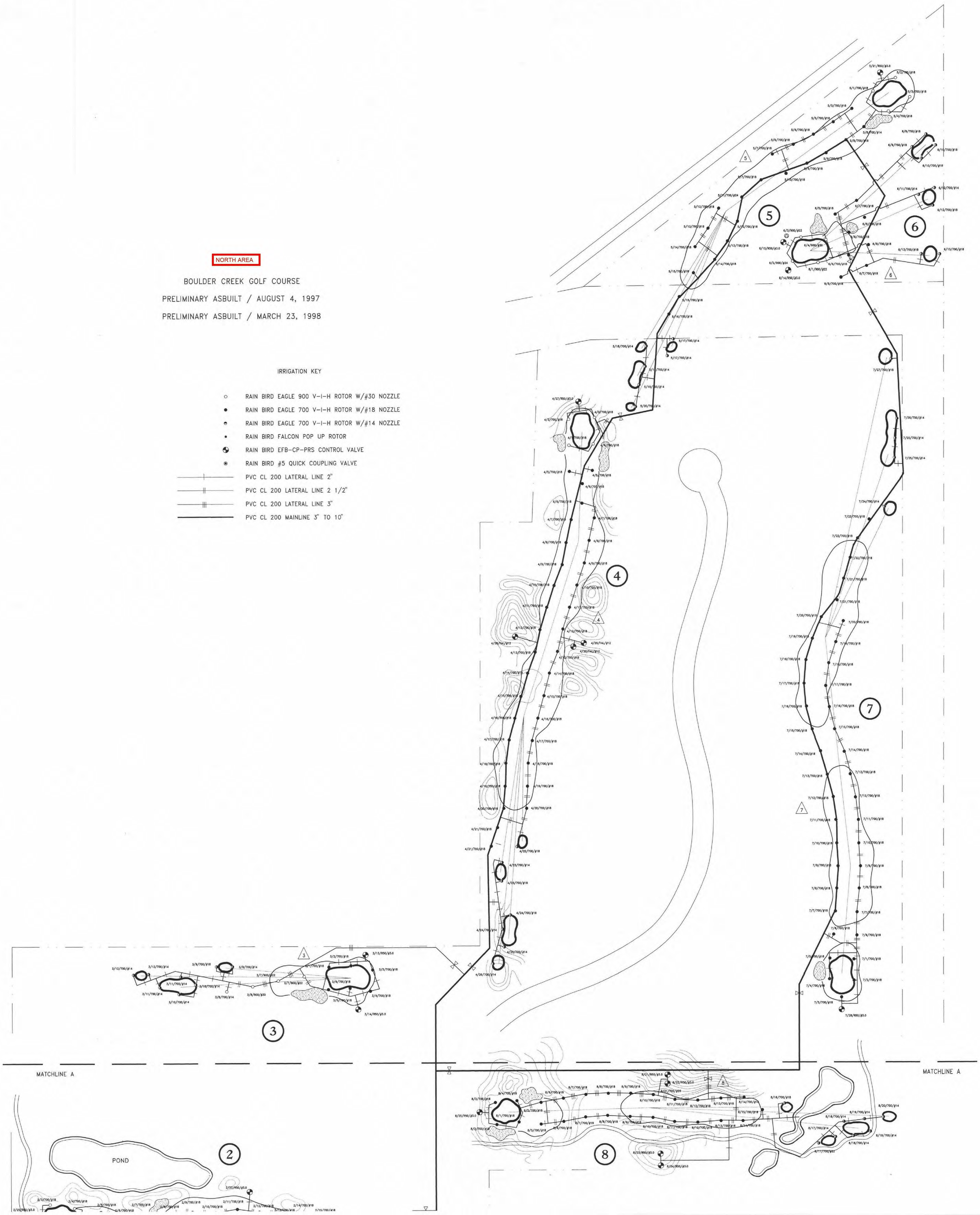
BOULDER CREEK GOLF COURSE

PRELIMINARY ASBUILT / AUGUST 4, 1997

PRELIMINARY ASBUILT / MARCH 23, 1998

IRRIGATION KEY

- RAIN BIRD EAGLE 900 V-I-H ROTOR W/#30 NOZZLE
- RAIN BIRD EAGLE 700 V-I-H ROTOR W/#18 NOZZLE
- RAIN BIRD EAGLE 700 V-I-H ROTOR W/#14 NOZZLE
- RAIN BIRD FALCON POP UP ROTOR
- RAIN BIRD EFB-CP-PRS CONTROL VALVE
- RAIN BIRD #5 QUICK COUPLING VALVE
- PVC CL 200 LATERAL LINE 2"
- PVC CL 200 LATERAL LINE 2 1/2"
- PVC CL 200 LATERAL LINE 3"
- PVC CL 200 MAINLINE 3" TO 10"



SOUTH AREA

BOULDER CREEK GOLF COURSE

PRELIMINARY ASBUILT / AUGUST 4, 1997

PRELIMINARY ASBUILT / MARCH 23, 1998

IRRIGATION KEY

- RAIN BIRD EAGLE 900 V-I-H ROTOR W/#30 NOZZLE
- RAIN BIRD EAGLE 700 V-I-H ROTOR W/#18 NOZZLE
- RAIN BIRD EAGLE 700 V-I-H ROTOR W/#14 NOZZLE
- RAIN BIRD FALCON POP UP ROTOR
- RAIN BIRD EFB-CP-PRS CONTROL VALVE
- RAIN BIRD #5 QUICK COUPLING VALVE
- PVC CL 200 LATERAL LINE 2"
- PVC CL 200 LATERAL LINE 2 1/2"
- PVC CL 200 LATERAL LINE 3"
- PVC CL 200 MAINLINE 3" TO 10"

MATCHLINE B

MATCHLINE B

MAINTENANCE AREA

MAINTENANCE AREA

CONSUMERS POWER CO. - R.O.W.

POND

STREAM

RESIDENTIAL AREA

LAKE

CANNONSBURG ROAD

18

17

16

15

14

13

12

11

Appendix 3

Soil Samples Description

07/14/1996; revised 02/16/2000

Scope: The following SOP presents soil description guidelines for logging soil samples collected during field activities. The guidance provided in this SOP is an adaptation of the USCS classification system and the ASTM (Visual-Manual) classification system, *ASTM Standard Method D 2488-93.*

Equipment: Geotechnical Gauge, manuf. By W.F. McCollough, Beltsville, MD

Procedure:

1. Record the following general information where applicable:
   a. Project name and number
   b. Site location
   c. Contractor
   d. Rig type
   e. Borehole purpose
   f. Total depth drilled
   g. Borehole diameter
   h. Drilling method
   i. Abandonment method
   j. Screening instrument
   k. Boring/well number
   l. Start date and time
   m. End date and time
   n. Ground elevation

2. Soil classifications should be documented in the field by the geologist at the time of sampling and should include the following:
   a. Formation breaks and depths.
      If depths are estimated, note on form. Typically, depths/heights should be recorded in feet or fractions thereof (tenths or hundredths). Use of metric measurements may be required for certain projects. Refer to the project work plan.
   b. Length of sampled interval and percentage of sample recovery for each driven (split spoon), thin wall (Shelby), or cored sample.
      Include the sampler type and size (diameter and length). Blow counts should be recorded for driven samplers; ease of penetration for push samplers.
   c. If bedrock is encountered, describe the lithology, mineralogy, degree of weathering and fracturing, and color of the rock. In addition, identify the formation, if known (e.g., Saginaw Formation, Parma Sandstone).
   d. Grain Size.
      Use the grain size gauge on the Geotechnical Gauge to determine grain size classification of sample.
   e. Percentage Composition.
      Refer to comparison chart on the Geotechnical Gauge to determine relative percentages of the different grain size classifications in sample.
   f. Roundness.
      Four categories are considered adequate: angular, sub-angular, sub-rounded or rounded. Refer to the comparison chart on the Geotechnical Gauge for classification.

g. Sorting
Three categories are considered adequate:

Well sorted	90% in 1 or 2 size classes
Moderately sorted	90% in 3 or 4 size classes
Poorly sorted	90% in 5 or more size classes

h. Density.
The density of the soil is based on the ease of penetration. In the case of a driven sampler, the blow counts are used to estimate the soil density.

Very loose	<5 blows per foot
Medium dense	11 to 30 blows per foot
Dense	31 to 50 blows per foot
Very dense	>51 blows per foot

i. Color.
For most projects, a qualitative description of color is all that is required. To maintain consistency in color designations, the standard colors shown on the Geotechnical Gauge should be used.

j. Water/Fluid Content.
The fluid content of a soil should be described and should include a description of the fluid (e.g., water, water with oily sheen, gasoline).

Dry	No wetness on hand when held
Moist	Slight wetness on hand when held
Saturated	Sample drips water or fluid

k. Other Constituents.
Soil samples may contain material other than clay, silt, sand or gravel. Organic matter or debris such as concrete, buried waste or other non-native material may be present. This material should be described in as much detail as possible.

l. Field Screening.
Any odor, staining, and/or PID measurements should be included in the sample description.

Soil Description Guidelines

1. The principal component of the sample should be described first, followed by other components in decreasing order of importance. For the first component, list the particle size (e.g., sand) in capital letters, and percentage rounded to the nearest 5%. This is followed by a modifier denoting grain size, a description of the color, and angularity/roundness. After a description of the principal component of the sample is completed, a description of the second most important constituent is given in a similar manner.
2. After all constituents have been described, the properties describing the sample as a whole are given. These include: sorting, moisture content, odor, staining, unusual color or sheen. Other possible descriptive properties may be sample density, bedding, cementation, mottles, oxidation, voids, plasticity, cohesiveness, other items (roots) and structure.

3. Examples of acceptable soil descriptions are given below:

   Example: SAND: coarse grained (15%), medium grained (80%), red, well sorted, sub-angular, very loose; Traces of gray, silty clay (5%). Moist, hydrocarbon odor, oil sheen.

   Example: CLAYEY SILT: Silt (50%); Clay (25%); Gravel (20%), medium to fine grained, sub-rounded; Sand (5%), coarse grained, rounded. Reddish-brown, very moist, very dense, slightly cohesive, no odor.

   In instances where fill material is encountered, first note that the material is fill, then describe the individual constituents.

   Example: FILL; Sand, coarse grained (50%), medium grained (20%), fine grained (20%), reddish-brown, sub-rounded, loose, moderately sorted, no cohesiveness, dry, no odor. Broken red bricks at 5'-6.5', approx. 2" in diameter.

4. Note that semicolons are used to separate constituents, and commas are used to separate descriptive elements of each constituent. Where applicable, optional descriptors or modifiers may be added (e.g., fossil contents, density, consistency).
5. Color should be indicated after each constituent, assuming that the colors are different for each constituent. However, when the sediment is best described with one overall color or where all constituents have the same color, then the color shall be indicated before the sorting and not after each constituent.
6. Avoid using nonstandard terms or abbreviations. Refer to ASTM Standard Method D 2488-93 or AGI Data Sheets for standard terms and abbreviations.
7. Certain federal and state environmental agencies or projects may require that descriptions strictly adhere to formal classification systems, such as the Unified Soil Classification System.
8. Classifications may be subject to change based upon laboratory tests and/or subsequent review. Any changes in reports and/or boring logs should be made by the project manager or project geologist.

INDUSTRIAL PRETREATMENT PROGRAM PFAS INITIATIVE

PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES (PFAS) MINIMUM LABORATORY ANALYTE LIST

Below is the minimum laboratory PFAS analyte list for analysis of deer, drinking water, groundwater, surface water, soil, wastewater effluent, and landfill leachate collected by Michigan's Departments of Environmental Quality (MDEQ), Health and Human Services (MDHHS), Agriculture and Rural Development, and Natural Resources.

This minimum analyte list was developed based on the potential for these chemicals to be found in Michigan, the availability of the chemical standards used for testing, and the ability of available laboratories to test for these PFAS. This list includes PFAS that can be tested for in drinking water using United States Environmental Protection Agency (USEPA) Method 537 Rev.1.1, which is the only method that should be used when analyzing drinking water samples. Other testing methodology may be used to test for PFAS in other media (**not** drinking water). This list is not exhaustive of PFAS in Michigan's environment.

A fish icon (🐟) precedes those compounds that are also currently being tested for in fish tissue.

Analyte Name	Acronym	Fluorinated Carbon Chain Length	Molecular Formula	CAS Number	USEPA Method 537 Rev. 1.1
🐟 Perfluorotetradecanoic acid	PFTeA	C_{14}	$C_{13}F_{27}COOH$	376-06-7	X
🐟 Perfluorotridecanoic acid	PFTriA	C_{13}	$C_{12}F_{25}COOH$	72629-94-8	X
🐟 Perfluorododecanoic acid	PFDoA	C_{12}	$C_{11}F_{23}COOH$	307-55-1	X
🐟 Perfluoroundecanoic acid	PFUnA	C_{11}	$C_{10}F_{21}COOH$	2058-94-8	X
🐟 Perfluorodecanoic acid	PFDA	C_{10}	$C_9F_{19}COOH$	335-76-2	X
🐟 Perfluorononanoic acid	PFNA	C_9	$C_8F_{17}COOH$	375-95-1	X
🐟 Perfluorooctanoic acid	PFOA	C_8	$C_7F_{15}COOH$	335-67-1	X
🐟 Perfluoroheptanoic acid	PFHpA	C_7	$C_6F_{13}COOH$	375-85-9	X
🐟 Perfluorohexanoic acid	PFHxA	C_6	$C_5F_{11}COOH$	307-24-4	X
🐟 Perfluoropentanoic acid	PFPeA	C_5	C_4F_9COOH	2706-90-3	
🐟 Perfluorobutanoic acid	PFBA	C_4	C_3F_7COOH	375-22-4	
🐟 Perfluorodecanesulfonic acid	PFDS	C_{10}	$C_{10}F_{21}SO_3H$	335-77-3	
Perfluorononanesulfonic acid	PFNS	C_9	$C_9F_{19}SO_3H$	68259-12-1	
🐟 Perfluorooctanesulfonic acid	PFOS	C_8	$C_8F_{17}SO_3H$	1763-23-1	X
Perfluoroheptanesulfonic acid	PFHpS	C_7	$C_7F_{15}SO_3H$	375-92-8	
🐟 Perfluorohexanesulfonic acid	PFHxS	C_6	$C_6F_{13}SO_3H$	355-46-4	X
Perfluoropentanesulfonic acid	PFPeS	C_5	$C_5F_{11}SO_3H$	2706-91-4	

Analyte Name	Acronym	Fluorinated Carbon Chain Length	Molecular Formula	CAS Number	USEPA Method 537 Rev. 1.1
Perfluorobutanesulfonic acid	PFBS	C_{4OMG}	$C_4F_9SO_3H$	375-73-5	X
Perfluorooctanesulfonamide	PFOSA	C_8	$C_8F_{17}SO_2NH_2$	754-91-6	
Fluorotelomer sulphonic acid 8:2	FtS 8:2	C_8	$C_8F_{17}CH_2CH_2SO_3$	39108-34-4	
Fluorotelomer sulphonic acid 6:2	FtS 6:2	C_6	$C_6F_{13}CH_2CH_2SO_3$	27619-97-2	
Fluorotelomer sulphonic acid 4:2	FtS 4:2	C_4	$C_4F_9CH_2CH_2SO_3$	757124-72-4	
2-(N-Ethylperfluorooctanesulfonamido) acetic acid	N-EtFOSAA	C_8	$C_8F_{17}SO_2N(C_2H_5)CH_2COOH$	2991-50-6	X
2-(N-Methylperfluorooctanesulfonamido) acetic acid	N-MeFOSAA	C_8	$C_8F_{17}SO_2N(CH_3)CHCOOH$	2355-31-9	X

Laboratories Providing PFAS Analytical Services

(*The provision of the following links does not constitute an endorsement of the firms that may be identified by those links, nor is it a statement against any firm not on the lists generated. Additionally, the capacity of any identified laboratories to provide services consistent with the MDEQ recommendations above has not been verified and these details should be addressed prior to contracting with any laboratory.*)

- The **U.S. Environmental Protection Agency (US EPA)** has a list of laboratories approved under the UCMR3 program using US EPA Method 537 Rev. 1.1 for PFAS in drinking water: www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule
- The **U.S. Department of Defense, Environmental Laboratory Accreditation Program (US DoD ELAP)** maintains a list of labs for the determination of PFAS in various environmental media other than drinking water on the Defense Environmental Network Information Exchange (DENIX) server: www.denix.osd.mil/edqw/accreditation/accreditedlabs/

Contact Information

Questions regarding PFAS in general, contact:

- **MDHHS General Information**
  517-373-3740
- MDEQ Environmental Assistance Center
  800-662-9278

Questions regarding laboratory information, contact:

- **MDHHS Chemistry & Toxicology Division**
  517-335-9490
- **MDEQ Drinking Water Analysis Laboratory**
  517-335-8184

Groundwater Sampling Procedure for Per and Polyfluoroalkyl (PFAs)

1/4/2019

Scope: The procedures outlined in this SOP are intended to provide instructions for groundwater sampling activities at monitoring well locations where PFAs contamination is suspected and is to be evaluated at a screening level. While USEPA Method 537 provides basic guidelines for PFAs in drinking water, precautionary procedures have been added to this document to avoid cross contamination when collecting groundwater or drinking water samples. Field personnel should carefully follow the steps described here and use the provided checklists to avoid cross contamination of the samples. Field personnel should also consult the project work plan for additional information.

Discussion: Per and Polyfluoroalkyl (PFAs) are a large group of synthetic fluorine-containing chemicals with unique properties. Perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA) are the only PFAS currently regulated by U.S. EPA and MDEQ and in the past they were used in a wide variety of industrial and commercial products such as textiles, leathers, aqueous film forming foams (AFFF) (which may still be used in emergency scenarios), metal plating, semi-conductors, paper and food packaging, coating additives, cleaning products and pesticides. Well-known PFAs products are Teflon™, which is used in non-stick cookware, Gore-Tex® textiles, Stainmaster® carpets, and Scotchgard™. Further, PFOA and PFOS can also be created by the biotransformation of some fluorinated telomers (i.e., precursor compounds) used in firefighting foams and other surface protection products.

PFAS are very resistant to breakdown, migrate easily, and accumulate in the food chain. As a result, they may be found throughout the environment in groundwater, surface water, soil, and air, as well as in food, breast milk, and human blood serum. While PFAs persistence, bioaccumulation, and ecological toxicity have been proved, their human toxicity is still uncertain.

Sampling for PFAs should be considered at locations where the following activities may have occurred: facilities where PFAs have been manufactured or used; metal coating and plating facilities; former or current DoD sites; facilities storing firefighting foams and firefighting training areas; landfills where leaching of PFAs resulted in contamination to soil and groundwater; and large rail yards. The need to sample soil, groundwater, surface water, sediment, or drinking water for PFAS will depend on case-specific conditions and the disposal site Conceptual Site Model.

Because of the potential presence of PFAs in common consumer products and in equipment typically used to collect soil, groundwater, surface water, sediment, and drinking water samples as well as the need for very low reporting limits, special handling and care must be taken when collecting samples for PFAs analysis to avoid sample contamination.

Equipment:
Pump (Bladder or Peristaltic)
Portable Bladder Pump (Bladder Sampling Only)
Bladder Controller (Bladder Sampling Only)
Nitrogen Gas Cylinder (Bladder Sampling Only)
Flowcell for field parameter measurements
Turbidimeter and calibration kit
Electric water level meter

New High-Density Polyethylene (HPDE) tubing (if location not previously sampled for PFAs)
New Masterflex® silicone tubing (if location not previously sampled for PFAs)
Stop watch
Graduated cylinder
Polyethylene bucket, 5-gallon
Decontamination supplies
PFA-free sampling bottles
Powderless nitrile gloves
Sample labels and bags (for bagging samples bottles and collect sampling waste)
Ink pen for sample labels (no permanent markers)
Cooler containing PFAs-free ice packs
Field notebook

Field gear: Clothing: natural fibers (preferably cotton), laundered without the use of fabric softener (a minimum of 6 times from time of purchase).
Footwear: steel-toed boots made with polyurethane and polyvinyl chloride (PVC).
Disposable nitrile gloves

Field equipment, clothing and personal protective equipment

Field Equipment	
Prohibited	**Acceptable**
Teflon® containing materials	HDPE materials
Low density polyethylene (LDPE) materials	Acetate Liners
	Silicon Tubing
Waterproof field books	Loose paper (non-waterproof)
Plastic clipboards, binders, or spiral hard cover notebooks	Aluminum field clipboards or with Masonite
Sharpies®	Pens
Post-It Notes®	
Chemical (blue) ice packs	Regular ice or certified PFA
Equipment Decontamination	
Prohibited	**Acceptable**
Decon 90®	Alconox® and/or Liquinox®
Sample Containers	
Prohibited	**Acceptable**
LDPE or glass containers	HDPE or polypropylene
Teflon-lined caps	Unlined polypropylene caps
Field Clothing and PPE	
Prohibited	**Acceptable**
New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing containing Gore-Tex™	Well-laundered clothing made of natural fibers (preferably cotton)
Clothing laundered using fabric softener	No fabric softener

Boots containing Gore-Tex™	Boots made with polyurethane and PVC
Tyvek®	Cotton clothing
No cosmetics, moisturizers, hand cream, or other related products as part of personal cleaning/showering routine on the morning of sampling	Sunscreens - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Insect Repellents - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics Sunscreen and insect repellant - Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion
Rain Events	
Prohibited	**Acceptable**
Waterproof or resistant rain gear	Gazebo tent that is only touched or moved prior to and following sampling activities
Food Considerations	
Prohibited	**Acceptable**
All food and drink, with exceptions noted on right	Bottled water and hydration fluids (i.e, Gatorade® and Powerade®) to be brought and consumed only in the staging areas
Fast food wrappers and containers and pre-wrapped foods and snacks (chocolate bars, energy bars, granola bars, potato chips, etc.)	Use rigid plastic container or bags or stainless-steel containers for all food brought to site

Reference:

USEPA Method 537
(https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=525468)

Navy Field Sampling Protocols for PFASs
(http://www.secnav.navy.mil/eie/Documents/15-12-24-BUMED-PFAS-Memo-Signed-w-Enclosures.pdf)

Interim Guideline on the Assessment and Management of Perfluoroalkyl and, Polyfluoroalkyl Substances (PFAS), Department of Environment Regulation, Western Australia, 2016.
(https://www.der.wa.gov.au/images/documents/your-environment/contaminated-sites/guidelines/Guideline-on-Assessment-and-Management-of-PFAS-.pdf)

FTCH Standard Operating Procedure SOP 10-01

FTCH Standard Operating Procedure SOP 10-03

FTCH Standard Operating Procedure SOP 10-02

FTCH Standard Operating Procedure SOP 10-06

FTCH Standard Operating Procedure SOP 10-07

FTCH Standard Operating Procedure SOP 10-09

FTCH Standard Operating Procedure SOP 10-11

FTCH Standard Operating Procedure SOP 11-08

FTCH Standard Operating Procedure SOP 11-10

Procedure:

1. Determine the order in which the wells should be sampled. Typically, sampling order should proceed from the cleanest well to the most contaminated. When no historical water quality data are available, sample background wells first, followed by the farthest downgradient wells. The wells expected to be most significantly contaminated should be sampled last. Sampling order is not as critical when a peristaltic pump is used as the pump tubing may be dedicated to the well location or replaced after each use.
2. Wash and dry hands (use PFAS-free deionized water and Liquinox solution for this purpose). Don powderless nitrile gloves. Disposable nitrile gloves must be worn at all times. A new pair of nitrile gloves should be donned prior to decontamination of re-usable sampling equipment, contact with sample bottles, completion of well purging, prior to sample collection, after handling of any non-dedicated sampling equipment, contact with non-decontaminated surfaces, or when judged necessary by field personnel.
3. Calibrate field measurement equipment as required by the project work plan.
4. Record the condition of the monitoring well in the field notes. Additional information may be required for documentation before, during, and after groundwater sampling. Refer to the project-specific work plan and SOP 10-03 for additional information.
5. Determine static water level using SOP 18-04 and record data in the field notebook. Every effort should be made to minimize disturbances of the stagnant water column during water level measurement.

   Water levels are measured prior to and during a groundwater sampling event for the following reasons:

   a. To assess whether the static water elevation is sufficient to allow purging and sampling after groundwater drawdown has stabilized.

   b. To select the depth to which the pump intake or other purging or sampling device should be lowered.

   c. To monitor the water level during purging and sampling and determine the optimum pumping rate to minimize drawdown.

   d. To determine groundwater flow direction.
6. Check condition of tubing before proceeding. If uncertain tubing is HDPE, then replace. If tubing appears to be old, friable, heavily stained, then replace.
7. If using a peristaltic pump, connect designated tubing to pump and adjust down hole tubing to desired screen depth using the steps described on FTCH SOP 10-02.

If using a bladder pump, remove existing tubing carefully and coil to prevent contact with ground (dirt, grass, debris, etc.). Connect tubing to pump and lower carefully into well to desired screen depth using SOP 10-02.

8. When purging wells screened in low-permeability formations (<0.1 L/min recharge), be cautious to not draw the water column below top of well screen. Introducing atmospheric conditions to the screened area has in some situations had adverse effects on water chemistry, biological activity, and even filter pack properties. Select a purging rate that results in minimum drawdown while allowing the well to be purged in a reasonable length of time. Refer to historical field sampling notes if available.

   Record purge start time in the field notebook. Monitor and record the water level and pumping rate every 3 – 5 minutes (or as appropriate) during purging. Use a plastic graduated cylinder or beaker to monitor the pumping rate and a 5-gallon bucket to monitor the volume of water purged. Dispose of purge water in accordance with the project work plan. Record any pumping rate adjustments on the sample collection form.

   During pump start-up, drawdown may exceed the 0.3 ft. target and then recover as the pump flow adjustments are made. Purge volume calculations should utilize the stabilized drawdown value, not the initial drawdown.

9. Pending clarity/aesthetics of water initially purged, connect tubing discharge end to the flow cell. Adjust flow from the spigot to not more than 0.5 liters per minute. Record values for pH, Eh, dissolved oxygen temperature and turbidity at approximately 3-minute intervals until parameter values indicate stability. While pH, Eh, dissolved oxygen, and turbidity are recorded for monitoring stability, temperature is only recorded but not used as an indicator for formation water. See FTCH SOP 10-02 and 11-10 for stabilization parameters and flow cell operation. If allowed, a minimum of 5 liters of water should be purged from the sample point prior to sampling. Complete and sign the groundwater collection sheet.
10. Once field parameters have stabilized or 45 minutes has lapsed from purge start. Disconnect tubing discharge end from flowcell. Collect all other water samples prior to PFAs samples following FTCH SOP 10-01, 10-10, 10-11.
11. Change nitrile gloves. For each sample location, typically two bottles of well water shall be collected. Volume collected may vary among laboratories. Fill the sample bottle to the shoulder. Cap the sample bottle when full.
12. Place sample bottle labels on the sample bottles. Time/date and initial the sample bottle labels. Sample bottle labels will be completed using pen (no markers) after caps have been placed and tightened on each bottle.
13. Sealed labeled bottles should be double bagged and placed in cooler containing ice. The samples must be kept sealed, double bagged, and on ice from time of collection and shipment until extraction.
14. Complete the chain of custody.
15. Disconnect tubing from peristaltic pump. Remove electric water level meter probe from well and re-insert tubing as initially found. Lock/Bolt down well cover.

    If using bladder pump, disconnect nitrogen line from bladder tubing. Remove electric water level meter probe from well. Remove bladder tubing/bladder pump from well to disconnect pump. Re-insert tubing as

initially found and lock/Bolt down well cover. Decontaminate bladder pump and other equipment in accordance to FTCH SOP 10-01.

16. Remove nitrile gloves and wash hands (use di water and Liquinox solution for this purpose). Place gloves and associated solid wastes in a zip lock bag for disposal at FTCH.
17. Transport samples back to FTCH for packing and shipment to the appropriate analytical laboratory.

Sample shipment and storage:

Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. All samples must be sent for priority next day delivery and cannot be shipped on Fridays.

Residential Sampling Procedure for Per and Polyfluoroalkyl (PFAs)

10/24/2017; revised 10/31/2017

Scope: The procedures outlined in this SOP are intended to provide instructions for water sampling activities at residential locations where PFAs contamination is suspected and is to be evaluated at a screening level. While USEPA Method 537 provides basic guidelines for PFAs in drinking water, precautionary procedures have been added to this document to avoid cross contamination when collecting groundwater or drinking water samples. Field personnel should carefully follow the steps described here and use the provided checklists to avoid cross contamination of the samples. Field personnel should also consult the project work plan for additional information.

Discussion: Per and Polyfluoroalkyl (PFAs) are a large group of synthetic fluorine-containing chemicals with unique properties. Perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA) are the most common PFAs used in a wide variety of industrial and commercial products such as textiles, leathers, aqueous film forming foams (AFFF), metal plating, semi-conductors, paper and food packaging, coating additives, cleaning products and pesticides. Well-known PFAs products are Teflon™, which is used in non-stick cookware, Gore-Tex® textiles, Stainmaster® carpets, and Scotchgard™. Further, PFOA and PFOS can also be created by the biotransformation of some fluorinated telomers (i.e., precursor compounds) used in firefighting foams and other surface protection products.

PFAS are very resistant to breakdown, migrate easily, and accumulate in the food chain. As a result, they may be found throughout the environment in groundwater, surface water, soil, and air, as well as in food, breast milk, and human blood serum. While PFAs persistence, bioaccumulation, and ecological toxicity have been proved, their human toxicity is still uncertain.

Sampling for PFAs should be considered at locations where the following activities may have occurred: facilities where PFAs have been manufactured or used; metal coating and plating facilities; former or current DoD sites; facilities storing firefighting foams and firefighting training areas; landfills where leaching of PFAs resulted in contamination to soil and groundwater; and large rail yards. The need to sample soil, groundwater, surface water, sediment, or drinking water for PFAS will depend on case-specific conditions and the disposal site Conceptual Site Model.

Because of the potential presence of PFAs in common consumer products and in equipment typically used to collect soil, groundwater, surface water, sediment, and drinking water samples as well as the need for very low reporting limits, special handling and care must be taken when collecting samples for PFAs analysis to avoid sample contamination.

Equipment:
Flowcell for field parameter measurements
Turbidimeter and calibration kit
Spigot adapter and high-density polyethylene (HPDE) food-grade tubing
Stop watch
Graduated cylinder
Polyethylene bucket, 5-gallon
Decontamination supplies
PFA-free sampling bottles

Sample labels and bags (for bagging samples bottles and collect sampling waste)
Cooler containing PFAs-free ice packs
Field notebook

Field gear: Clothing: natural fibers (preferably cotton), laundered without the use of fabric softener (a minimum of 6 times from time of purchase).
Footwear: steel-toed boots made with polyurethane and polyvinyl chloride (PVC).
Disposable nitrile gloves

Field equipment, clothing and personal protective equipment

Field Equipment	
Prohibited	**Acceptable**
Teflon® containing materials	HDPE materials
Low density polyethylene (LDPE) materials	Acetate Liners
	Silicon Tubing
Waterproof field books	Loose paper (non-waterproof)
Plastic clipboards, binders, or spiral hard cover notebooks	Aluminum field clipboards or with Masonite
Sharpies®	Pens
Post-It Notes®	
Chemical (blue) ice packs	Regular ice or certified PFA
Equipment Decontamination	
Prohibited	**Acceptable**
Decon 90®	Alconox® and/or Liquinox®
Sample Containers	
Prohibited	**Acceptable**
LDPE or glass containers	HDPE or polypropylene
Teflon-lined caps	Unlined polypropylene caps
Field Clothing and PPE	
Prohibited	**Acceptable**
New cotton clothing or synthetic water resistant, waterproof, or stain-treated clothing, clothing containing Gore-Tex™	Well-laundered clothing made of natural fibers (preferably cotton)
Clothing laundered using fabric softener	No fabric softener
Boots containing Gore-Tex™	Boots made with polyurethane and PVC
Tyvek®	Cotton clothing
No cosmetics, moisturizers, hand cream, or other related products as part of personal cleaning/showering routine on the morning of sampling	Sunscreens - Alba Organics Natural Sunscreen, Yes To Cucumbers, Aubrey Organics, Jason Natural Sun Insect Repellents - Jason Natural Quit Bugging Me, Repel Lemon Eucalyptus Insect repellant, Herbal Armor, California Baby Natural Bug Spray, BabyGanics Sunscreen and insect repellant - Avon Skin So Soft Bug Guard Plus – SPF 30 Lotion

Rain Events	
Prohibited	**Acceptable**
Waterproof or resistant rain gear	Gazebo tent that is only touched or moved prior to and following sampling activities
Food Considerations	
Prohibited	**Acceptable**
All food and drink, with exceptions noted on right	Bottled water and hydration fluids (i.e, Gatorade® and Powerade®) to be brought and consumed only in the staging areas
Fast food wrappers and containers and pre-wrapped foods and snacks (chocolate bars, energy bars, granola bars, potato chips, etc.)	Use rigid plastic container or bags or stainless steel containers for all food brought to site

Reference: USEPA Method 537 (https://cfpub.epa.gov/si/si_public_file_download.cfm?p_download_id=525468)

Navy Field Sampling Protocols for PFASs (http://www.secnav.navy.mil/eie/Documents/15-12-24-BUMED-PFAS-Memo-Signed-w-Enclosures.pdf)

Interim Guideline on the Assessment and Management of Perfluoroalkyl and, Polyfluoroalkyl Substances (PFAS), Department of Environment Regulation, Western Australia, 2016. (https://www.der.wa.gov.au/images/documents/your-environment/contaminated-sites/guidelines/Guideline-on-Assessment-and-Management-of-PFAS-.pdf)

Standard Operating Procedure (SOP) for Household and Community Water Sampling (Baseline and Follow-up Study) (https://data.lib.vt.edu/downloads/j67313767)

FTCH Standard Operating Procedure SOP 10-02

FTCH Standard Operating Procedure SOP 11-10

Procedure:

1. Introduce yourself to the resident and briefly explain the purpose for collecting the water sample. Ask the property owner for permission to proceed with sampling. If resident agrees, confirm that agreement has been read, signed, and returned to FTCH via email, and that payment has occurred (or receive form of payment from resident - check nominated to FTCH). If the resident refuses, or payment is not made, express your apologies and leave the residence.
2. Locate the outside spigot(s) indicated on the authorization form and confirm with the resident that they are okay with the selected sampling location. Confirm that the spigot provides cold, untreated water. Complete as much of the paperwork (labels, water collection form and chain of custody) as possible before initiating any sampling activities.
3. Wash and dry hands (use di water and Liquinox solution for this purpose). Don nitrile gloves. Disposable nitrile gloves must be worn at all times. A new pair of nitrile gloves should be donned prior to

decontamination of re-usable sampling equipment, contact with sample bottles, completion of well purging, prior to sample collection, after handling of any non-dedicated sampling equipment, contact with non-decontaminated surfaces, or when judged necessary by field personnel.

4. Install the spigot adapter and sample tubing on the spigot.
5. Connect tubing from the spigot adapter to the flow cell. Adjust flow from the spigot to not more than 0.5 liters per minute. Record values for pH, Eh, dissolved oxygen temperature and turbidity at approximately 3 minute intervals until parameter values indicate stability. While pH, Eh, dissolved oxygen, and turbidity are recorded for the purpose of monitoring stability, temperature is only recorded but not used as an indicator for formation water. See FTCH SOP 10-02 and 11-10 for stabilization parameters and flow cell operation. A minimum of 5 liters of water should be purged from the sample point prior to sampling. Complete and sign the groundwater collection sheet.
6. Remove the spigot adapter. Purge water can be disposed of on the ground.
7. Change nitrile gloves. For each sample location, two 60-milliliter bottles of well water shall be collected. Decrease the flow rate if necessary to prevent overfilling. Fill the sample bottle to the shoulder. Cap the sample bottle when full.
8. Place sample bottle labels on the sample bottles. Time/date and initial the sample bottle labels. Sample bottle labels will be completed using pen (no markers) after caps have been placed and tightened on each bottle.
9. Sealed labeled bottes should be double bagged and placed in cooler containing PFAs-free ice packs. The samples must be kept sealed and double bagged from time of collection and shipment until extraction.
10. Complete the chain of custody.
11. Remove nitrile gloves and wash hands (use di water and Liquinox solution for this purpose). Place gloves and associated solid wastes in a zip lock bag for disposal at FTCH. It is important not leave any sampling supplies behind in the household.
12. Thank the resident.
13. Transport samples back to FTCH for packing and shipment to the appropriate analytical laboratory.

Sample shipment and storage:

Samples must be chilled during shipment and must not exceed 10 °C during the first 48 hours after collection. All samples must be sent for priority next day delivery, and cannot be shipped on Fridays.

QC Documentation - Environmental Division Work Product

Section 1

Project Number:

Project Name:

Project Manager

Document Title

Section 2 — ***Document type***

Report/Letter ☐ Permit ☐ Proposal ☐

Work Plan/QAPP ☐ HASP ☐ Other ☐ _____

Section 3 — ***Check items included for review:***

Draft text ☐ Appendices ☐ Supporting documentation ☐

Figures ☐ Field Notes (QC-reviewed) ☐

Tables ☐ Other ☐ _____

Section 4 — ***Draft Text Review (INTERNAL)***

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 5 — ***Figures Review (INTERNAL)***

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 6 — ***Tables Review (INTERNAL)***

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 7 — ***Appendices Review (INTERNAL)***

Date created: _____ Date reviewed: _____ Edits required: ☐ yes

Author: _____ Reviewed by: _____ ☐ no

Comments: _____

Section 8 — ***Review Draft Technical Edits Addressed (if applicable)***

Completed by: _____

Completed on: _____

Section 9 — ***AA Review Draft Preparation/Proofing (if applicable)***

AA: _____

Date: _____

Section 10 — ***PM Review Draft Approval (if applicable)***

PM Signature: _____

Date: _____

Section 11 — ***Client Review Draft Technical Revisions/Edits (if applicable)***

Edits required: ☐ yes ☐ no

Section 12 — ***Final Technical Revisions/Edits***

Completed by: _____

Date: _____

Section 13 — ***AA Final Report Preparation/Proofing***

AA: _____

Date: _____

Section 14 — ***Final Document Approval***

PM Signature: _____ Date: _____

Appendix 4

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Tel: (916)373-5600

Laboratory Job ID: 320-60286-1
Client Project/Site: NE Gravel - 181258

For:
Fishbeck Thompson Carr & Huber Inc
1515 Arboretum Drive SE
Grand Rapids, Michigan 49546

Attn: Dan Greene

Patrick O'Meara

Authorized for release by:
4/21/2020 4:36:56 PM
Patrick O'Meara, Manager of Project Management
(330)966-5725
patrick.omeara@testamericainc.com

Designee for

Kris Brooks, Project Manager II
(330)966-9790
kris.brooks@testamericainc.com

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

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

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

Table of Contents

Definitions/Glossary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 320-60286-1
Project/Site: NE Gravel - 181258

Qualifiers

LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 320-60286-1

Laboratory: Eurofins TestAmerica, Sacramento

Narrative

CASE NARRATIVE

Client: Fishbeck Thompson Carr & Huber Inc

Project: NE Gravel - 181258

Report Number: 320-60286-1

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

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

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

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

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

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

RECEIPT

The sample was received on 4/18/2020 9:30 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6° C.

PERFLUORINATED ALKYL ACIDS

Sample NEG-20-04-DW-4320 7 Mile Rd NE(I) (320-60286-1) was analyzed for Perfluorinated Alkyl Acids in accordance with EPA 537.1. The samples were prepared and analyzed on 04/20/2020.

Method 537.1 DW: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-373485.

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

Detection Summary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 320-60286-1
Project/Site: NE Gravel - 181258

Client Sample ID: NEG-20-04-DW-4320 7 Mile Rd NE(I)
Lab Sample ID: 320-60286-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluorobutanesulfonic acid (PFBS)	0.0059		0.0018	0.00046	ug/L	1		537.1 DW	Total/NA
Perfluorohexanesulfonic acid (PFHxS)	0.00065	J	0.0018	0.00046	ug/L	1		537.1 DW	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: NE Gravel - 181258

Job ID: 320-60286-1

Client Sample ID: NEG-20-04-DW-4320 7 Mile Rd NE(I)

Date Collected: 04/17/20 10:58
Date Received: 04/18/20 09:30

Lab Sample ID: 320-60286-1

Matrix: Water

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluoroheptanoic acid (PFHpA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorooctanoic acid (PFOA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorononanoic acid (PFNA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorodecanoic acid (PFDA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluoroundecanoic acid (PFUnA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorododecanoic acid (PFDoA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorotridecanoic acid (PFTriA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorotetradecanoic acid (PFTeA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorobutanesulfonic acid (PFBS)	**0.0059**		0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorohexanesulfonic acid (PFHxS)	**0.00065**	**J**	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Perfluorooctanesulfonic acid (PFOS)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.00046	U	0.0018	0.00046	ug/L		04/20/20 04:47	04/20/20 16:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*70 - 130*	*04/20/20 04:47*	*04/20/20 16:04*	*1*
13C2 PFDA	*92*		*70 - 130*	*04/20/20 04:47*	*04/20/20 16:04*	*1*
d5-NEtFOSAA	*85*		*70 - 130*	*04/20/20 04:47*	*04/20/20 16:04*	*1*
13C3 HFPO-DA	*95*		*70 - 130*	*04/20/20 04:47*	*04/20/20 16:04*	*1*

Surrogate Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: NE Gravel - 181258

Job ID: 320-60286-1

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	PFHxA (70-130)	PFDA (70-130)	d5NEFOS (70-130)	HFPODA (70-130)
320-60286-1	NEG-20-04-DW-4320 7 Mile Rd	96	92	85	95
LCS 320-373485/2-A	Lab Control Sample	100	97	90	98
LCSD 320-373485/3-A	Lab Control Sample Dup	95	94	94	96
MB 320-373485/1-A	Method Blank	96	97	95	94

Surrogate Legend

PFHxA = 13C2 PFHxA
PFDA = 13C2 PFDA
d5NEFOS = d5-NEtFOSAA
HFPODA = 13C3 HFPO-DA

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS)

Lab Sample ID: MB 320-373485/1-A
Matrix: Water
Analysis Batch: 373647

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 373485

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluoroheptanoic acid (PFHpA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorooctanoic acid (PFOA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorononanoic acid (PFNA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorodecanoic acid (PFDA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluoroundecanoic acid (PFUnA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorododecanoic acid (PFDoA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorotridecanoic acid (PFTriA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorotetradecanoic acid (PFTeA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorobutanesulfonic acid (PFBS)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorohexanesulfonic acid (PFHxS)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Perfluorooctanesulfonic acid (PFOS)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.00050	U	0.0020	0.00050	ug/L		04/20/20 04:47	04/20/20 15:56	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFHxA	*96*		*70 - 130*	*04/20/20 04:47*	*04/20/20 15:56*	*1*
13C2 PFDA	*97*		*70 - 130*	*04/20/20 04:47*	*04/20/20 15:56*	*1*
d5-NEtFOSAA	*95*		*70 - 130*	*04/20/20 04:47*	*04/20/20 15:56*	*1*
13C3 HFPO-DA	*94*		*70 - 130*	*04/20/20 04:47*	*04/20/20 15:56*	*1*

Lab Sample ID: LCS 320-373485/2-A
Matrix: Water
Analysis Batch: 373647

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 373485

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanoic acid (PFHxA)	0.200	0.172		ug/L		86	70 - 130
Perfluoroheptanoic acid (PFHpA)	0.200	0.174		ug/L		87	70 - 130
Perfluorooctanoic acid (PFOA)	0.200	0.168		ug/L		84	70 - 130
Perfluorononanoic acid (PFNA)	0.200	0.176		ug/L		88	70 - 130
Perfluorodecanoic acid (PFDA)	0.200	0.194		ug/L		97	70 - 130
Perfluoroundecanoic acid (PFUnA)	0.200	0.173		ug/L		86	70 - 130
Perfluorododecanoic acid (PFDoA)	0.200	0.168		ug/L		84	70 - 130
Perfluorotridecanoic acid (PFTriA)	0.200	0.163		ug/L		82	70 - 130
Perfluorotetradecanoic acid (PFTeA)	0.200	0.153		ug/L		77	70 - 130
Perfluorobutanesulfonic acid (PFBS)	0.177	0.161		ug/L		91	70 - 130

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCS 320-373485/2-A
Matrix: Water
Analysis Batch: 373647

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 373485

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorohexanesulfonic acid (PFHxS)	0.182	0.162		ug/L		89	70 - 130
Perfluorooctanesulfonic acid (PFOS)	0.186	0.171		ug/L		92	70 - 130
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.200	0.160		ug/L		80	70 - 130
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.200	0.154		ug/L		77	70 - 130
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	0.186	0.181		ug/L		97	70 - 130
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	0.188	0.149		ug/L		79	70 - 130
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	0.200	0.198		ug/L		99	70 - 130
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.188	0.145		ug/L		77	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C2 PFHxA	*100*		*70 - 130*
13C2 PFDA	*97*		*70 - 130*
d5-NEtFOSAA	*90*		*70 - 130*
13C3 HFPO-DA	*98*		*70 - 130*

Lab Sample ID: LCSD 320-373485/3-A
Matrix: Water
Analysis Batch: 373647

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 373485

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Perfluorohexanoic acid (PFHxA)	0.200	0.168		ug/L		84	70 - 130	3	30
Perfluoroheptanoic acid (PFHpA)	0.200	0.171		ug/L		85	70 - 130	2	30
Perfluorooctanoic acid (PFOA)	0.200	0.160		ug/L		80	70 - 130	5	30
Perfluorononanoic acid (PFNA)	0.200	0.165		ug/L		83	70 - 130	7	30
Perfluorodecanoic acid (PFDA)	0.200	0.191		ug/L		95	70 - 130	2	30
Perfluoroundecanoic acid (PFUnA)	0.200	0.175		ug/L		88	70 - 130	1	30
Perfluorododecanoic acid (PFDoA)	0.200	0.170		ug/L		85	70 - 130	1	30
Perfluorotridecanoic acid (PFTriA)	0.200	0.168		ug/L		84	70 - 130	3	30
Perfluorotetradecanoic acid (PFTeA)	0.200	0.154		ug/L		77	70 - 130	1	30
Perfluorobutanesulfonic acid (PFBS)	0.177	0.167		ug/L		94	70 - 130	3	30
Perfluorohexanesulfonic acid (PFHxS)	0.182	0.163		ug/L		89	70 - 130	0	30
Perfluorooctanesulfonic acid (PFOS)	0.186	0.169		ug/L		91	70 - 130	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.200	0.165		ug/L		83	70 - 130	3	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.200	0.170		ug/L		85	70 - 130	10	30
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	0.186	0.181		ug/L		97	70 - 130	0	30

Method: 537.1 DW - Perfluorinated Alkyl Acids (LC/MS) (Continued)

Lab Sample ID: LCSD 320-373485/3-A
Matrix: Water
Analysis Batch: 373647

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 373485

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF	0.188	0.161		ug/L		85	70 - 130	7	30
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	0.200	0.189		ug/L		95	70 - 130	5	30
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.188	0.136		ug/L		72	70 - 130	6	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C2 PFHxA	*95*		*70 - 130*
13C2 PFDA	*94*		*70 - 130*
d5-NEtFOSAA	*94*		*70 - 130*
13C3 HFPO-DA	*96*		*70 - 130*

QC Association Summary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 320-60286-1
Project/Site: NE Gravel - 181258

LCMS

Prep Batch: 373485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-60286-1	NEG-20-04-DW-4320 7 Mile Rd NE(I)	Total/NA	Water	537.1 DW	
MB 320-373485/1-A	Method Blank	Total/NA	Water	537.1 DW	
LCS 320-373485/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	
LCSD 320-373485/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	

Analysis Batch: 373647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-60286-1	NEG-20-04-DW-4320 7 Mile Rd NE(I)	Total/NA	Water	537.1 DW	373485
MB 320-373485/1-A	Method Blank	Total/NA	Water	537.1 DW	373485
LCS 320-373485/2-A	Lab Control Sample	Total/NA	Water	537.1 DW	373485
LCSD 320-373485/3-A	Lab Control Sample Dup	Total/NA	Water	537.1 DW	373485

Lab Chronicle

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 320-60286-1
Project/Site: NE Gravel - 181258

Client Sample ID: NEG-20-04-DW-4320 7 Mile Rd NE(I)
Lab Sample ID: 320-60286-1

Date Collected: 04/17/20 10:58
Matrix: Water
Date Received: 04/18/20 09:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	537.1 DW			270.4 mL	1.00 mL	373485	04/20/20 04:47	MA	TAL SAC
Total/NA	Analysis	537.1 DW		1			373647	04/20/20 16:04	P1N	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Accreditation/Certification Summary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 320-60286-1
Project/Site: NE Gravel - 181258

Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	01-20-21
ANAB	Dept. of Defense ELAP	L2468	01-20-21
ANAB	Dept. of Energy	L2468.01	01-20-21
ANAB	ISO/IEC 17025	L2468	01-20-21
Arizona	State	AZ0708	08-11-20
Arkansas DEQ	State	19-042-0	06-17-20
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-20
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-20
Georgia	State	4040	01-30-21
Hawaii	State	<cert No.>	01-29-21
Illinois	NELAP	200060	03-17-21
Kansas	NELAP	E-10375	10-31-20
Louisiana	NELAP	01944	06-30-20
Maine	State	2018009	04-14-22
Michigan	State	9947	01-29-20 *
Nevada	State	CA000442020-1	07-31-20
New Jersey	NELAP	CA005	06-30-20
New York	NELAP	11666	04-01-21
Oregon	NELAP	4040	01-29-21
Pennsylvania	NELAP	68-01272	03-31-21
Texas	NELAP	T104704399-19-13	05-31-20
US Fish & Wildlife	US Federal Programs	58448	07-31-20
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442019-01	02-28-21
Vermont	State	VT-4040	04-16-21
Virginia	NELAP	460278	03-14-21
Washington	State	C581	05-05-20
West Virginia (DW)	State	9930C	12-31-20
Wyoming	State Program	8TMS-L	01-28-19 *

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 320-60286-1
Project/Site: NE Gravel - 181258

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-21
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-20 *
Kentucky (UST)	State	112225	02-23-21
Kentucky (WW)	State	KY98016	12-31-20
Minnesota	NELAP	OH00048	12-31-20
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20 *
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-21
West Virginia DEP	State	210	12-31-20

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: NE Gravel - 181258

Job ID: 320-60286-1

Method	Method Description	Protocol	Laboratory
537.1 DW	Perfluorinated Alkyl Acids (LC/MS)	EPA	TAL SAC
537.1 DW	Extraction of Perfluorinated Alkyl Acids	EPA	TAL SAC

Protocol References:

EPA = US Environmental Protection Agency

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Sample Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: NE Gravel - 181258

Job ID: 320-60286-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-60286-1	NEG-20-04-DW-4320 7 Mile Rd NE(I)	Water	04/17/20 10:58	04/18/20 09:30	

CHAIN OF CUSTODY RECORD

fr&h

Fishbeck, Thompson, Carr & Huber, Inc.
Address: 1515 Arboretum Dr. SE
Grand Rapids, MI 49546
Phone: 616.575.3824

Report to: Penni Mahler
Email: pdmahler@fishbeck.com
Copy to:
Email:

Invoice to: Accounts Payable
Email: acpay@fishbeck.com
Lab Quote Reference:

PROJECT NAME	PROJECT NO.
Northeast Gravel	181258
PROJECT LOCATION	SAMPLER(S) NAME
Rockford, MI	ZJC
PROJECT MANAGER	PHONE 616.464.3876
Dan Gtreene	EMAIL dggreene@fishbeck.com
ADDITIONAL INFORMATION	

Grand Rapids 240508

PAGE 1 of 1

STD TAT [X]
RUSH TAT [ ]
DATE DUE:

SAMPLE DATE	SAMPLE TIME	SAMPLE IDENTIFICATION	MATRIX TYPE: AQUEOUS (WATER)	SOLID/SEMI-SOLID	AIR	NONAQUEOUS LIQUID	REQUIRED ANALYSES: PFAS/537.1/ w/isotope 18 List	PRESERVATIVE: Trizma	NUMBER OF CONTAINERS SUBMITTED	REMARKS
4/17	1058	NEG-20-04-DW-4320 7 Mile Rd NE(I)	X				2			

320-60286 Chain of Custody

RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	RELINQUISHED BY	DATE	TIME	METHOD OF SHIPMENT/TRACKING NUMBER
L. Chojnacki	4/17/20	1135	FedEx	4-17-20	3:00				
RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED BY	DATE	TIME	RECEIVED FOR LAB DATE TIME
	4-17-20	11:35	Sabrina Ogan	Fedex	4/18/20	930			

O.k'd

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4/21/2020

DETERMINATION OF SELECTED PER- AND POLYFLUORINATED ALKYL SUBSTANCES IN DRINKING WATER BY SOLID PHASE EXTRACTION AND LIQUID CHROMATOGRAPHY/TANDEM MASS SPECTROMETRY (LC/MS/MS)

1. SCOPE AND APPLICATION

1.1. This is a solid phase extraction (SPE) liquid chromatography/tandem mass spectrometry (LC/MS/MS) method for the determination of selected per- and polyfluorinated alkyl substances (PFAS) in drinking water. Accuracy and precision data have been generated in reagent water and drinking water for the compounds listed in the table below.

Analyte[a]	Acronym	Chemical Abstract Services Registry Number (CASRN)
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6[b]
N-ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA	2991-50-6
N-methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA	2355-31-9
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluorotetradecanoic acid	PFTA	376-06-7
Perfluorotridecanoic acid	PFTrDA	72629-94-8
Perfluoroundecanoic acid	PFUnA	2058-94-8
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9[c]
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	756426-58-1[d]
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4[e]

[a] Some PFAS are commercially available as ammonium, sodium and potassium salts. This method measures all forms of the analytes as anions while the counterion is inconsequential. Analytes may be purchased as acids or as any of the corresponding salts (see Section 7.2.3 regarding correcting the analyte concentration for the salt content).
[b] HFPO-DA is one component of the GenX processing aid technology.
[c] 11Cl-PF3OUdS is available in salt form (e.g. CASRN of potassium salt is 83329-89-9).
[d] 9Cl-PF3ONS analyte is available in salt form (e.g. CASRN of potassium salt is 73606-19-6)
[e] ADONA is available as the sodium salt (no CASRN) and the ammonium salt (CASRN is 958445-448).

1.2. Minimum Reporting Level (MRL) is the lowest analyte concentration that meets Data Quality Objectives (DQOs) that are developed based on the intended use of this

LABORATORY SERVICES REQUEST – FTCH

PROJECT INFORMATION

Number:	181258
Name:	Northeast Rapids Gravel
Manager:	Dan Greene
Sampling Date:	4/16/2020
Laboratory/Location:	Eurofins/Test America

BILLING INFORMATION

FTC&H ■ Quote No. _____
Client ☐

REPORTING INFORMATION

FTC&H ■
Client ☐
Std QC Report (Level II) ■ ← Must specify QC report for all projects
Full Deliverables (Level IV) ☐
Turnaround Time: ■ Standard ☐ Priority: _____

If direct reporting or billing client, please provide information below:

Company Name: _____
Attention: _____
Email Address: _____

REGULATORY PROGRAM (REPORTING LIMITS)

Part 201 ☐
Part 213 ☐
NPDES Permit ☐
Other: Drinking Water

SAMPLE QUANTITY/MATRIX

Indicate number of samples in box provided.
A separate form must be completed per matrix type.

INVESTIGATIVE		Groundwater
		Soil
		Surface Water
	1	Drinking Water
		Wastewater
		Other
QA/QC		Duplicates
		MS/MSDs
		Equipment Blanks
		Field Blanks
		Trip Blanks

ADDITIONAL PROJECT INFORMATION FOR LABORATORY

Requesting 537 .1/drinking water list of 18
Location; 4320 7 Mile Rd. NE(I)

GENERAL CHEMISTRY

Alkalinity, Total	☐	Cyanide, Total	☐	pH	☐	Solids, V.S.	☐
Bicarbonate Alkalinity	☐	Fluoride	☐	Phenols, T.	☐	Specific Conductivity	☐
Carbonate Alkalinity	☐	Hardness	☐	Phosphorus, D.	☐	Specific Gravity	☐
BOD	☐	MBAS (surfactants)	☐	Phosphorus, O.	☐	Sulfate	☐
Chloride	☐	N, Ammonia	☐	Phosphorus, T.	☐	Sulfide	☐
COD	☐	N, Nitrate	☐	Solids, Total	☐	TPH	☐
Color	☐	N, Nitrite	☐	Solids, T.D.	☐	TOC	☐
Cyanide, Amenable	☐	N, Total Kjeldahl	☐	Solids, T.S.	☐		☐
Cyanide, Available	☐	Oil & Grease	☐	Solids, V.	☐		☐

METALS		**DISSOLVED**		**TOTAL**			
Aluminum	☐	Chromium, Hexavalent	☐	Manganese	☐	Sodium	☐
Antimony	☐	Chromium, Total	☐	Mercury	☐	Thallium	☐
Arsenic	☐	Cobalt	☐	Mercury (EPA 1631)	☐	Vanadium	☐
Barium	☐	Copper	☐	Molybdenum	☐	Zinc	☐
Beryllium	☐	Iron	☐	Nickel	☐	Michigan 10	☐
Boron	☐	Lead	☐	Potassium	☐	OM 2/ATT 8/Table 3	☐
Cadmium	☐	Lead (Total, Fine, Coarse)	☐	Selenium	☐		☐
Calcium	☐	Magnesium	☐	Silver	☐		☐

ORGANICS

EPA 601 (Halocarbons)	☐	EPA 608 (Pest/PCBs)	☐	EPA 8270 (PNAs)	☐	EPA 8082 (PCBs)	☐
EPA 602 (Aromatics)	☐	EPA 8260 (VOCs)	☐	EPA 8270 (Acids)	☐	EPA 8015/GRO	☐
EPA 624 (VOCs)	☐	EPA 8260 Plus (VOCs)	☐	EPA 8270 (B/N)	☐	EPA 8015/DRO	☐
EPA 625 (A/BN)	☐	EPA 8270 (SVOCs)	☐	EPA 8081A (Pest)	☐	PFC/537.1/PFOA	■

WASTE CHARACTERIZATION — *Federal regulatory parameters and limits unless specified*

TCLP/Metals	☐	SPLP/SVOCs (A/BN)	☐	ASTM D3987-85/SVOCs	☐	Paint Filter Test	☐
TCLP/SVOCs (Full)	☐	SPLP/PCBs	☐	ASTM D3987-85/Pest & PCBs	☐	Cyanide, Reactive	☐
TCLP/SVOCs (A/BN)	☐	SPLP/Cyanide	☐	ASTM D3987-85/Cyanide	☐	Sulfide, Reactive	☐
TCLP/VOCs	☐	SPLP/Sulfide	☐	ASTM D3987-85/Cyanide	☐	Flash Point	☐
SPLP/Metals	☐	SPLP/VOCs	☐	ASTM D3987-85/Sulfide	☐	pH	☐
SPLP/SVOCs (Full)	☐	SPLP/Hex Cr	☐	ASTM D3987-85/Hex Cr	☐		☐

SAMPLE BOTTLE SPECIFICATION

Project Number: 181258

Project Name: Northeast Gravel

Date: 1/3/2020

SAMPLE INFORMATION

MATRIX: *Drinking Water*

Special Instructions:

QUANTITY

I/MS/MSD				
Investigative	1			
Duplicates				
Equipment Blank				
Trip Blank		*vials per QCTB:*	☐ 1	☐ 2
Field Blank		*vials per QCFB:*	☐ 1	☐ 2

	Parameters	Preservative	Number of containers required: 4 oz clear G	8 oz clear G	16 oz clear G	1 Gallon Ziploc	500 mL amber G	1000 mL amber G	40 mL	125 mL P	250 mL P	500 mL P	1000 mL P
(I) or (D) or QCEB	PFAS/537.1w/isotope 18 List	Trizma									2		
(I/MS/MSD)													

4/21/2020

Login Sample Receipt Checklist

Client: Fishbeck Thompson Carr & Huber Inc

Job Number: 320-60286-1

Login Number: 60286
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins TestAmerica, Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	947944
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Job Number: 240-122370-1

Job Description: NE Gravel - 181258

For:
Fishbeck Thompson Carr & Huber Inc
1515 Arboretum Drive SE
Grand Rapids, MI 49546

Attention: Dan Greene

Approved for release.
Kris M Brooks
Project Manager II
1/2/2020 7:39 PM

Kris M Brooks, Project Manager II
4101 Shuffel Street NW, North Canton, OH, 44720
(330)966-9790
kris.brooks@testamericainc.com
01/02/2020
Revision: 1

Table of Contents

Job Narrative
240-122370-1

Comments
The PFAS in Drinking Water analysis was performed at Eurofins Eaton Laboratory.

Receipt
The samples were received on 11/15/2019 9:40 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.7° C.

Accreditation/Certification Summary

Client: Fishbeck Thompson Carr & Huber Inc
Job ID: 240-122370-1
Project/Site: NE Gravel - 181258

Laboratory: Eurofins TestAmerica, Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
West Virginia DEP	State	210	12-31-19

Method Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: NE Gravel - 181258

Job ID: 240-122370-1

Method	Method Description	Protocol	Laboratory
Subcontract	537.1 Drinking water PFAS (list of 18)	None	Eurofin SB

Protocol References:

None = None

Laboratory References:

Eurofin SB = Eurofins Eaton Analytical, 110 S Hill Street, South Bend, IN 46617

Sample Summary

Client: Fishbeck Thompson Carr & Huber Inc
Project/Site: NE Gravel - 181258

Job ID: 240-122370-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-122370-1	NEG-19-10-DW-4303 SECLUDED LAKE DR NE (I)	Water	11/11/19 13:30	11/15/19 09:40	
240-122370-2	NEG-19-10-DW-4361 7 MILE RD (I)	Water	11/11/19 14:00	11/15/19 09:40	
240-122370-3	NEG-19-10-DW-4361 7 MILE RD (D)	Water	11/11/19 14:00	11/15/19 09:40	
240-122370-4	NEG-19-10-DW-4253 7 MILE RD (I)	Water	11/11/19 14:15	11/15/19 09:40	
240-122370-5	NEG-19-10-DW-4211 7 MILE RD (I)	Water	11/11/19 14:50	11/15/19 09:40	
240-122370-6	NEG-19-10-DW-6237 NORTHLAND DR NE (I)	Water	11/11/19 15:05	11/15/19 09:40	
240-122370-7	NEG-19-10-DW-6410 NORTHLAND DR NE (I)	Water	11/11/19 15:20	11/15/19 09:40	
240-122370-8	NEG-19-10-DW-6494 THIMBLEWEED LANE NE (I)	Water	11/11/19 15:35	11/15/19 09:40	
240-122370-9	NEG-19-10-DW-6516 THIMBLEWEED LANE NE (I)	Water	11/11/19 16:00	11/15/19 09:40	
240-122370-10	NEG-19-10-DW-6522 THIMBLEWEED LANE NE (I)	Water	11/11/19 16:10	11/15/19 09:40	
240-122370-11	NEG-19-10-DW-6532 THIMBLEWEED LANE NE (I)	Water	11/12/19 09:50	11/15/19 09:40	
240-122370-12	NEG-19-10-QCFB-01	Water	11/12/19 10:00	11/15/19 09:40	
240-122370-13	NEG-19-10-DW-6486 THIMBLEWEED LANE NE (I)	Water	11/13/19 10:50	11/15/19 09:40	
240-122370-14	NEG-19-10-DW-4444 SECLUDED LAKE DR NE (I)	Water	11/13/19 11:15	11/15/19 09:40	

Subcontract Data

LABORATORY REPORT

If you have any questions concerning this report, please do not hesitate to call us at (800) 332-4345 or (574) 233-4777.

STATE CERTIFICATION LIST

State	Certification	State	Certification
Alabama	40700	Missouri	880
Alaska	IN00035	Montana	CERT0026
Arizona	AZ0432	Nebraska	NE-OS-05-04
Arkansas	IN00035	Nevada	IN00035
California	2920	New Hampshire*	2124
Colorado	IN00035	New Jersey*	IN598
Colorado Radiochemistry	IN00035	New Mexico	IN00035
Connecticut	PH-0132	New York*	11398
Delaware	IN035	North Carolina	18700
Florida*	E87775	North Dakota	R-035
Georgia	929	Ohio	87775
Hawaii	IN035	Oklahoma	D9508
Idaho	IN00035	Oregon (Primary AB)*	4074
Illinois*	200001	Pennsylvania*	68-00466
Illinois Microbiology	17767	Puerto Rico	IN00035
Illinois Radiochemistry	IN00035	Rhode Island	LAO00343
Indiana Chemistry	C-71-01	South Carolina	95005
Indiana Microbiology	M-76-07	South Dakota	IN00035
Iowa	098	Tennessee	TN02973
Kansas*	E-10233	Texas*	T104704187-18-12
Kentucky	90056	Texas/TCEQ	TX207
Louisiana*	LA014	Utah*	IN00035
Maine	IN00035	Vermont	VT-8775
Maryland	209	Virginia*	460275
Massachusetts	M-IN035	Washington	C837
Michigan	9926	West Virginia	9927 C
Minnesota*	018-999-338	Wisconsin	999766900
Mississippi	IN035	Wyoming	IN035
EPA	IN00035		

*NELAP/TNI Recognized Accreditation Bodies

Revision date: 03/14/2019

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LABORATORY CASE NARRATIVE

Client: TestAmerica - Canton Report #: 471430CNa

All method QC was within acceptance limits.

Note: This report was amended on 01/02/2020 to change the client sample ID's, at the request of the client.

Kelly Blackburn ASM 01/02/2020

Authorized Signature Title Date

Page 1 of 1

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110 South Hill Street
South Bend, IN 46617
Tel: (574) 233-4777
Fax: (574) 233-8207
1 800 332 4345

Laboratory Report

Client: TestAmerica - Canton
Attn: Kris Brooks
4101 Shuffel Street NW
North Canton, OH 44720

Report: 471430A
Priority: Standard Written
Status: Amended

Project: 24023890 / NE Gravel-181258

SUMMARY OF DETECTIONS

Sample ID: 4489512 Sample Site: NEG-19-10-DW 4253 7 Mile Rd I

Parameter	Method	Result	Units	Run #
Perfluorobutanesulfonic acid (PFBS)	537.1	7.4	ng/L	268311

Sample ID: 4489511 Sample Site: NEG-19-10-DW 4361 7 Mile Rd D

Parameter	Method	Result	Units	Run #
Perfluorobutanesulfonic acid (PFBS)	537.1	16	ng/L	268311
Perfluorohexanesulfonic acid (PFHxS)	537.1	12	ng/L	268311
Perfluorooctanesulfonic acid (PFOS)	537.1	8.3	ng/L	268311
Perfluorooctanoic acid (PFOA)	537.1	3.2	ng/L	268311

Sample ID: 4489510 Sample Site: NEG-19-10-DW 4361 7 Mile Rd I

Parameter	Method	Result	Units	Run #
Perfluorobutanesulfonic acid (PFBS)	537.1	16	ng/L	268311
Perfluorohexanesulfonic acid (PFHxS)	537.1	13	ng/L	268311
Perfluorooctanesulfonic acid (PFOS)	537.1	8.6	ng/L	268311
Perfluorooctanoic acid (PFOA)	537.1	3.3	ng/L	268311

Sample ID: 4489514 Sample Site: NEG-19-10-DW 6237 Northland Dr

Parameter	Method	Result	Units	Run #
Perfluorobutanesulfonic acid (PFBS)	537.1	3.6	ng/L	268311
Perfluorooctanesulfonic acid (PFOS)	537.1	3.2	ng/L	268311

Sample ID: 4489515 Sample Site: NEG-19-10-DW 6410 Northland Dr

Parameter	Method	Result	Units	Run #
Perfluorobutanesulfonic acid (PFBS)	537.1	5.7	ng/L	268311
Perfluorohexanesulfonic acid (PFHxS)	537.1	2.9	ng/L	268311
Perfluorohexanoic acid (PFHxA)	537.1	2.3	ng/L	268311
Perfluorooctanesulfonic acid (PFOS)	537.1	10	ng/L	268311
Perfluorooctanoic acid (PFOA)	537.1	6.4	ng/L	268311

SUMMARY OF DETECTIONS - Continued

Sample ID: 4489517 Sample Site: NEG-19-10-DW 6516 Thimbleweed

Parameter	Method	Result	Units	Run #
Perfluorobutanesulfonic acid (PFBS)	537.1	2.9	ng/L	268311
Perfluorohexanesulfonic acid (PFHxS)	537.1	2.6	ng/L	268311

Sample ID: 4489518 Sample Site: NEG-19-10-DW 6522 Thimbleweed

Parameter	Method	Result	Units	Run #
Perfluorohexanesulfonic acid (PFHxS)	537.1	2.7	ng/L	268311

Sample ID: 4489519 Sample Site: NEG-19-10-DW 6532 Thimbleweed

Parameter	Method	Result	Units	Run #
Perfluorobutanesulfonic acid (PFBS)	537.1	2.8	ng/L	268311
Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	ng/L	268311

Note: The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Kelly Blackburn at (574) 233-4777.

Reviewed By Title Date 1/2/2020

Finalized By Title Date

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110 South Hill Street
South Bend, IN 46617
Tel: (574) 233-4777
Fax: (574) 233-8207
1 800 332 4345

Laboratory Report

Client: TestAmerica - Canton

Attn: Kris Brooks
4101 Shuffel Street NW
North Canton, OH 44720

Report: 471430
Priority: Standard Written
Status: Amended
PWS ID: Not Supplied

Sample Information

EEA ID #	Client ID	Method	Collected Date / Time	Collected By:	Received Date / Time
4489507	NEG-19-10-DW 4303 SecludedLkDr	537.1	11/11/19 13:30	Client	11/19/19 08:30
4489510	NEG-19-10-DW 4361 7 Mile Rd I	537.1	11/11/19 14:00	Client	11/19/19 08:30
4489511	NEG-19-10-DW 4361 7 Mile Rd D	537.1	11/11/19 14:00	Client	11/19/19 08:30
4489512	NEG-19-10-DW 4253 7 Mile Rd I	537.1	11/11/19 14:15	Client	11/19/19 08:30
4489513	NEG-19-10-DW 4211 7 Mile Rd I	537.1	11/11/19 14:50	Client	11/19/19 08:30
4489514	NEG-19-10-DW 6237 Northland Dr	537.1	11/11/19 15:05	Client	11/19/19 08:30
4489515	NEG-19-10-DW 6410 Northland Dr	537.1	11/11/19 15:20	Client	11/19/19 08:30
4489516	NEG-19-10-DW 6494 Thimbleweed	537.1	11/11/19 15:35	Client	11/19/19 08:30
4489517	NEG-19-10-DW 6516 Thimbleweed	537.1	11/11/19 16:00	Client	11/19/19 08:30
4489518	NEG-19-10-DW 6522 Thimbleweed	537.1	11/11/19 16:10	Client	11/19/19 08:30
4489519	NEG-19-10-DW 6532 Thimbleweed	537.1	11/12/19 09:50	Client	11/19/19 08:30
4489520	NEG-19-10-QCFB-01	537.1	11/12/19 10:00	Client	11/19/19 08:30
4489521	NEG-19-10-DW 6486 Thimbleweed	537.1	11/13/19 10:50	Client	11/19/19 08:30
4489522	NEG-19-10-DW 4444 SecludedLkDr	537.1	11/13/19 11:15	Client	11/19/19 08:30

Report Summary

Note: See attached page for additional comments.

Project: 24023890 / NE Gravel-181258

Note: Sample containers were provided by the client.

Detailed quantitative results are presented on the following pages. The results presented relate only to the samples provided for analysis.

We appreciate the opportunity to provide you with this analysis. If you have any questions concerning this report, please do not hesitate to call Kelly Blackburn at (574) 233-4777.

Note: This report may not be reproduced, except in full, without written approval from EEA.

Kelly Blackburn ASM

Authorized Signature | Title

01/02/2020
Date

Client Name: TestAmerica - Canton
Report #: 471430

Sampling Point: NEG-19-10-DW 4303 SecludedLkDr PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 06:50	4489507

Sampling Point: NEG-19-10-DW 4361 7 Mile Rd I PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	**3.3**	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	**8.6**	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	**16**	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	**13**	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:41	4489510

Sampling Point: NEG-19-10-DW 4361 7 Mile Rd D PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	**3.2**	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	**8.3**	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	**16**	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	**12**	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 07:58	4489511

Sampling Point: NEG-19-10-DW 4253 7 Mile Rd I PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	**7.4**	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:15	4489512

Sampling Point: NEG-19-10-DW 4211 7 Mile Rd I PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:32	4489513

Sampling Point: NEG-19-10-DW 6237 Northland Dr PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	**3.2**	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	**3.6**	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 08:49	4489514

Sampling Point: NEG-19-10-DW 6410 Northland Dr PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	**6.4**	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	**10**	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	**5.7**	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	**2.9**	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	**2.3**	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:06	4489515

Sampling Point: NEG-19-10-DW 6494 Thimbleweed PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:23	4489516

Sampling Point: NEG-19-10-DW 6516 Thimbleweed PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	**2.9**	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	**2.6**	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:40	4489517

Sampling Point: NEG-19-10-DW 6522 Thimbleweed PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	**2.7**	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 09:57	4489518

Sampling Point: NEG-19-10-DW 6532 Thimbleweed PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	**2.8**	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	**2.0**	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:31	4489519

Sampling Point: NEG-19-10-QCFB-01 PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/20/19 07:35	11/26/19 22:07	4489520

Sampling Point: NEG-19-10-DW 6486 Thimbleweed PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 10:48	4489521

Sampling Point: NEG-19-10-DW 4444 SecludedLkDr PWS ID: Not Supplied

EEA Methods									
Analyte ID #	Analyte	Method	Reg Limit	MRL†	Result	Units	Preparation Date	Analyzed Date	EEA ID #
335-67-1	Perfluorooctanoic acid (PFOA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
1763-23-1	Perfluorooctanesulfonic acid (PFOS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
375-73-5	Perfluorobutanesulfonic acid (PFBS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
375-85-9	Perfluoroheptanoic acid (PFHpA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
355-46-4	Perfluorohexanesulfonic acid (PFHxS)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
375-95-1	Perfluorononanoic acid (PFNA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
335-76-2	Perfluorodecanoic acid (PFDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
307-24-4	Perfluorohexanoic acid (PFHxA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
307-55-1	Perfluorododecanoic acid (PFDoA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
72629-94-8	Perfluorotridecanoic acid (PFTrDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
2058-94-8	Perfluoroundecanoic acid (PFUnA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
2991-50-6	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
2355-31-9	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
13252-13-6	HFPO-DA/GenX	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
958445-44-8	ADONA	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
73606-19-6	9Cl-PF3ONS/F-53B Major	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
83329-89-9	11Cl-PF3OUdS/F-53B Minor	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522
376-06-7	Perfluorotetradecanoic acid (PFTeDA)	537.1	---	2.0	< 2.0	ng/L	11/22/19 08:02	11/25/19 11:05	4489522

† EEA has demonstrated it can achieve these report limits in reagent water, but can not document them in all sample matrices.

Reg Limit Type:	MCL	SMCL	AL
Symbol:	*	^	!

Lab Definitions

Continuing Calibration Check Standard (CCC) / Continuing Calibration Verification (CCV) / Initial Calibration Verification Standard (ICV) / Initial Performance Check (IPC) - is a standard containing one or more of the target analytes that is prepared from the same standards used to calibrate the instrument. This standard is used to verify the calibration curve at the beginning of each analytical sequence, and may also be analyzed throughout and at the end of the sequence. The concentration of continuing standards may be varied, when prescribed by the reference method, so that the range of the calibration curve is verified on a regular basis. CCL, CCM, and CCH are the CCC standards at low, mid, and high concentration levels, respectively.

Internal Standards (IS) - are pure compounds with properties similar to the analytes of interest, which are added to field samples or extracts, calibration standards, and quality control standards at a known concentration. They are used to measure the relative responses of the analytes of interest and surrogates in the sample, calibration standard or quality control standard.

Laboratory Duplicate (LD) - is a field sample aliquot taken from the same sample container in the laboratory and analyzed separately using identical procedures. Analysis of laboratory duplicates provides a measure of the precision of the laboratory procedures.

Laboratory Fortified Blank (LFB) / Laboratory Control Sample (LCS) - is an aliquot of reagent water to which known concentrations of the analytes of interest are added. The LFB is analyzed exactly the same as the field samples. LFBs are used to determine whether the method is in control. FBL, FBM, and FBH are the LFB samples at low, mid, and high concentration levels, respectively.

Laboratory Method Blank (LMB) / Laboratory Reagent Blank (LRB) - is a sample of reagent water included in the sample batch analyzed in the same way as the associated field samples. The LMB is used to determine if method analytes or other background contamination have been introduced during the preparation or analytical procedure. The LMB is analyzed exactly the same as the field samples.

Laboratory Trip Blank (LTB) / Field Reagent Blank (FRB) - is a sample of laboratory reagent water placed in a sample container in the laboratory and treated as a field sample, including storage, preservation, and all analytical procedures. The FRB/LTB container follows the collection bottles to and from the collection site, but the FRB/LTB is not opened at any time during the trip. The FRB/LTB is primarily a travel blank used to verify that the samples were not contaminated during shipment.

Matrix Spike Duplicate Sample (MSD) / Laboratory Fortified Sample Matrix Duplicate (LFSMD) - is a sample aliquot taken from the same field sample source as the Matrix Spike Sample to which known quantities of the analytes of interest are added in the laboratory. The MSD is analyzed exactly the same as the field samples. Analysis of the MSD provides a measure of the precision of the laboratory procedures in a specific matrix. SDL, SDM, and SDH / LFSMDL, LFSMDM, and LFSMDH are the MSD or LFSMD at low, mid, and high concentration levels, respectively.

Matrix Spike Sample (MS) / Laboratory Fortified Sample Matrix (LFSM) - is a sample aliquot taken from field sample source to which known quantities of the analytes of interest are added in the laboratory. The MS is analyzed exactly the same as the field samples. The purpose is to demonstrate recovery of the analytes from a sample matrix to determine if the specific matrix contributes bias to the analytical results. MSL, MSM, and MSH / LFSML, LFSMM, and LFSMH are the MS or LFSM at low, mid, and high concentration levels, respectively.

Quality Control Standard (QCS) / Second Source Calibration Verification (SSCV) - is a solution containing known concentrations of the analytes of interest prepared from a source different from the source of the calibration standards. The solution is obtained from a second manufacturer or lot if the lot can be demonstrated by the manufacturer as prepared independently from other lots. The QCS sample is analyzed using the same procedures as field samples. The QCS is used as a check on the calibration standards used in the method on a routine basis.

Reporting Limit Check (RLC) / Initial Calibration Check Standard (ICCS) - is a procedural standard that is analyzed each day to evaluate instrument performance at or below the minimum reporting limit (MRL).

Surrogate Standard (SS) / Surrogate Analyte (SUR) - is a pure compound with properties similar to the analytes of interest, which is highly unlikely to be found in any field sample, that is added to the field samples, calibration standards, blanks and quality control standards before sample preparation. The SS is used to evaluate the efficiency of the sample preparation process.

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing TestAmerica

385190
471430

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-113875.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kris.brooks@testamericainc.com	State of Origin: Michigan	Page: Page 1 of 2
Company: Eurofins Eaton Analytical		Accreditations Required (See note):		Job #: 240-122370-1
Address: 110 S Hill Street, .	Due Date Requested: 12/6/2019			
City: South Bend	TAT Requested (days):			
State, Zip: IN, 46617				
Phone:	PO #:			
Email:	WO #:			
Project Name: NE Gravel - 181258	Project #: 24023890			
Site:	SSOW#:			

Analysis Requested

Client Provided Sample Container

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (537.1 Drinking water PFAS (list of 18))/ 537.1 Drinking water PFAS (list of 18)											Total Number of containers	Special Instructions/Note:
			Preservation Code:						Ch 4 IP	PH acceptable									
NEG-19-10-DW-4303 SECLUDED LAKE DR NE (I) (240-122370	11/11/19	13:30 Eastern		Water			X		A	✓								4	4489507
NEG-19-10-DW-4303 SECLUDED LAKE DR NE (I) (240-122370	11/11/19	13:30 Eastern	MS	Water			X		A	✓								1	508
NEG-19-10-DW-4303 SECLUDED LAKE DR NE (I) (240-122370	11/11/19	13:30 Eastern	MSD	Water			X		A	✓								1	509
NEG-19-10-DW-4361 7 MILE RD (I) (240-122370-2)	11/11/19	14:00 Eastern		Water			X		A	✓								2	510
NEG-19-10-DW-4361 7 MILE RD (D) (240-122370-3)	11/11/19	14:00 Eastern		Water			X		A	✓								2	511
NEG-19-10-DW-4253 7 MILE RD (I) (240-122370-4)	11/11/19	14:15 Eastern		Water			X		A	✓								2	512
NEG-19-10-DW-4211 7 MILE RD (I) (240-122370-5)	11/11/19	14:50 Eastern		Water			X		A	✓								2	513
NEG-19-10-DW-6237 NORTHLAND DR NE (I) (240-122370-6)	11/11/19	15:05 Eastern		Water			X		A	✓								2	514
NEG-19-10-DW-6410 NORTHLAND DR NE (I) (240-122370-7)	11/11/19	15:20 Eastern		Water			X		A	✓								2	515

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Charles Lee	11-18-19 1302	240	Amanda Hs	11/19/19 0830	EEN-SB
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.2

Ver: 01/16/2019

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Brooks, Kris M	Carrier Tracking No(s):	COC No: 240-113875.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: kris.brooks@testamericainc.com	State of Origin: Michigan	Page: Page 2 of 2
Company: Eurofins Eaton Analytical		Accreditations Required (See note):		Job #: 240-122370-1
Address: 110 S Hill Street, ,	Due Date Requested: 12/6/2019			
City: South Bend	TAT Requested (days):			
State, Zip: IN, 46617				
Phone:	PO #:			
Email:	WO #:			
Project Name: NE Gravel - 181258	Project #: 24023890			
Site:	SSOW#:			

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Analysis Requested

Client Provided Sample Container

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (537.1 Drinking water PFAS (list of 18))/ 537.1 Drinking water PFAS (list of 18)	CC A/P	pH acceptable	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
NEG-19-10-DW-6494 THIMBLEWEED LANE NE (I) (240-122370	11/11/19	15:35 Eastern		Water			X	A	✓	2	4489 516
NEG-19-10-DW-6516 THIMBLEWEED LANE NE (I) (240-122370	11/11/19	16:00 Eastern		Water			X	A	✓	2	517
NEG-19-10-DW-6522 THIMBLEWEED LANE NE (I) (240-122370	11/11/19	16:10 Eastern		Water			X	A	✓	2	518
NEG-19-10-DW-6532 THIMBLEWEED LANE NE (I) (240-122370	11/12/19	09:50 Eastern		Water			X	A	✓	2	519
NEG-19-10-QCFB-01 (240-122370-12)	11/12/19	10:00 Eastern		Water			X	A	✓	1	520
NEG-19-10-DW-6486 THIMBLEWEED LANE NE (I) (240-122370	11/13/19	10:50 Eastern		Water			X	A	✓	2	521
NEG-19-10-DW-4444 SECLUDED LAKE DR NE (I) (240-122370	11/13/19	11:15 Eastern		Water			X	A	✓	2	522

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. I

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	11-18-19 1302	240	[signature]	11/19/19 0830	EEA-SB
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.2

Ver: 01/16/2019

EGLE PERFLUOROALKYL AND POLYFLUOROALKYL SUBSTANCES (PFAS) MINIMUM LABORATORY ANALYTE LIST

Below is the minimum laboratory PFAS analyte list for analysis of deer, drinking water, groundwater, surface water, soil, wastewater effluent, and landfill leachate samples collected by Michigan's Departments of Environment, Great Lakes, and Energy, Health and Human Services, Agriculture and Rural Development, and Natural Resources.

This minimum analyte list was developed based on the potential for these chemicals to be found in Michigan, the availability of the chemical standards used for testing, and the ability of available laboratories to test for these PFAS. This list includes PFAS that can be tested for in drinking water using United States Environmental Protection Agency (USEPA) Methods 537 Rev.1.1 or 537.1, which are the only methods that should be used when analyzing drinking water samples. Other testing methodology may be used to test for PFAS in other media (not drinking water). This list is not exhaustive of PFAS in Michigan's environment.

A fish icon (🐟) precedes those compounds that are also currently being tested for in fish tissue.

Analyte Name	Acronym	Fluorinated Carbon Chain Length	Molecular Formula	CAS Number	USEPA Method 537 Rev. 1.1	USEPA Method 537.1
🐟 Perfluorotetradecanoic acid	PFTeA	C_{14}	$C_{13}F_{27}COOH$	376-06-7	X	X
🐟 Perfluorotridecanoic acid	PFTriA	C_{13}	$C_{12}F_{25}COOH$	72629-94-8	X	X
🐟 Perfluorododecanoic acid	PFDoA	C_{12}	$C_{11}F_{23}COOH$	307-55-1	X	X
🐟 Perfluoroundecanoic acid	PFUnA	C_{11}	$C_{10}F_{21}COOH$	2058-94-8	X	X
🐟 Perfluorodecanoic acid	PFDA	C_{10}	$C_9F_{19}COOH$	335-76-2	X	X
🐟 Perfluorononanoic acid	PFNA	C_9	$C_8F_{17}COOH$	375-95-1	X	X
🐟 Perfluorooctanoic acid	PFOA	C_8	$C_7F_{15}COOH$	335-67-1	X	X
🐟 Perfluoroheptanoic acid	PFHpA	C_7	$C_6F_{13}COOH$	375-85-9	X	X
🐟 Perfluorohexanoic acid	PFHxA	C_6	$C_5F_{11}COOH$	307-24-4	X	X
🐟 Perfluoropentanoic acid	PFPeA	C_5	C_4F_9COOH	2706-90-3		
🐟 Perfluorobutanoic acid	PFBA	C_4	C_3F_7COOH	375-22-4		
🐟 Perfluorodecanesulfonic acid	PFDS	C_{10}	$C_{10}F_{21}SO_3H$	335-77-3		

EGLE Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) Minimum Laboratory Analyte List

	Analyte Name	Acronym	Fluorinated Carbon Chain Length	Molecular Formula	CAS Number	USEPA Method 537 Rev. 1.1	USEPA Method 537.1
	Perfluorononanesulfonic acid	PFNS	C_9	$C_9F_{19}SO_3H$	68259-12-1		
	Perfluorooctanesulfonic acid	PFOS	C_8	$C_8F_{17}SO_3H$	1763-23-1	X	X
	Perfluoroheptanesulfonic acid	PFHpS	C_7	$C_7F_{15}SO_3H$	375-92-8		
	Perfluorohexanesulfonic acid	PFHxS	C_6	$C_6F_{13}SO_3H$	355-46-4	X	X
	Perfluoropentanesulfonic acid	PFPeS	C_5	$C_5F_{11}SO_3H$	2706-91-4		
	Perfluorobutanesulfonic acid	PFBS	C_4	$C_4F_9SO_3H$	375-73-5	X	X
	Perfluorooctanesulfonamide	PFOSA	C_8	$C_8F_{17}SO_2NH_2$	754-91-6		
	Fluorotelomer sulphonic acid 8:2	FtS 8:2	C_8	$C_8F_{17}CH_2CH_2SO_3$	39108-34-4		
	Fluorotelomer sulphonic acid 6:2	FtS 6:2	C_6	$C_6F_{13}CH_2CH_2SO_3$	27619-97-2		
	Fluorotelomer sulphonic acid 4:2	FtS 4:2	C_4	$C_4F_9CH_2CH_2SO_3$	757124-72-4		
	2-(N-Ethylperfluorooctanesulfonamido) acetic acid	N-EtFOSAA	C_8	$C_8F_{17}SO_2N(C_2H_5)CH_2COOH$	2991-50-6	X	X
	2-(N-Methylperfluorooctanesulfonamido) acetic acid	N-MeFOSAA	C_8	$C_8F_{17}SO_2N(CH_3)CHCOOH$	2355-31-9	X	X
	Hexafluoropropylene oxide dimer acid	HFPO-DA	C_6	$C_6HF_{11}O_3$	13252-13-6		X
	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	C_{10}	$C_{10}HF_{20}ClSO_4$	763051-92-9		X
	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	C_8	$C_8HF_{16}ClSO_4$	756426-58-1		X
	4,8-dioxa-3H-perfluorononanoic acid	ADONA	C_7	$C_7H_2F_{12}O_4$	919005-14-4		X

Laboratories Providing PFAS Analytical Services

(The list that turns up in the search results from the following links does not constitute an endorsement of those firms on the list, nor is it a statement against any firm not on the list. Additionally, the capacity of the labs to provide services consistent with EGLE's recommendations above has not been verified and these details should be addressed prior to contracting with the laboratories below.)

The **United States Environmental Protection Agency (US EPA)** has a list of laboratories approved under the UCMR3 program using US EPA Method 537 Rev. 1.1 for PFAS in drinking water:
https://www.epa.gov/dwucmr/third-unregulated-contaminant-monitoring-rule

The **United States Department of Defense, Environmental Laboratory Accreditation Program (US DoD ELAP)** maintains a list of labs for the determination of PFAS in various environmental media other than drinking water on the Defense Environmental Network Information Exchange (DENIX) server:
http://www.denix.osd.mil/edqw/accreditation/accreditedlabs/

Contact Information

Questions regarding PFAS in general, contact:

- **MDHHS General Information**
  (517) 373-3740
- **EGLE Environmental Assistance Center**
  (800) 662-9278

Questions regarding laboratory information, contact:

- **MDHHS Chemistry & Toxicology Division**
  (517) 335-9490
- **EGLE Drinking Water Analysis Laboratory**
  (517) 335-8184

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Eurofins Eaton Analytical
Run Log

Run ID: **268194** Method: **537.1**

Type	Sample Id	Sample Site	Matrix	Instrument ID	Analysis Date	Calibration File
CCL	4497984		OS	DQ	11/26/2019 19:02	112619M537_1a-DQ.mdb
LRB	4491356		RW	DQ	11/26/2019 19:35	112619M537_1a-DQ.mdb
FBL	4491357		RW	DQ	11/26/2019 19:52	112619M537_1a-DQ.mdb
FBM	4491358		RW	DQ	11/26/2019 20:09	112619M537_1a-DQ.mdb
FS	4489520	NEG-19-10-QCFB-01	DW	DQ	11/26/2019 22:07	112619M537_1a-DQ.mdb
CCH	4497985		OS	DQ	11/26/2019 22:24	112619M537_1a-DQ.mdb

QC Summary Report

Sample Type	Analyte	Method	MDA95	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCL	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		1.8377	2.0	ng/L	92	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		1.8127	2.0	ng/L	91	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	IS-NMeFOSAA-d3	537.1	N/A	---		171975	171975	ng/L	100	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	IS-PFOA-13C2	537.1	N/A	---		78340	78339.9	ng/L	100	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	IS-PFOS-13C4	537.1	N/A	---		144734	144734	ng/L	100	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	SS-NEtFOSAA-d5	537.1	N/A	---		159.4500	160	ng/L	100	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	SS-PFDA-13C2	537.1	N/A	---		40.7758	40.0	ng/L	102	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	SS-PFHxA-13C2	537.1	N/A	---		40.5601	40.0	ng/L	101	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		1.7666	2.0	ng/L	88	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		1.8542	2.0	ng/L	93	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		1.8021	2.0	ng/L	90	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorononanoic acid (PFNA)	537.1	2.0	---		1.7384	2.0	ng/L	87	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		1.7605	2.0	ng/L	88	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		1.7591	2.0	ng/L	88	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		1.7088	2.0	ng/L	85	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		1.8167	2.0	ng/L	91	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		1.8266	2.0	ng/L	91	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		2.2881	2.0	ng/L	114	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		1.8895	2.0	ng/L	94	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	HFPO-DA/GenX	537.1	2.0	---		1.4881	2.0	ng/L	74	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	ADONA	537.1	2.0	---		1.7831	2.0	ng/L	89	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		1.8141	2.0	ng/L	91	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		1.7995	2.0	ng/L	90	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		1.7888	2.0	ng/L	89	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
CCL	SS-HFPO-DA-13C3	537.1	N/A	---		39.4292	40.0	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 19:02	4497984
LRB	Perfluorooctanoic acid (PFOA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	IS-NMeFOSAA-d3	537.1	N/A	---		175126	171975	ng/L	102	50 - 150	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	IS-PFOA-13C2	537.1	N/A	---		80231	78339.9	ng/L	102	50 - 150	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	IS-PFOS-13C4	537.1	N/A	---		147328	144734	ng/L	102	50 - 150	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	SS-NEtFOSAA-d5	537.1	N/A	---		133.4180	160	ng/L	94	70 - 130	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	SS-PFDA-13C2	537.1	N/A	---		35.2272	40.0	ng/L	99	70 - 130	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	SS-PFHxA-13C2	537.1	N/A	---		35.2505	40.0	ng/L	99	70 - 130	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorononanoic acid (PFNA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorodecanoic acid (PFDA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
LRB	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	HFPO-DA/GenX	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	ADONA	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	9Cl-PF3ONS/F-53B Major	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
LRB	SS-HFPO-DA-13C3	537.1	N/A	---		35.5021	40.0	ng/L	100	70 - 130	---	---	0.89	11/20/2019 07:35	11/26/2019 19:35	4491356
FBL	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		2.0087	2.0	ng/L	100	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		1.9317	2.0	ng/L	97	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	IS-NMeFOSAA-d3	537.1	N/A	---		178631	171975	ng/L	104	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	IS-PFOA-13C2	537.1	N/A	---		81066	78339.9	ng/L	103	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	IS-PFOS-13C4	537.1	N/A	---		150306	144734	ng/L	104	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	SS-NEtFOSAA-d5	537.1	N/A	---		148.4440	160	ng/L	93	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	SS-PFDA-13C2	537.1	N/A	---		38.9395	40.0	ng/L	97	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	SS-PFHxA-13C2	537.1	N/A	---		39.7182	40.0	ng/L	99	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		1.7757	2.0	ng/L	89	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		1.9118	2.0	ng/L	96	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		1.7508	2.0	ng/L	88	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorononanoic acid (PFNA)	537.1	2.0	---		2.5274	2.0	ng/L	126	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		1.8125	2.0	ng/L	91	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		1.8496	2.0	ng/L	92	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		1.8878	2.0	ng/L	94	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		1.7047	2.0	ng/L	85	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		1.7695	2.0	ng/L	88	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		1.9295	2.0	ng/L	96	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		1.7069	2.0	ng/L	85	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	HFPO-DA/GenX	537.1	2.0	---		1.2733	2.0	ng/L	64	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	ADONA	537.1	2.0	---		1.8572	2.0	ng/L	93	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		1.8404	2.0	ng/L	92	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		1.7258	2.0	ng/L	86	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		1.6558	2.0	ng/L	83	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBL	SS-HFPO-DA-13C3	537.1	N/A	---		39.4574	40.0	ng/L	99	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 19:52	4491357
FBM	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		95.9040	100	ng/L	96	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		95.5472	100	ng/L	96	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	IS-NMeFOSAA-d3	537.1	N/A	---		178915	171975	ng/L	104	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	IS-PFOA-13C2	537.1	N/A	---		80337	78339.9	ng/L	103	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	IS-PFOS-13C4	537.1	N/A	---		146989	144734	ng/L	102	50 - 150	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	SS-NEtFOSAA-d5	537.1	N/A	---		139.4450	160	ng/L	87	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FBM	SS-PFDA-13C2	537.1	N/A	---		38.2057	40.0	ng/L	96	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	SS-PFHxA-13C2	537.1	N/A	---		36.9353	40.0	ng/L	92	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		97.2069	100	ng/L	97	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		93.3082	100	ng/L	93	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		98.1702	100	ng/L	98	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorononanoic acid (PFNA)	537.1	2.0	---		99.2230	100	ng/L	99	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		98.1271	100	ng/L	98	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		93.1097	100	ng/L	93	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		93.9754	100	ng/L	94	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		88.3801	100	ng/L	88	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		92.2290	100	ng/L	92	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		88.4148	100	ng/L	88	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		90.4889	100	ng/L	90	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	HFPO-DA/GenX	537.1	2.0	---		84.5868	100	ng/L	85	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	ADONA	537.1	2.0	---		88.3706	100	ng/L	88	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		96.7910	100	ng/L	97	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		92.5885	100	ng/L	93	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		87.4316	100	ng/L	87	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FBM	SS-HFPO-DA-13C3	537.1	N/A	---		32.4512	40.0	ng/L	81	70 - 130	---	---	1.0	11/20/2019 07:35	11/26/2019 20:09	4491358
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-QCFB-01		156898	171975	ng/L	91	50 - 150	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-QCFB-01		75564	78339.9	ng/L	96	50 - 150	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-QCFB-01		133854	144734	ng/L	92	50 - 150	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-QCFB-01		111.7660	160	ng/L	85	70 - 130	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-QCFB-01		28.7910	40.0	ng/L	88	70 - 130	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-QCFB-01		30.9816	40.0	ng/L	94	70 - 130	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	ADONA	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520

QC Summary Report (cont.)															
Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-QCFB-01	<	2.0		ng/L	---	---	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-QCFB-01		29.6212	40.0	ng/L	90	70 - 130	---	---	0.82	11/20/2019 07:35	11/26/2019 22:07	4489520
CCH	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		196.8860	200	ng/L	98	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		198.1900	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	IS-NMeFOSAA-d3	537.1	N/A	---		166462	166462	ng/L	100	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	IS-PFOA-13C2	537.1	N/A	---		76064	76063.5	ng/L	100	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	IS-PFOS-13C4	537.1	N/A	---		137627	137627	ng/L	100	50 - 150	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	SS-NEtFOSAA-d5	537.1	N/A	---		159.2320	160	ng/L	100	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	SS-PFDA-13C2	537.1	N/A	---		39.7176	40.0	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	SS-PFHxA-13C2	537.1	N/A	---		39.7816	40.0	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		197.2990	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		193.9030	200	ng/L	97	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		199.0330	200	ng/L	100	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorononanoic acid (PFNA)	537.1	2.0	---		199.8330	200	ng/L	100	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		198.9770	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		197.8370	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		198.0180	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		197.2260	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		195.1260	200	ng/L	98	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		202.2530	200	ng/L	101	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		199.0260	200	ng/L	100	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	HFPO-DA/GenX	537.1	2.0	---		194.1070	200	ng/L	97	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	ADONA	537.1	2.0	---		194.0170	200	ng/L	97	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		197.9500	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		200.6100	200	ng/L	100	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		198.8600	200	ng/L	99	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985
CCH	SS-HFPO-DA-13C3	537.1	N/A	---		42.0821	40.0	ng/L	105	70 - 130	---	---	1.0	11/25/2019 12:47	11/26/2019 22:24	4497985

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Run Log

Run ID: **268311** Method: **537.1**

Type	Sample Id	Sample Site	Matrix	Instrument ID	Analysis Date	Calibration File
CCL	4495583		OS	FL	11/25/2019 05:25	112519M537_1a-FL.mdb
LRB	4494376		RW	FL	11/25/2019 05:59	112519M537_1a-FL.mdb
FBL	4494377		RW	FL	11/25/2019 06:16	112519M537_1a-FL.mdb
FBM	4494378		RW	FL	11/25/2019 06:33	112519M537_1a-FL.mdb
FS	4489507	NEG-19-10-DW 4303 SecludedLkDr	DW	FL	11/25/2019 06:50	112519M537_1a-FL.mdb
LFSML	4489508	NEG-19-10-DW 4303 SecludedLkDr	DW	FL	11/25/2019 07:07	112519M537_1a-FL.mdb
LFSMDL	4489509	NEG-19-10-DW 4303 SecludedLkDr	DW	FL	11/25/2019 07:24	112519M537_1a-FL.mdb
FS	4489510	NEG-19-10-DW 4361 7 Mile Rd I	DW	FL	11/25/2019 07:41	112519M537_1a-FL.mdb
FS	4489511	NEG-19-10-DW 4361 7 Mile Rd D	DW	FL	11/25/2019 07:58	112519M537_1a-FL.mdb
FS	4489512	NEG-19-10-DW 4253 7 Mile Rd I	DW	FL	11/25/2019 08:15	112519M537_1a-FL.mdb
FS	4489513	NEG-19-10-DW 4211 7 Mile Rd I	DW	FL	11/25/2019 08:32	112519M537_1a-FL.mdb
FS	4489514	NEG-19-10-DW 6237 Northland Dr	DW	FL	11/25/2019 08:49	112519M537_1a-FL.mdb
FS	4489515	NEG-19-10-DW 6410 Northland Dr	DW	FL	11/25/2019 09:06	112519M537_1a-FL.mdb
FS	4489516	NEG-19-10-DW 6494 Thimbleweed	DW	FL	11/25/2019 09:23	112519M537_1a-FL.mdb
FS	4489517	NEG-19-10-DW 6516 Thimbleweed	DW	FL	11/25/2019 09:40	112519M537_1a-FL.mdb
FS	4489518	NEG-19-10-DW 6522 Thimbleweed	DW	FL	11/25/2019 09:57	112519M537_1a-FL.mdb
CCM	4495584		OS	FL	11/25/2019 10:14	112519M537_1a-FL.mdb
FS	4489519	NEG-19-10-DW 6532 Thimbleweed	DW	FL	11/25/2019 10:31	112519M537_1a-FL.mdb
FS	4489521	NEG-19-10-DW 6486 Thimbleweed	DW	FL	11/25/2019 10:48	112519M537_1a-FL.mdb
FS	4489522	NEG-19-10-DW 4444 SecludedLkDr	DW	FL	11/25/2019 11:05	112519M537_1a-FL.mdb
CCH	4495585		OS	FL	11/25/2019 15:38	112519M537_1a-FL.mdb

QC Summary Report

Sample Type	Analyte	Method	MDA95	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCL	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		1.9453	2.0	ng/L	97	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		2.0071	2.0	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	IS-NMeFOSAA-d3	537.1	N/A	---		364371	364371	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	IS-PFOA-13C2	537.1	N/A	---		763050	763050	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	IS-PFOS-13C4	537.1	N/A	---		382912	382912	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	SS-NEtFOSAA-d5	537.1	N/A	---		158.7920	160	ng/L	99	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	SS-PFDA-13C2	537.1	N/A	---		38.9796	40.0	ng/L	97	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	SS-PFHxA-13C2	537.1	N/A	---		38.7780	40.0	ng/L	97	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		1.9214	2.0	ng/L	96	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		1.8405	2.0	ng/L	92	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		1.9340	2.0	ng/L	97	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorononanoic acid (PFNA)	537.1	2.0	---		1.9285	2.0	ng/L	96	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		1.9350	2.0	ng/L	97	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		1.8957	2.0	ng/L	95	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		1.9459	2.0	ng/L	97	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		2.0008	2.0	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		1.8827	2.0	ng/L	94	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		2.1116	2.0	ng/L	106	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		2.1504	2.0	ng/L	108	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	HFPO-DA/GenX	537.1	2.0	---		1.8588	2.0	ng/L	93	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	ADONA	537.1	2.0	---		1.8578	2.0	ng/L	93	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		2.0886	2.0	ng/L	104	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		2.1172	2.0	ng/L	106	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		1.9751	2.0	ng/L	99	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
CCL	SS-HFPO-DA-13C3	537.1	N/A	---		38.8083	40.0	ng/L	97	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 05:25	4495583
LRB	Perfluorooctanoic acid (PFOA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	IS-NMeFOSAA-d3	537.1	N/A	---		369615	364371	ng/L	101	50 - 150	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	IS-PFOA-13C2	537.1	N/A	---		780221	763050	ng/L	102	50 - 150	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	IS-PFOS-13C4	537.1	N/A	---		393574	382912	ng/L	103	50 - 150	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	SS-NEtFOSAA-d5	537.1	N/A	---		135.8120	160	ng/L	93	70 - 130	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	SS-PFDA-13C2	537.1	N/A	---		35.6926	40.0	ng/L	98	70 - 130	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	SS-PFHxA-13C2	537.1	N/A	---		35.7185	40.0	ng/L	98	70 - 130	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorononanoic acid (PFNA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorodecanoic acid (PFDA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
LRB	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	HFPO-DA/GenX	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	ADONA	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	9Cl-PF3ONS/F-53B Major	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---	<	2.0		ng/L	---	---	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
LRB	SS-HFPO-DA-13C3	537.1	N/A	---		35.1308	40.0	ng/L	97	70 - 130	---	---	0.91	11/22/2019 08:02	11/25/2019 05:59	4494376
FBL	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		2.0081	2.0	ng/L	100	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		2.0026	2.0	ng/L	100	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	IS-NMeFOSAA-d3	537.1	N/A	---		392593	364371	ng/L	108	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	IS-PFOA-13C2	537.1	N/A	---		815393	763050	ng/L	107	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	IS-PFOS-13C4	537.1	N/A	---		412519	382912	ng/L	108	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	SS-NEtFOSAA-d5	537.1	N/A	---		144.2930	160	ng/L	90	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	SS-PFDA-13C2	537.1	N/A	---		38.0437	40.0	ng/L	95	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	SS-PFHxA-13C2	537.1	N/A	---		39.0899	40.0	ng/L	98	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		1.9666	2.0	ng/L	98	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		1.8770	2.0	ng/L	94	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		1.9729	2.0	ng/L	99	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorononanoic acid (PFNA)	537.1	2.0	---		1.9581	2.0	ng/L	98	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		1.8806	2.0	ng/L	94	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		1.9742	2.0	ng/L	99	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		1.8079	2.0	ng/L	90	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		1.7190	2.0	ng/L	86	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		1.8274	2.0	ng/L	91	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		1.9424	2.0	ng/L	97	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		1.9016	2.0	ng/L	95	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	HFPO-DA/GenX	537.1	2.0	---		1.9159	2.0	ng/L	96	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	ADONA	537.1	2.0	---		1.9342	2.0	ng/L	97	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		1.8996	2.0	ng/L	95	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		1.8721	2.0	ng/L	94	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		1.7657	2.0	ng/L	88	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBL	SS-HFPO-DA-13C3	537.1	N/A	---		38.8349	40.0	ng/L	97	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:16	4494377
FBM	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		97.9356	100	ng/L	98	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		98.1620	100	ng/L	98	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	IS-NMeFOSAA-d3	537.1	N/A	---		395365	364371	ng/L	109	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	IS-PFOA-13C2	537.1	N/A	---		817900	763050	ng/L	107	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	IS-PFOS-13C4	537.1	N/A	---		415884	382912	ng/L	109	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	SS-NEtFOSAA-d5	537.1	N/A	---		141.1200	160	ng/L	88	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FBM	SS-PFDA-13C2	537.1	N/A	---		37.4522	40.0	ng/L	94	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	SS-PFHxA-13C2	537.1	N/A	---		37.9003	40.0	ng/L	95	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		100.9710	100	ng/L	101	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		96.1325	100	ng/L	96	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		101.1070	100	ng/L	101	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorononanoic acid (PFNA)	537.1	2.0	---		97.4655	100	ng/L	97	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		93.5598	100	ng/L	94	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		95.0492	100	ng/L	95	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		89.9796	100	ng/L	90	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		87.1797	100	ng/L	87	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		92.2163	100	ng/L	92	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		91.4806	100	ng/L	91	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		93.1718	100	ng/L	93	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	HFPO-DA/GenX	537.1	2.0	---		92.5701	100	ng/L	93	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	ADONA	537.1	2.0	---		94.7361	100	ng/L	95	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		97.4585	100	ng/L	97	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		91.7077	100	ng/L	92	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		88.8906	100	ng/L	89	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FBM	SS-HFPO-DA-13C3	537.1	N/A	---		36.2936	40.0	ng/L	91	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 06:33	4494378
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		358158	364371	ng/L	98	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		751984	763050	ng/L	99	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		377263	382912	ng/L	99	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		112.7280	160	ng/L	85	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		30.7545	40.0	ng/L	93	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		31.9835	40.0	ng/L	96	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	ADONA	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		32.2844	40.0	ng/L	97	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 06:50	4489507
LFSML	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		2.3975	2.0	ng/L	120	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9912	2.0	ng/L	100	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		367643	364371	ng/L	101	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		768017	763050	ng/L	101	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		384917	382912	ng/L	101	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		134.3020	160	ng/L	84	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		36.8325	40.0	ng/L	92	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		38.3295	40.0	ng/L	96	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9875	2.0	ng/L	99	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8793	2.0	ng/L	94	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9687	2.0	ng/L	98	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9189	2.0	ng/L	96	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8374	2.0	ng/L	92	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9246	2.0	ng/L	96	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8030	2.0	ng/L	90	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.7290	2.0	ng/L	86	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8375	2.0	ng/L	92	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8369	2.0	ng/L	92	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8543	2.0	ng/L	93	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8533	2.0	ng/L	93	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	ADONA	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8949	2.0	ng/L	95	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8903	2.0	ng/L	95	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8736	2.0	ng/L	94	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.7785	2.0	ng/L	89	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSML	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		36.4849	40.0	ng/L	91	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:07	4489508
LFSMDL	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		2.3817	2.0	ng/L	119	50 - 150	0.7	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		2.0084	2.0	ng/L	100	50 - 150	0.9	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		360351	364371	ng/L	99	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		759374	763050	ng/L	100	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		376935	382912	ng/L	98	50 - 150	---	---	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		134.7660	160	ng/L	84	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		36.9155	40.0	ng/L	92	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		38.2630	40.0	ng/L	96	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		2.0086	2.0	ng/L	100	50 - 150	1.1	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8553	2.0	ng/L	93	50 - 150	1.3	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		2.0966	2.0	ng/L	105	50 - 150	6.3	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8957	2.0	ng/L	95	50 - 150	1.2	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.7975	2.0	ng/L	90	50 - 150	2.2	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
LFSMDL	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9320	2.0	ng/L	97	50 - 150	0.4	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.7507	2.0	ng/L	88	50 - 150	2.9	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.6720	2.0	ng/L	84	50 - 150	3.3	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.7831	2.0	ng/L	89	50 - 150	3.0	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9890	2.0	ng/L	99	50 - 150	8.0	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8298	2.0	ng/L	91	50 - 150	1.3	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8253	2.0	ng/L	91	50 - 150	1.5	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	ADONA	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.9046	2.0	ng/L	95	50 - 150	0.5	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8863	2.0	ng/L	94	50 - 150	0.2	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.8171	2.0	ng/L	91	50 - 150	3.1	30	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4303 SecludedLkDr		1.7037	2.0	ng/L	85	50 - 150	4.3	50	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
LFSMDL	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4303 SecludedLkDr		37.2652	40.0	ng/L	93	70 - 130	---	---	1.0	11/22/2019 08:02	11/25/2019 07:24	4489509
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I		3.3		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I		8.6		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd I		379001	364371	ng/L	104	50 - 150	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd I		796545	763050	ng/L	104	50 - 150	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd I		399266	382912	ng/L	104	50 - 150	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd I		123.3580	160	ng/L	88	70 - 130	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd I		32.8861	40.0	ng/L	93	70 - 130	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd I		34.0244	40.0	ng/L	97	70 - 130	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I		16		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I		13		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	ADONA	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd I		33.1245	40.0	ng/L	94	70 - 130	---	---	0.88	11/22/2019 08:02	11/25/2019 07:41	4489510
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D		3.2		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D		8.3		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd D		369651	364371	ng/L	101	50 - 150	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd D		776092	763050	ng/L	102	50 - 150	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd D		389973	382912	ng/L	102	50 - 150	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd D		120.7950	160	ng/L	89	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd D		31.8787	40.0	ng/L	94	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd D		33.0653	40.0	ng/L	97	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D		16		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D		12		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	ADONA	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4361 7 Mile Rd D	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4361 7 Mile Rd D		31.0435	40.0	ng/L	91	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 07:58	4489511
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4253 7 Mile Rd I		381307	364371	ng/L	105	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4253 7 Mile Rd I		804414	763050	ng/L	105	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4253 7 Mile Rd I		399864	382912	ng/L	104	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4253 7 Mile Rd I		108.5790	160	ng/L	82	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4253 7 Mile Rd I		31.1185	40.0	ng/L	94	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4253 7 Mile Rd I		31.9590	40.0	ng/L	96	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I		7.4		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	ADONA	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4253 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4253 7 Mile Rd I		31.7117	40.0	ng/L	96	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 08:15	4489512
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4211 7 Mile Rd I		377421	364371	ng/L	104	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4211 7 Mile Rd I		787361	763050	ng/L	103	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4211 7 Mile Rd I		390069	382912	ng/L	102	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4211 7 Mile Rd I		109.8420	160	ng/L	82	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4211 7 Mile Rd I		29.9962	40.0	ng/L	89	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4211 7 Mile Rd I		31.2516	40.0	ng/L	93	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	ADONA	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4211 7 Mile Rd I	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4211 7 Mile Rd I		30.6626	40.0	ng/L	91	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:32	4489513
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr		3.2		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 6237 Northland Dr		387135	364371	ng/L	106	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 6237 Northland Dr		800202	763050	ng/L	105	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 6237 Northland Dr		402196	382912	ng/L	105	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 6237 Northland Dr		113.9550	160	ng/L	85	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 6237 Northland Dr		31.0352	40.0	ng/L	92	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 6237 Northland Dr		32.1087	40.0	ng/L	96	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr		3.6		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	ADONA	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 6237 Northland Dr	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 6237 Northland Dr		31.4978	40.0	ng/L	94	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 08:49	4489514
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr		6.4		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr		10		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 6410 Northland Dr		392859	364371	ng/L	108	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 6410 Northland Dr		817660	763050	ng/L	107	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 6410 Northland Dr		410567	382912	ng/L	107	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 6410 Northland Dr		117.2810	160	ng/L	89	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 6410 Northland Dr		30.6379	40.0	ng/L	93	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 6410 Northland Dr		30.8820	40.0	ng/L	94	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr		5.7		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr		2.9		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr		2.3		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	ADONA	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 6410 Northland Dr	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 6410 Northland Dr		30.8456	40.0	ng/L	94	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:06	4489515
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 6494 Thimbleweed		396270	364371	ng/L	109	50 - 150	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 6494 Thimbleweed		820755	763050	ng/L	108	50 - 150	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 6494 Thimbleweed		406686	382912	ng/L	106	50 - 150	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 6494 Thimbleweed		116.3430	160	ng/L	90	70 - 130	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 6494 Thimbleweed		29.7708	40.0	ng/L	92	70 - 130	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 6494 Thimbleweed		30.5918	40.0	ng/L	94	70 - 130	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	ADONA	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 6494 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 6494 Thimbleweed		29.0927	40.0	ng/L	90	70 - 130	---	---	0.81	11/22/2019 08:02	11/25/2019 09:23	4489516
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 6516 Thimbleweed		334742	364371	ng/L	92	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 6516 Thimbleweed		691863	763050	ng/L	91	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 6516 Thimbleweed		346531	382912	ng/L	90	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 6516 Thimbleweed		137.5450	160	ng/L	105	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 6516 Thimbleweed		35.3214	40.0	ng/L	108	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 6516 Thimbleweed		35.4943	40.0	ng/L	108	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed		2.9		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed		2.6		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	ADONA	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 6516 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 6516 Thimbleweed		34.4798	40.0	ng/L	105	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:40	4489517
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 6522 Thimbleweed		367140	364371	ng/L	101	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 6522 Thimbleweed		752365	763050	ng/L	99	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 6522 Thimbleweed		374153	382912	ng/L	98	50 - 150	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 6522 Thimbleweed		116.9960	160	ng/L	89	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 6522 Thimbleweed		30.6853	40.0	ng/L	94	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 6522 Thimbleweed		31.4812	40.0	ng/L	96	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed		2.7		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	ADONA	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 6522 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 6522 Thimbleweed		31.0420	40.0	ng/L	95	70 - 130	---	---	0.82	11/22/2019 08:02	11/25/2019 09:57	4489518
CCM	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		99.6670	100	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		99.9450	100	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	IS-NMeFOSAA-d3	537.1	N/A	---		392751	392751	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	IS-PFOA-13C2	537.1	N/A	---		792881	792881	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	IS-PFOS-13C4	537.1	N/A	---		398715	398715	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	SS-NEtFOSAA-d5	537.1	N/A	---		162.9560	160	ng/L	102	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	SS-PFDA-13C2	537.1	N/A	---		40.3211	40.0	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	SS-PFHxA-13C2	537.1	N/A	---		39.4610	40.0	ng/L	99	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		99.8306	100	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
CCM	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		96.5546	100	ng/L	97	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		103.3830	100	ng/L	103	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorononanoic acid (PFNA)	537.1	2.0	---		97.7523	100	ng/L	98	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		96.5330	100	ng/L	97	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		95.2769	100	ng/L	95	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		99.8032	100	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		96.8772	100	ng/L	97	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		99.5191	100	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		101.9110	100	ng/L	102	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		100.3200	100	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	HFPO-DA/GenX	537.1	2.0	---		94.6050	100	ng/L	95	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	ADONA	537.1	2.0	---		98.6249	100	ng/L	99	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		101.6970	100	ng/L	102	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		103.0410	100	ng/L	103	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		99.4171	100	ng/L	99	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
CCM	SS-HFPO-DA-13C3	537.1	N/A	---		39.8044	40.0	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 10:14	4495584
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 6532 Thimbleweed		373021	392751	ng/L	95	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 6532 Thimbleweed		766473	792881	ng/L	97	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 6532 Thimbleweed		380506	398715	ng/L	95	50 - 150	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 6532 Thimbleweed		117.9420	160	ng/L	88	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 6532 Thimbleweed		31.2021	40.0	ng/L	93	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 6532 Thimbleweed		31.5628	40.0	ng/L	94	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed		2.8		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed		2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	ADONA	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 6532 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 6532 Thimbleweed		30.6414	40.0	ng/L	91	70 - 130	---	---	0.84	11/22/2019 08:02	11/25/2019 10:31	4489519

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 6486 Thimbleweed		395930	392751	ng/L	101	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 6486 Thimbleweed		809176	792881	ng/L	102	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 6486 Thimbleweed		404597	398715	ng/L	101	50 - 150	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 6486 Thimbleweed		112.3940	160	ng/L	85	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 6486 Thimbleweed		30.4775	40.0	ng/L	92	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 6486 Thimbleweed		30.9382	40.0	ng/L	93	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	ADONA	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 6486 Thimbleweed	<	2.0		ng/L	---	---	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 6486 Thimbleweed		29.9689	40.0	ng/L	90	70 - 130	---	---	0.83	11/22/2019 08:02	11/25/2019 10:48	4489521
FS	Perfluorooctanoic acid (PFOA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	IS-NMeFOSAA-d3	537.1	N/A	NEG-19-10-DW 4444 SecludedLkDr		367014	392751	ng/L	93	50 - 150	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	IS-PFOA-13C2	537.1	N/A	NEG-19-10-DW 4444 SecludedLkDr		754127	792881	ng/L	95	50 - 150	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	IS-PFOS-13C4	537.1	N/A	NEG-19-10-DW 4444 SecludedLkDr		378146	398715	ng/L	95	50 - 150	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	SS-NEtFOSAA-d5	537.1	N/A	NEG-19-10-DW 4444 SecludedLkDr		117.0700	160	ng/L	86	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	SS-PFDA-13C2	537.1	N/A	NEG-19-10-DW 4444 SecludedLkDr		32.0236	40.0	ng/L	94	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	SS-PFHxA-13C2	537.1	N/A	NEG-19-10-DW 4444 SecludedLkDr		33.1936	40.0	ng/L	98	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorononanoic acid (PFNA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorodecanoic acid (PFDA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorohexanoic acid (PFHxA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorododecanoic acid (PFDoA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522

QC Summary Report (cont.)

Sample Type	Analyte	Method	MRL	Client ID	Result Flag	Amount	Target	Units	% Recovery	Recovery Limits	RPD	RPD Limit	Dil Factor	Extracted	Analyzed	EEA ID #
FS	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	HFPO-DA/GenX	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	ADONA	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	9Cl-PF3ONS/F-53B Major	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	NEG-19-10-DW 4444 SecludedLkDr	<	2.0		ng/L	---	---	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
FS	SS-HFPO-DA-13C3	537.1	N/A	NEG-19-10-DW 4444 SecludedLkDr		32.1645	40.0	ng/L	95	70 - 130	---	---	0.85	11/22/2019 08:02	11/25/2019 11:05	4489522
CCH	Perfluorooctanoic acid (PFOA)	537.1	2.0	---		203.5820	200	ng/L	102	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorooctanesulfonic acid (PFOS)	537.1	2.0	---		204.7960	200	ng/L	102	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	IS-NMeFOSAA-d3	537.1	N/A	---		350319	350319	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	IS-PFOA-13C2	537.1	N/A	---		704387	704387	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	IS-PFOS-13C4	537.1	N/A	---		360768	360768	ng/L	100	50 - 150	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	SS-NEtFOSAA-d5	537.1	N/A	---		156.7030	160	ng/L	98	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	SS-PFDA-13C2	537.1	N/A	---		39.8789	40.0	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	SS-PFHxA-13C2	537.1	N/A	---		38.9901	40.0	ng/L	97	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorobutanesulfonic acid (PFBS)	537.1	2.0	---		203.4370	200	ng/L	102	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluoroheptanoic acid (PFHpA)	537.1	2.0	---		201.1320	200	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorohexanesulfonic acid (PFHxS)	537.1	2.0	---		206.1370	200	ng/L	103	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorononanoic acid (PFNA)	537.1	2.0	---		199.1330	200	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorodecanoic acid (PFDA)	537.1	2.0	---		200.3350	200	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorohexanoic acid (PFHxA)	537.1	2.0	---		198.6990	200	ng/L	99	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorododecanoic acid (PFDoA)	537.1	2.0	---		202.6020	200	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorotridecanoic acid (PFTrDA)	537.1	2.0	---		199.5150	200	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluoroundecanoic acid (PFUnA)	537.1	2.0	---		202.6610	200	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	N-ethyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		203.5300	200	ng/L	102	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	N-methyl Perfluorooctanesulfonamidoacetic acid	537.1	2.0	---		202.8820	200	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	HFPO-DA/GenX	537.1	2.0	---		201.9790	200	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	ADONA	537.1	2.0	---		201.1370	200	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	9Cl-PF3ONS/F-53B Major	537.1	2.0	---		206.9400	200	ng/L	103	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	11Cl-PF3OUdS/F-53B Minor	537.1	2.0	---		206.8820	200	ng/L	103	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	Perfluorotetradecanoic acid (PFTeDA)	537.1	2.0	---		201.8870	200	ng/L	101	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585
CCH	SS-HFPO-DA-13C3	537.1	N/A	---		40.0097	40.0	ng/L	100	70 - 130	---	---	1.0	11/21/2019 14:04	11/25/2019 15:38	4495585