



February 23, 2022

Stan Jones
Port of Portland
PO Box 3529
Portland, OR 97208

Re: PDX PFAS 2021 Stormwater Monitoring Data Report
Portland International Airport
Portland, Oregon
2670-00

Dear Mr. Jones:

INTRODUCTION

This *2021 Stormwater Monitoring Data Report* documents the collection and analysis of stormwater and surface water samples associated with Portland International Airport (Site, PDX; Figures 1 and 2). As identified in the Preliminary Assessment (Apex, 2017), multiple areas of interest across PDX were identified as having potential historical use of aqueous film-forming foam (AFFF) and possible release to the ground surface. The Oregon Department of Environmental Quality (DEQ) requested assessment of PDX stormwater to determine if historical use of AFFF that may have contained per- and polyfluorinated alkyl substances (PFAS) has affected stormwater quality.

Based on the PFAS concentrations detected on-site in the Original and Former Fire Training Facilities investigation in the northwest portion of PDX (in sub-basin 1N of Basin 1), as well as correspondence with the DEQ, stormwater at the Site is a potential pathway for PFAS impacts to reach sensitive receptors and has not been fully characterized to date.

Figure 2 depicts the stormwater drainage basins on-site. Based on review of the Site stormwater drainage system and discussions with Oregon DEQ, a total of nine stormwater monitoring locations were selected to conduct reconnaissance level sampling for PFAS. In addition, Apex concurrently sampled historical stormwater/surface water sampling locations SW-2, SW-3, OF-1N-NW, and Ditch B, which are located downgradient of the former fire training facilities within Drainage Basin 1N. This monitoring program is generally the same as the program conducted in 2020 at PDX, documented in the November 18, 2020 *PDX PFAS Stormwater Monitoring Data Report* prepared by Apex. Methods and procedures followed the February 7, 2020 *Work Plan – PDX PFAS Stormwater Monitoring* prepared by Apex. At the request of DEQ, the work plan was supplemented to include total/dissolved analysis of PFAS at three locations (OF-1N-NW, SW-2, and Basin 6) in an email to DEQ dated September 24, 2021, and DEQ approved the method and sampling locations in an email dated September 25, 2021.

Purpose. The purpose of the 2021 stormwater monitoring was to assess PFAS concentrations in stormwater discharging from PDX during dry and wet seasons (September and December 2021).

Scope of Work. The scope of work included the following tasks:

- Collection of 13 stormwater/surface water samples at PDX outfalls and ditches for analysis of PFAS during dry weather conditions (September 2021) and wet weather conditions (December 2021; total of 26 samples);

- Collection of an additional two samples at locations 1E and 1S based on a request from the Port during the dry weather sampling event;
- Collection of three additional samples for a total vs. dissolved PFAS analysis during the wet weather sampling event; and,
- Preparation of this Stormwater Monitoring Data Report.

These activities are discussed in further detail in the following sections.

BACKGROUND

This section presents a brief description of the Site and its history. Information included in this section was obtained from previously completed site investigations and related work conducted within the vicinity of the Site.

Site Location and Description. The Site includes the entire PDX property and is located in the northeastern portion of the City of Portland, adjacent to the Columbia River (shown on Figures 1 and 2). Portions of PDX have been actively used for aviation firefighting drills since 1963. Fire training exercises utilized water and retardant firefighting foams (i.e. AFFF) to extinguish training fires and during training activities at the Site. PDX and its fire department are regulated under the Federal Aviation Administration (FAA) and the National Fire Protection Association (NFPA) regulations and guidance, which specify the AFFF type, testing, use, and training that is required for use of AFFF on commercial aviation facilities. The PDX fire department has followed these regulations and standards of practice, which has resulted in the use and storage of PFAS-containing AFFF since their introduction in the late 1960s.

Site History. Several historical investigations and remedial actions have been conducted at the Site. PFAS were initially detected in groundwater in April 2017, in the northwest portion of the Site, near the former and current fire training facilities, at concentrations above the U.S. Environmental Protection Agency (EPA) Health Advisory level (70 nanograms per liter [ng/L] for combined perfluorooctanoic acid [PFOA] and perfluorooctane sulfonate [PFOS]). Since that time, multiple rounds of soil, groundwater, surface water, stormwater, and sediment sampling have been conducted in the northwest portion of the Site to determine the concentrations of PFAS and delineate the detected groundwater plume. Groundwater investigation activities are ongoing on the PDX property at locations including the Fire Training Facilities, former fire stations, Oregon Air National Guard (ORANG) leasehold, and other areas. A site-wide stormwater and surface water sampling event was completed in 2020.

Site Stormwater. Figure 2 shows the current stormwater drainage basins. Drainage from PDX is discharged to the Columbia Slough from 12 drainage basins at a total of 18 discharge points. In some cases, the discharge point to the Slough is mixed with drainage from non-Port properties (e.g., Basins 1, 2, 7, 8, and 9). Additionally, in Basins 1, 2, and 7, Port outfalls discharge to open channels prior to discharging to the Slough. The following describes the current drainage basins and outfalls:

- **Basin 1** – Basin 1 is the western end of PDX and includes runways, taxiways, ramps, fire station, fire training area, jet fuel farm, and the deicing system storage tanks and treatment area. Basin 1 has sub-basins 1N, 1S, and 1E. Sub-basin 1N includes portions of Runway 10R/28L, Taxiways D, H, and K, Perimeter Road, and undeveloped areas. Sub-basin 1N consists of a total area of approximately 648 acres, approximately 130 acres of which are impervious. Sub-basin 1S includes portions of the Northwest Ramp, portions of Taxiways B, C, E, G, M, T, and portions of Runway 3/21. Sub-basin 1S consists of a total area of approximately 160 acres, approximately 32 acres of which are impervious. Sub-basin 1E consists of a total area of approximately 20 acres, approximately 18 acres of which are impervious. Stormwater on the undeveloped, pervious areas where non-industrial activities occur infiltrates and does not runoff. Stormwater from the remaining areas of Basin 1 discharges to the Elrod Ditch system, then the Columbia Slough via the outfall at Multnomah County Drainage District's (MCDD) Pump Station #2.

- Basin 2 – Basin 2 includes Runway 3/21, taxiways, and ramps. Prior to discharge from PDX facilities, drainage passes through the West Quiescent Pond and a detention pond. Total area is 209 acres; 88 acres are impervious. There is one Port outfall from Basin 2 to an open channel. This open channel is discharged via an MCDD-owned pump to the Columbia Slough.
- Basin 3 – Basin 3 consists primarily of the Boeing Hangar, a ramp, and portions of the Airtrans Center. Total area is 14 acres; 11 acres are impervious. Basin 3 discharges to the Slough via gravity flow through a 30-inch Port-owned pipe.
- Basin 4 – Basin 4 consists of parcel carrier facilities (FedEx, UPS, DHL), air cargo, and aircraft loading areas and ramps that drain to the Central Quiescent Pond prior to discharging to the Slough. Total area is 50 acres; 45 acres are impervious. Basin 4 discharges to the Columbia Slough via gravity flow through a 48-inch Port-owned pipe.
- Basin 5 – Basin 5 contains various industrial buildings, parcel carrier facilities, parking lots, roads (Airtrans Way) and airport ramps that drain directly to the Middle Slough. The Dilute Detention Basin (DDB) is located here, but none of that area is tributary to this basin. Total area is 48 acres; 29 acres are impervious. Basin 5 discharges to the Slough via gravity flow through a 54-inch Port-owned pipe.
- Basin 6 – Roughly half of Basin 6 is occupied by the Oregon Air National Guard (ORANG) facility. The remaining area includes the middle of Runway 10R/28L, several taxiways, and portions of the airport terminals and parking garage. Drainage from ORANG is isolated from the Port operated areas and passes through a detention basin prior to discharge to the Port system. Basin 6 is mostly a piped drainage system, including approximately 2.7 miles of sub-drains, with some open channels in the ORANG area. Drainage from Basin 6 passes through the East Quiescent Basin and the East Detention Pond prior to discharge to the Middle Slough. Total area is 237 acres; 173 acres are impervious. Basin 6 discharges to the Slough via a pump at the East Detention Pond through a 60-inch Port-owned pipe.
- Basin 7 – Basin 7 includes Runway 10L/28R, east portion of Runway 10R/28L main airport terminal, maintenance facilities, support facilities, glycol storage tanks, light rail, parking lots, taxiways, and ramps. The area includes approximately 5.7 miles of sub-drains. Total area is 635 acres; 313 acres are impervious. Basin 7 discharges to McBride Slough via gravity flow through four Port-owned discharge pipes. The majority of the drainage is through a 78-inch pipe. McBride Slough, including drainage from non-Port properties, discharges to the Slough via gravity flow through a Port-owned Colwood pipe.
- Basin 8 – Basin 8 consists of parking lots, roadways (including Marine Drive, which may be deeded by the City or state), car rental facilities, hotels, Airport Way, light rail lines, and various commercial facilities. The area is primarily piped storm drain systems on the north side of Airport Way, with approximately 3.8 miles of sub-drains, and several open drainage channels on the south side of Airport Way. There is significant commercial development in the southeast portion of this drainage area with newer stormwater infiltration and treatment facilities. Non-Port drainage includes discharges from City-owned streets. Total area is 433 acres; 158 acres are impervious. Basin 8 discharges to the Slough via gravity flow through a 48-inch City-owned pipe.
- Basin 9 – Basin 9 consists of long-term parking lots, commercial facilities, Airport Way, and some undeveloped open space. A portion of this drainage comes from I-205 and properties east of I-205 that are not owned/controlled by the Port. Total area is 182 acres; 85 acres are impervious. Basin 9 discharges to the Slough via gravity flow through a 72-inch, MCDD-owned pipe.

Screening Levels and PFAS Regulatory Status. The EPA has established drinking water health advisories for PFOA and PFOS based on the agency's assessment of the latest peer-reviewed science on their potential human health effects. The EPA health advisory level (HAL) is 70 ng/L for the combined concentration of PFOA and PFOS, published in 2016. In December 2019, the EPA issued an interim recommendation screening level for drinking water of 40 ng/L for the individual concentration of PFOA or PFOS.

In September 2021, the Oregon Health Authority (OHA) issued a HAL of 30 ng/L for the individual or combined concentration of PFOS, PFOA, perfluorononanoic acid (PFNA), and perfluorohexane sulfonic acid (PFHxS) in drinking water. The drinking water health advisories are non-regulatory and do not mandate a required action; however, to be conservative, the collected data from the wet and dry season stormwater and surface water sampling events was screened against these health advisories (including historical data dating back to 2017).

There are currently no other applicable DEQ or OHA screening levels for PFAS in groundwater, stormwater, surface water, sediment, or soil. There are no EPA screening levels for PFAS in stormwater or surface water. Without applicable DEQ or OHA screening levels for stormwater and surface water, Apex reviewed the potential Site receptors and exposure pathways and surveyed screening levels that have been developed by the EPA, other U.S. states, and countries globally. The collected stormwater and surface water data herein was then also screened against risk-based screening levels developed in Florida (freshwater screening level for human health) and Michigan (water quality value for non-drinking surface water) for PFOS and PFOA (provided below).

Risk-Based Screening Level	PFOS	PFOA
Florida Freshwater Screening Level for Human Health	10 ng/L	500 ng/L
Michigan Water Quality Value for Non-Drinking Surface Water	12 ng/L	12,000 ng/L

INVESTIGATION ACTIVITIES

The scope of work included stormwater and surface water sampling and analysis for the Port basins conducted during wet and dry weather conditions in 2021. The field and sampling procedures include stormwater and surface water sampling using grab collection methods, sample management (i.e., containers, storage, and shipment), decontamination, and the handling of investigation-derived wastes (IDW). Detailed field and sampling procedures are described in the Sampling and Analysis Plan (SAP) provided in the February 7, 2020 *Work Plan – PDX PFAS Stormwater Monitoring* prepared by Apex. Copies of sampling field forms are included in Attachment A. Sampling locations are displayed on Figure 3.

Preparatory Activities

Site Health and Safety Plan (HASP). The Site-specific HASP for the proposed activities was provided in the 2020 Work Plan and was revised prior to conducting the 2021 field activities. The HASP was prepared in general accordance with the Occupational Safety and Health Administration (OSHA) and the Oregon Administrative Rules (OAR). A copy of the HASP was maintained on-site during the field activities. In addition, prior to performing any on-site work, Apex prepared a Job Safety Analysis (JSA) guiding task-specific activities, risks, and safety protocols for each task. All field staff supporting the project were required to review and follow the HASP and JSAs. Safety topics were refreshed daily with the field crew at a daily safety tailgate meeting led by Apex's Site Supervisor or Site Safety Officer.

Due to the COVID-19 pandemic, additional safety measures were implemented during the field activities. Apex followed a prepared COVID-19 Awareness JSA and the March 31, 2020 Port of Portland COVID-19 requirements letter. The following steps were taken to reduce or eliminate the spread of COVID-19:

- Personnel committed to staying home and away from the job site if they were exhibiting symptoms of COVID-19 as described by the Centers for Disease Control and Prevention (CDC);
- If personnel on the job site began to have symptoms, they were asked to leave immediately;
- Social distancing protocols were followed with spacing greater than 6 feet. Enforcement was handled by the Site Safety Officer as presented in the HASP;
- Common areas and areas of high "hand traffic" were cleaned and disinfected regularly;

- Tools, pens, and paperwork were not shared;
- Personnel washed their hands regularly and thoroughly, and used hand sanitizer if soap and water were not available;
- Nitrile gloves were utilized and changed once they contacted a potentially contaminated surface; and
- All personnel wore cloth face coverings, surgical masks, or N95 masks.

Property Access. Apex provided notification to Port personnel and Port Airfield Operations (OPS) prior to the sampling events and coordinated access to restricted locations at PDX. Due to the presence of locked gates at several sampling locations, Port personnel directly assisted with access during the sampling events. The notification was submitted to OPS in advance and included the following: Port project manager contact information, Apex project manager and PDX field staff contact information, summary of field work, site plan showing work locations, ingress and egress locations for Apex, and work schedule. Apex employees hold a PDX badge to access the Site. Airside OPS was notified of Apex's arrival and departure.

Wet Weather and Dry Weather Sampling

Reconnaissance-level stormwater and surface water sampling activities were conducted at PDX on September 9, 2021 (dry weather event) and December 15, 2021 (wet weather event). During the dry weather event, a total of 12 stormwater samples were collected from PDX outfall, detention pond, and ditch locations, including location OF-1N-NW within Basin 1N, which was previously part of the 2019 quarterly monitoring program and the 2020 stormwater monitoring program (Figure 2). During the wet weather event, a total of 10 stormwater samples were collected. Grab surface water samples were also collected within Basin 1N from locations Ditch B, SW-2, and SW-3, which were also previously part of the 2017, 2018, and 2019 groundwater monitoring programs and the 2020 stormwater monitoring program (Figure 2). During the dry weather event, Ditch B was dry and no sample was collected.

For the wet weather event conducted on December 15, 2021, samples were collected in general accordance with first flush conditions as provided in the approved Work Plan. The weather was monitored leading up to the sampling event and sampling was conducted during a storm event that met the following criteria:

- The sampling event was preceded by a dry period of at least 24 hours (as defined by less than 0.1 inches over the previous 24 hours)
 - Total precipitation 24 hours prior to the storm was 0.01 inches.
- Minimum predicted rainfall intensity was greater than 0.2 inches
 - Actual rainfall generated during the storm was 0.58 inches.
- The expected storm event duration was at least three hours
 - Actual storm duration was approximately 16 hours.

For the dry weather event conducted on September 9, 2021, samples were collected following an extended period of no measurable rainfall (i.e., after at least one week with no measurable rainfall) in accordance with the approved Work Plan.

Surface Water Sample Collection. Surface water grab samples (samples collected above the outfall) were collected using an extension pole and laboratory-supplied sample containers to assess the concentration of PFAS in surface water in the vicinity of and downgradient of the Original and Former Fire Training Facilities within Basin 1. Surface water was collected from the drainage ditch located approximately 2,400 feet northwest of the Original and Former Facilities at the culvert inlet to the stormwater conveyance system (sample location Ditch B). Surface water samples were also collected downstream of the Original and Former Facilities (sample locations SW-2 and SW-3). Surface water sample SW-2 was collected from the drainage ditch at a location immediately east of the drainage ditch at its

intersection with Sunderland Avenue, approximately 1.1 miles southwest of the Former Fire Training Facilities. Surface water sample SW-3 was collected from the drainage ditch near MCDD Pump Station #2, approximately 1.7 miles southwest of the Former Fire Training Facilities.

Stormwater Sample Collection. Stormwater samples were collected either by using a PFAS-free decontaminated sampler or by a direct grab using laboratory-provided PFAS-free containers. The table below describes the stormwater monitoring locations. Dry weather samples are assumed to represent groundwater infiltrating the stormwater system within the basin sampled. Wet weather samples are assumed to have been a mixture of precipitation and groundwater. Stormwater Drainage Basin 1N, monitoring point OF-1N-NW has been sampled as part of the 2017, 2018, and 2019 quarterly groundwater monitoring events for the fire training facilities, and during the 2020 stormwater wet and dry season sampling events. The stormwater sampling activities included all significant stormwater drainage basins at PDX. Additional sub-basins, including sub-basins of Basin 7, were not sampled during the reconnaissance events because they are not significant contributors to the overall basin flow, consist of impervious surfaces and relatively shallow piping, and/or drain through a City of Portland outfall. Additional details regarding stormwater sampling procedures, including qualifying conditions for the wet and dry season sampling, were provided in the SAP within the 2020 Work Plan.

PDX Drainage Basin	Monitoring Point ID	Characterization	On-Flow?	Sampling Point	Notes
1E and 1S	1ES	Mixed stormwater and groundwater	No	1ES is an open ditch at the point where 1S and 1E join	Locations 1E, 1S, and 1ES were sampled during the dry weather event, at the request of the Port
1N	OF-1N-NW	Mixed stormwater and groundwater	No	Manhole	
2A	2	Mixed stormwater and groundwater	No	Quiescent pond inlet	
3	3	Mixed stormwater and groundwater	No	Manhole, asset ID STSMH2482	
4	4	Mixed stormwater and groundwater	No	Quiescent pond inlet	
5	5	Mixed stormwater, groundwater, and Columbia Slough water	No	Manhole, asset ID STSMH1341	
6	6	Mixed stormwater and groundwater	Yes, sample will be mixed with ORANG stormwater and groundwater	Detention pond outlet, before water enters the pump station forebay	
7A	7	Mixed stormwater, groundwater, and Columbia Slough water	Yes, sample will be mixed with ORANG stormwater and groundwater	Manhole, asset ID STSMH525	

PDX Drainage Basin	Monitoring Point ID	Characterization	On-Flow?	Sampling Point	Notes
8	8	Mixed stormwater and groundwater	Yes, on-flow from City of Portland streets	Culvert just north of Alderwood, asset ID STSCU13045	
9	9	Mixed stormwater and groundwater	Yes, extensive off-site inputs	Culvert on the south side of pond feature, asset ID STCU2283	

As presented in the SAP within the approved 2020 Work Plan, quality assurance/quality control (QA/QC) procedures were used throughout this project, including precautions to ensure no PFAS cross-contamination. QA/QC samples were collected, including one duplicate sample, one field blank, and one equipment blank.

Handling of Investigation-Derived Waste

IDW included a small amount of decontamination water (i.e., less than 1 gallon) and personal protective equipment (PPE). Decontamination water was land-applied at each sampling location. PPE was disposed of as solid waste.

ANALYTICAL PROGRAM

Chemical analyses were performed on the stormwater and surface water samples collected by Apex in September and December 2021. Samples were analyzed on a standard turnaround time (15 business days).

Analysis for Chemicals of Potential Concern

All collected stormwater, surface water and QA/QC samples were analyzed for PFAS compounds. PFAS analysis by Isotope Dilution Method (formerly EPA 537 modified) was conducted by Vista Analytical (Vista) in El Dorado Hills, California. Reported PFAS included 24 compounds:

- Perfluorobutane sulfonic acid (PFBS);
- Perfluorobutanoic acid (PFBA);
- Perfluoropentane sulfonic acid (PFPeS);
- Perfluoroheptane sulfonic acid (PFHpS);
- Perfluoropentanoic acid (PFPeA);
- Perfluoroheptanoic acid (PFHpA);
- Perfluorohexane sulfonic acid (PFHxS);
- Perfluorohexanoic acid (PFHxA);
- Perfluorooctane sulfonate (PFOS);
- Perfluorooctanoic acid (PFOA);
- Perfluorotetradecanoic acid (PFTeDA);
- Perfluorononanoic acid (PFNA);
- Perfluorodecanoic acid (PFDA);
- Perfluorononane sulfonic acid (PFNS);
- Perfluorodecane sulfonic acid (PFDS);

- Perfluoroundecanoic acid (PFUdA);
- Perfluorododecanoic acid (PFDoA);
- Perfluorotridecanoic acid (PFTrDA);
- N-Ethylperfluoro-1-octanesulfonamidoacetic acid (N-EtFOSAA);
- N-Methylperfluoro-1-octanesulfonamidoacetic acid (N-MeFOSAA);
- Perfluorooctane sulfonamide (PFOSA); and
- Fluorotelomer sulfonate (C4; 4:2 fluorotelomer sulfonate [FTS]; C6, 6:2 FTS; and C8, 8:2 FTS).

In addition, the samples collected from OF-1N-ES, SW-2, and Basin 6 during the wet weather event (December 15, 2021) were analyzed for 'total' and 'dissolved' PFAS to observe if the turbidity of the collected samples could be affecting the PFAS concentrations that have been detected previously in stormwater at the Site. The sampling locations where this additional analysis was conducted were selected because these locations were previously observed to be turbid (and were centrifuged at the laboratory during the 2020 sampling events), and also have had consistent elevated detections of PFAS. There is currently no standardized method for a "total" and "dissolved" PFAS analysis since standard filters may adsorb PFAS and bias results low. Following discussions with the laboratory (Vista), the following method was used for "total" and "dissolved" analyses:

- The "total" PFAS analysis was conducted with Vista extracting the stormwater in the usual manner per the Isotope Dilution Method. The whole sample bottles were extracted and samples with high turbidity or sediment were centrifuged. The centrifuged solids portion was then solvent-rinsed and added to the extract.
- The "dissolved" PFAS analysis was conducted with Vista centrifuging the samples and only extracting the aqueous portion for analysis.

INVESTIGATION RESULTS

Surface water and stormwater analytical results and laboratory analytical data quality for the samples collected by Apex in September and December 2021 are discussed below. Analytical laboratory reports and a summary of the data quality review are provided in Attachment B. Surface and stormwater results are presented on Figure 3.

Surface Water Analytical Results. Multiple PFAS compounds were detected in samples collected from each of the surface water sampling locations (SW-2, SW-3, and Ditch B). The following compounds exceeded one or more screening levels during the September 2021 (dry weather conditions) sampling event:

- PFOA was detected above the lowest screening criteria (OHA HAL) at SW-2 and SW-3 within Basin 1 in the samples collected in September 2021. Concentrations of PFOA in September 2021 were 262 ng/L at SW-2 and 149 ng/L at SW-3. These concentrations are generally higher than previously detected concentrations of PFOA in samples collected from these locations in 2017 through 2019; however, they are lower than concentrations of PFOA detected in August 2020.
- PFOS was detected above one or more screening criteria in September 2021 for locations SW-2 and SW-3. Concentrations of PFOS in September 2021 were 508 ng/L at SW-2 and 201 ng/L at SW-3.
- PFHxS was detected above the OHA HAL in September 2021. Concentrations of PFHxS in September 2021 were 196 ng/L at SW-2 and 116 ng/L at SW-3.
- The combined concentration of PFOS, PFOA, PFNA and PFHxS exceeded the OHA HAL of 30 ng/L for locations SW-2 (987 ng/L) and SW-3 (477 ng/L).

Ditch B was dry during the dry weather sampling event in September 2021.

During the December 2021 (wet weather conditions) sampling event, multiple PFAS compounds were also detected in each sample location. The following compounds exceeded one or more screening levels during the December 2021 sampling event:

- PFOA was detected above the lowest screening criteria (OHA HAL) at SW-2 within Basin 1 for the sample collected in December 2021, with a concentration of 110 ng/L.
- PFOS was detected above one or more screening criteria at SW-2 and SW-3, with concentrations of 124 ng/L and 15.4 ng/L.
- PFHxS was detected above the OHA HAL at SW-2, with a concentration of 62.8 ng/L.
- The combined concentration of PFOS, PFOA, PFNA, and PFHxS exceeded the OHA HAL at SW-2 and SW-3 in December 2021, with combined concentrations of 295 ng/L and 46.7 ng/L, respectively. The individual detected concentrations of PFOS, PFOA, PFNA, and PFHxS did not exceed the OHA HAL at SW-3.

No exceedances were detected at Ditch B in December 2021, and only five PFAS were detected at trace levels above the reporting limit.

In addition, during the December 2021 sampling event, a “total” and “dissolved” analysis was conducted at SW-2. A comparison of the total and dissolved concentrations is provided in Table 4. Results were reviewed to determine the extent of PFAS concentrations attributable to suspended solids in stormwater and surface water samples. Generally, the total and dissolved results were similar for SW-2 and most relative percent differences in concentration were less than 10%. Overall, the summed concentration of detected PFAS in the “dissolved” sample was 7% greater than the “total” sample; however, this difference is within the expected error associated with sample handling, preparation, and analysis.

Stormwater Analytical Results. Multiple PFAS compounds were detected in samples collected from each of the stormwater sampling locations. The following compounds exceeded one or more screening levels during the September 2021 (dry weather conditions) sampling event:

- PFOA was detected above the lowest screening criteria (OHA HAL) at seven locations (1ES, 1S, 2, 4, 6, 7, and OF-1N-NW), with concentrations ranging between 38.8 ng/L and 241 ng/L.
- PFOS was detected above one or more screening criteria at nine locations (1ES, 1S, 2, 4, 5, 6, 9, and OF-1N-NW) with concentrations ranging between 12.2 ng/L and 433 ng/L.
- PFHxS was detected above the OHA HAL at three locations (1S, 6, and OF-1N-NW) with concentrations ranging between 30.1 ng/L and 193 ng/L.
- PFNA was detected above the OHA HAL at location 7, with a concentration of 52.6 ng/L.
- The combined concentration of PFOS, PFOA, PFNA, and PFHxS exceeded the OHA HAL of 30 ng/L at eight locations (1ES, 1S, 2, 4, 5, 6, 7, and OF-1N-NW) with concentrations ranging between 45.6 ng/L and 884 ng/L.

During the September 2021 (dry weather conditions) event, the samples collected at 1E, 1S, and 1ES indicate that the concentrations of PFAS detected at location 1ES are primarily coming from the 1S sample location (i.e., the pump station reservoir).

The remaining analytical results for September 2021 were generally similar to previous events, with the exception of the sample collected at Basin 7. The concentrations of PFAS observed in the Basin 7 sample were generally higher than previously collected samples. In addition, while not above any of the screening levels, the concentrations of 6:2 FTS and 8:2 FTS were observed to be one to two orders of magnitude greater than previously detected concentrations.

During the December 2021 (wet weather conditions) sampling event, multiple PFAS compounds were also detected in each sample location. The following compounds exceeded one or more screening levels during the December 2021 sampling event:

- PFOA was detected above the lowest screening criteria (OHA HAL) at one location (OF-1N-NW), with a concentration of 241 ng/L
- PFOS was detected above one or more screening criteria at five locations (2, 5, 6, 9, and OF-1N-NW) with concentrations ranging between 13.0 ng/L and 251 ng/L.
- PFHxS was detected above the OHA HAL at two locations (6 and OF-1N-NW) with concentrations of 118 ng/L and 141 ng/L.
- The sum of the detected concentrations of PFOS, PFOA, PFNA, and PFHxS exceeded the OHA HAL at five locations (1ES, 2, 6, 9, and OF-1N-NW) with concentrations ranging between 33.7 ng/L and 634 ng/L.

Overall, concentrations of PFAS detected in the dry weather sampling event were generally higher than concentrations detected during the wet weather sampling event.

In addition, during the December 2021 sampling event, a “total” and “dissolved” analysis was conducted at Basin 6 and OF-1N-NW. A comparison of the total and dissolved concentrations is provided in Table 4. Results were reviewed to determine the extent of PFAS concentrations attributable to suspended solids in stormwater and surface water samples. Generally, both the total and dissolved results were similar and most relative percent differences in concentration were less than 10%. Overall, the summed concentration of detected PFAS in the “dissolved” sample increased slightly by 4.0% for 6 and 5.6% for OF-1N-NW; however, this difference is within the expected error associated with sample handling, preparation, and analysis.

Laboratory Analytical Data Quality. Reynolds Engineering, a small business certified subcontractor, conducted a QA/QC review of the analytical laboratory data for stormwater and surface water sampling events completed in September and December 2021. The results of the data quality control review indicate the data are acceptable for the intended use in this monitoring report; however, some results were “Q” flagged as detections that could not be confirmed by ion ratios and are tentatively identified. Generally, the concentrations of these detections are near the reporting limit since less analyte is present and ion abundances are more likely to fluctuate from calibration criteria. For location 9 during the December 2021 sampling event, the concentration of PFOS was 36.2 ng/L (approximately 30 times the reporting limit), was above the OHA HAL of 30 ng/L, and was flagged as having transition ion ratios outside of the method control limit. PFOS was reported as a detection for location 9 but may or may not be present in the sample and at the concentration reported based on the failing transition ion ratio.

CONCLUSIONS

Apex collected stormwater and surface water samples during wet and dry weather conditions in 2021 at PDX. Overall, concentrations of PFAS detected in stormwater during the dry weather sampling event were higher than concentrations detected during the wet weather sampling event. This difference was also observed during the 2020 sampling events. Concentrations are likely lower during the wet weather event due to rainfall diluting groundwater infiltration. In addition, if there was a recent surface source release of AFFF, it would be expected that concentrations during the wet weather event would be higher. The decrease during the wet weather event supports that there have not been any recent sources of AFFF on-site.

Exceedances of the conservative OHA HALs were observed at locations 1ES, 1S, 2, 4, 5, 6, 7, 9, OF-1N-NW, SW-2, and SW-3 during one or both sampling events. A wide variety of PFAS compounds were detected in all of the collected stormwater and surface water samples, most at low concentrations.

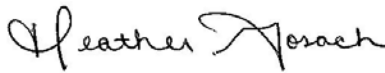
A “total” and “dissolved” PFAS analysis was conducted at locations 6, OF-1N-NW, and SW-2 based on DEQ request. These samples were not filtered due to potential sorption loss of PFAS but were centrifuged and prepared so that only the aqueous portion of the “dissolved” sample was extracted and analyzed. Results greater than five times the reporting limit were reviewed to determine the extent of PFAS concentrations attributable to suspended solids in stormwater and surface water samples. Generally, both the total and dissolved PFAS results were similar in each sample and most relative percent differences were less than 10%. For SW-2, a decrease of 21% was observed for 8:2 FTS; however, the overall percent change for PFAS detected in the sample increased by 6.9%. In conclusion, differences in concentration between the “total” and “dissolved” samples were within the expected error associated with sample handling, preparation, and analysis, and it does not appear that turbidity of the collected water samples is a significant driver in increasing or reducing detected PFAS concentrations.

If you have any questions or would like to discuss this further, please do not hesitate to contact us at (503) 332-5196, Herb.Clough@apexc.com, or (503) 961-0775, Heather.Gosack@apexc.com.

Sincerely,



Herb Clough, P.E.
Vice President



Heather Gosack, R.G.
Associate Geologist

Cc: Mr. Dan Hafley, Oregon Department of Environmental Quality
Mr. Douglas Wise, Portland Water Bureau
Mr. Jack Dahl, Portland Water Bureau

ATTACHMENTS:

Table 1 – Monitoring Program
Table 2 – Field Parameters
Table 3 – Stormwater and Surface Water Analytical Results
Table 4 – Stormwater and Surface Water Analytical Results – Total and Dissolved Percent Difference

Figure 1 – Site Location Map
Figure 2 – PFAS Monitoring Locations
Figure 3 – Stormwater and Surface Water Analytical Results

Attachment A – Field Notes
Attachment B – Analytical Results and Quality Assurance Review

Table 1
Monitoring Program
Portland International Airport
Port of Portland

Monitoring Point ID	Sampling Frequency
Stormwater	
OF1N-NW	2 Events
1ES	2 Events
1E	1 Event (dry weather)
1S	1 Event (dry weather)
2	2 Events
3	2 Events
4	2 Events
5	2 Events
6	2 Events
7	2 Events
8	2 Events
9	2 Events
Surface Water Within Basin 1N	
SW-2	2 Events
SW-3	2 Events
Ditch B	2 Events

Notes:

1. Sampling frequency to include collection during the wet season (December 2021) and the dry season (September 2021).

Table 2
Field Parameters
Portland International Airport
Portland, Oregon

Monitoring Point ID	Sampling Date	Temp (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	pH	ORP (mV)
OF1N-NW	9/9/2021	19.5	4.94	354.4	6.91	56.2
	12/15/2021	11.28	4.43	272	6.66	-12
1ES	9/9/2021	19.3	3.85	428	6.36	-57.2
	12/15/2021	9.30	5.25	252	6.77	29
1E	9/9/2021	19.7	3.71	336	6.26	27.1
1S	9/9/2021	20.5	2.20	248.8	6.50	7.9
2	9/9/2021	20.3	5.07	409.8	7.13	75.3
	12/15/2021	9.55	4.23	222	6.72	56
3	9/9/2021	18.1	6.18	71.6	6.53	117.1
	12/15/2021	5.38	8.28	16	7.27	-16
4	9/9/2021	20.9	2.80	481	6.71	123.5
	12/15/2021	7.26	6.95	194	6.67	-15
5	9/9/2021	20.8	5.37	229.8	6.75	148.1
	12/15/2021	7.78	8.39	72	7.13	93
6	9/9/2021	22.7	3.09	348.9	6.62	120.6
	12/15/2021	7.22	5.84	229	6.85	82
7	9/9/2021	24.4	2.21	204.4	6.61	113.6
	12/15/2021	6.93	4.13	30	7.06	76
8	9/9/2021	21.4	10.04	251.1	7.23	84.1
	12/15/2021	7.09	7.21	252	6.97	130
9	9/9/2021	20.0	6.61	425.3	7.22	84.1
	12/15/2021	8.16	14.92	447	6.36	140
SW-2	9/9/2021	21.2	3.81	317.5	7.08	159.8
	12/15/2021	7.78	7.83	212	6.58	39
SW-3	9/9/2021	22.2	12.16	277.7	8.69	126.1
	12/15/2021	6.82	3.45	189	6.82	112
Ditch B	9/9/2021	Location dry				
	12/15/2021	10.1	1.96	411	6.40	144

Notes:

1. °C = Degrees Celsius.
2. µS/cm = Microsiemens per centimeter.
3. ORP = Oxidation-reduction potential.
4. mg/L (ppm) = Milligrams per liter (parts per million).
5. mV = Millivolts.

Table 3
Stormwater and Surface Water Analytical Results
Portland International Airport
Portland, Oregon

		PFBS	PFBA	PFPeS	PFPeA	PFHxS	PFHxA	PFHpS	PFHpA	PFOS	PFOA	PFNS	PFNA	PFDS	PFDA	PFUnA	PFDoA	PFTrDA	PFTeDA	MeFOSAA	EtFOSAA	PFOSA	4:2 FTS	6:2 FTS	8:2 FTS	ΣPFOS, PFOA, PFNA, PFHxS *
Sample Location	Sample Date	Concentrations in ng/L																								
Oregon Drinking Water Health Advisory Level (HAL)*		--	--	--	--	30	--	--	--	30	30	--	30	--	--	--	--	--	--	--	--	--	--	--	--	30
Florida Freshwater Screening Level for Human Health		--	--	--	--	--	--	--	--	10	500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Michigan Water Quality Value for Non-Drinking Surface Water		--	--	--	--	--	--	--	--	12	12,000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SW-1 (Ditch A)	8/29/2017	111	--	--	--	2,180 H	450 H	--	351	14,500 H	1,110	--	482	--	10.3	<2.23	<2.23	<2.23	<2.23	<2.23	<2.23	--	--	--	--	18,300
SW-2	9/27/2017	11.3	--	--	--	113	97.6	--	47.0	545	131	--	21.4	--	3.96	1.78	<1.07	<1.07	<1.07	<1.07	<1.07	--	--	--	--	810
	5/15/2018	10.2	--	--	--	84.9	126	--	55.6	324	140	--	9.35	--	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	--	--	--	--	558
	2/6/2019	9.74	--	--	--	92.5	139	--	63.6	263	150	--	12.6	--	1.32	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	518
	5/2/2019	12.3	--	--	--	65.6	167	--	106	291	164	--	11.1	--	<1.03	<1.03	<1.03	<1.03	<1.03	<2.07	<1.03	--	--	--	--	532
	8/9/2019	19.7	71.4	24.8	283	210	296	5.98	109	554	273	<1.01	21.9	<1.01	1.93	<1.01	<1.01	<1.01	<1.01	<1.01	<1.01	<1.01	3.62	1,090	49.1	1,060
	11/8/2019	3.90	14.9	4.01	50.2	22.2	33.3	<2.14	19.4	90.2	37.7	<2.14	7.79	<2.14	3.28	<2.14	<2.14	<2.14	<2.14	<2.14	<2.14	<2.14	<2.14	57.4	12.9	158
	5/30/2020	<1.03	4.52	<1.24	9.78	5.20	11.1	<1.03	4.26	29.0	9.87	<1.99	1.53 Q	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	10.3	2.65	45.6
	8/17/2020	22.8	94.4	27.7	383	262	359	6.39	123	617	334	<2.04	25.5	<1.06	2.27	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	<1.06	5.15	1,250	52.8	1,240
	9/9/2021	18.2	105	23.6	467	196	366	5.21	126	508	262	<1.98	21.4	<1.02	1.73	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	1.36	655	20.2	987
	12/15/2021	6.52	30.3	6.32	110	62.8	89.7	1.06	44.0	124	110	<1.88	12.1	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	388	34.4	309
Dissolved	12/15/2021	6.36 H	30.4 H	6.5 H	109 H	56.7 H	83.3 H	1.00 H	45.1 H	113 H	113 H	<1.90 H	12.1 H	<0.980 H	<0.980 H	<0.980 H	<0.980 H	<0.980 H	<0.980 H	<0.980 H	<0.980 H	<0.980 H	<0.980 H	486 H	27.3 H	295 H
SW-3	9/27/2017	8.51	--	--	--	54.0	63.1	--	27.0	323	76.8	--	12.6	--	3.50	<1.08	<1.08	<1.08	<1.08	<1.08	<1.08	--	--	--	--	466
	5/15/2018	12.0	--	--	--	97.5	124	--	52.2	270	142	--	9.53	--	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	--	--	--	--	519
	2/6/2019	9.16	--	--	--	70.6	122	--	53.1	282	133	--	11.5	--	1.10	<1.00	<1.00	<1.00	<1.00	<1.00	<1.00	--	--	--	--	497
	5/2/2019	6.04	--	--	--	27.3	65.6	--	43.2	115	67.2	--	4.65	--	<1.02	<1.02	<1.02	<1.02	<1.02	<2.04	<1.02	--	--	--	--	214
	8/9/2019	12.2	49.1	13.6	209	105	189	4.53	67.4	314	158	<1.02	16.7	<1.02	1.60	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	1.38	339	8.48	594
	11/8/2019	9.44	27.9	9.59 Q	121	56.9	83.7	<2.18	41.1	141	93.8	<2.18	10.3	<2.18	5.19 Q	<2.18	<2.18	<2.18	<2.18	<2.18	<2.18	<2.18	<2.18	240	16.3	302
	5/30/2020	1.48	2.02	<1.26	3.70	3.49	4.31	<1.04	1.40	8.54	6.37	<2.01	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	<1.04	2.54	<1.07	18.4
	8/17/2020	23.8	89.1	26.6	354	233	325	4.33	115	425	288	<2.11	21.4	<1.09	1.90 Q	<1.09	<1.09	<1.09	<1.09	<1.09	<1.09	<1.09	4.22	951	16.9	967
	9/9/2021	11.5	63.9	13.9	296	116	236	2.77	81.8	201	149	<1.99	11.2	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	148	<1.06	477
	12/15/2021	1.70	5.59	<1.24	15.0	14.2	13.2	<1.02	6.97	15.4	15.4	<1.98	1.66	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	25.3	1.96	46.7
Ditch B	5/2/2019	1.31	--	--	--	2.68	5.14	--	3.19	<1.01	12.2	--	<1.01	--	<1.01	<1.01	<1.01	<1.01	<1.01	<1.01	--	--	--	--	14.9	
	5/30/2020	2.51	8.20	<1.24	16.7	6.35	11.3	<1.03	6.30	<1.03	16.0	<1.99	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.03	<1.06	22.4
	8/17/2020	Dry - No Sample Collected.																								
	9/9/2021	Dry - No Sample Collected.																								
	12/15/2021	<1.02	2.63	<1.24	2.99	1.38	1.96	<1.02	<1.02	<1.02	1.31	<1.98	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.05	2.69

Notes:

1. ng/L = Nanograms per liter (parts per trillion).
2. Bold values indicate the compounds was detected above laboratory reporting limits.
3. < = Compound not detected at or above laboratory reporting limit shown.
4. H = Sample was extracted outside of the EPA recommended holding time of 28 days.
5. Q = Identification of analyte could not be confirmed. Ion ratio exceeded control limit.
6. Shading indicates concentration of analyte exceeds one or more screening level values
7. -- = Value not available.
8. * = The Oregon Drinking Water Health Advisory Level (HAL) applies to each individual compound or the sum of PFHxS, PFOS, PFOA, and PFNA. Not detected values are summed as zero.

PFBS Perfluorobutanesulfonic acid (C4)
PFBA Perfluorobutanoic acid (C4)
PFPeS Perfluoropentane sulfonic acid (C5)
PFPeA Perfluoropentanoic acid (C5)
PFHxS Perfluorohexanesulfonic acid (C6)
PFHxA Perfluorohexanoic acid (C6)
PFHpS Perfluoroheptane sulfonic acid (C7)
PFHpA Perfluoroheptanoic acid (C7)
PFOS Perfluorooctanesulfonic acid (C8)
PFOA Perfluorooctanoic acid (C8)

PFNS Perfluorononane sulfonic acid (C9)
PFNA Perfluorononaoic acid (C9)
PFDS Perfluorodecane sulfonic acid (C10)
PFDA Perfluorodecanoic acid (C10)
PFUnA Perfluoroundecanoic acid (C11)
PFDoA Perfluorododecanoic acid (C12)
PFTrDA Perfluorotridecanoic acid (C13)
PFTeDA Perfluorotetradecanoic acid (C14)
MeFOSAA Methyl perfluorooctanesulfonamidoacetic acid (C8)
EtFOSAA Ethyl perfluorooctanesulfonamidoacetic acid (C8)

PFOSA Perfluorooctane sulfonamide (C8)
4:2 FTS Fluorotelomer sulfonate (C4)
6:2 FTS Fluorotelomer sulfonate (C6)
8:2 FTS Fluorotelomer sulfonate (C8)

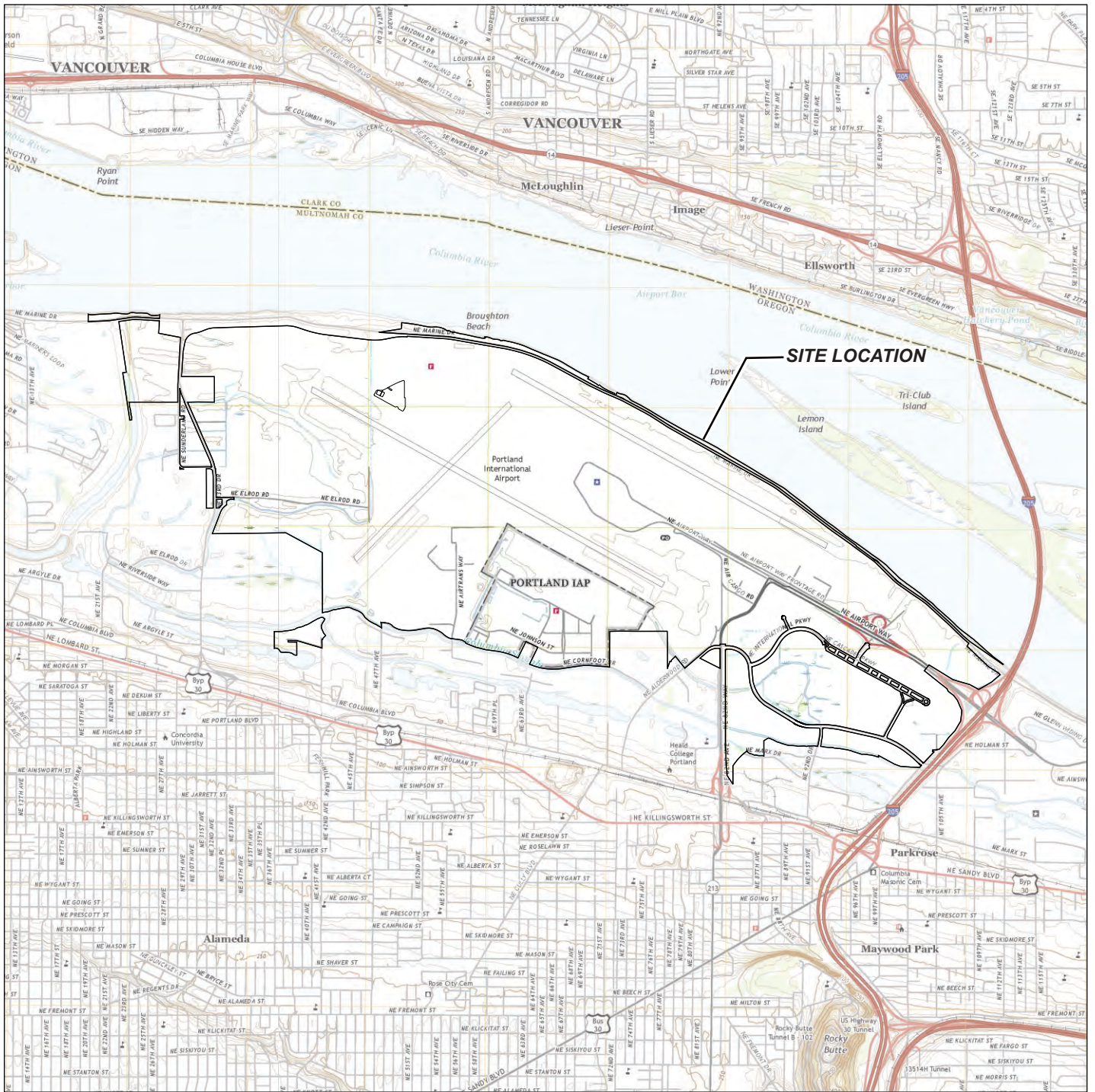
Table 4
Stormwater and Surface Water Analytical Results - Total and Dissolved Percent Difference
Portland International Airport
Portland, Oregon

Sample Location	Sample Date	PFBS	PFBA	PFPeS	PFPeA	PFHxS	PFHxA	PFHpS	PFHpA	PFOS	PFOA	PFNS	PFNA	PFDS	PFDA	PFUnA	PFDoA	PFTrDA	PFTeDA	MeFOSAA	EtFOSAA	PFOSA	4:2 FTS	6:2 FTS	8:2 FTS	ΣPFAS
		Concentrations in ng/L																								
6 Dissolved	12/15/2021	17.0	9.45	17.9	22.8	141	27.9	3.36	11.0	201	24.5	<1.95	2.08	<1.01	1.45	<1.01	<1.01	<1.01	<1.01	<1.01	<1.01	<1.01	<1.01	27.6	2.88	510
	12/15/2021	19.6	9.44	18.9	24.8	142	27.7	3.16	11.7	211	24.2	<1.91	2.18	<0.988	1.29	<0.988	<0.988	<0.988	<0.988	<0.988	<0.988	<0.988	<0.988	31.6	2.66	530
Percent Change		15%	-0.11%	5.6%	8.8%	0.71%	-0.72%	-6.0%	6.4%	5.0%	-1.2%	ND	4.8%	ND	-11.0%	ND	ND	ND	ND	ND	ND	ND	ND	14%	-7.6%	4.0%
OF1N-NW Dissolved	12/15/2021	10.9	56.0	11.1	211	118	171	2.26	81.4	251	241	<1.97	24.2	<1.02	1.14	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	2.45	874	79.0	2,130
	12/15/2021	11.2	57.5	11.4	219	127	174	1.84	93.4	257	258	<1.97	24.2	<1.02	1.03	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	<1.02	2.20	936	75.2	2,250
Percent Change		2.8%	2.7%	2.7%	3.8%	7.6%	1.8%	-19%	15%	2.4%	7.1%	ND	0%	ND	-9.6%	ND	ND	ND	ND	ND	ND	ND	-10%	7.1%	-4.8%	5.6%
SW-2 Dissolved	12/15/2021	6.52	30.3	6.32	110	62.8	89.7	1.06	44.0	124	110	<1.88	12.1	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	<0.970	388	34.4	1,020
	12/15/2021	6.36	30.4	6.47	109	56.7	83.3	0.999	45.1	113	113	<1.90	12.1	<0.980	<0.980	<0.980	<0.980	<0.980	<0.980	<0.980	<0.980	<0.980	<0.980	486	27.3	1,090
Percent Change		-2.5%	0.33%	2.4%	-0.91%	-9.7%	-7.1%	-5.8%	2.5%	-8.9%	2.7%	ND	0%	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25%	-21%	6.9%

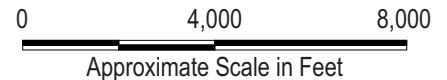
Notes:

1. ng/L = Nanograms per liter (parts per trillion).
2. Bold values indicate the compounds was detected above laboratory reporting limits.
3. < = Compound not detected at or above laboratory reporting limit shown.
4. Red font indicates an increase in dissolved concentrations.
5. ND = Not detected above the reporting limit.

PFBS	Perfluorobutanesulfonic acid (C4)	PFNS	Perfluorononane sulfonic acid (C9)	PFOSA	Perfluorooctane sulfonamide (C8)
PFBA	Perfluorobutanoic acid (C4)	PFNA	Perfluorononaic acid (C9)	4:2 FTS	Fluorotelomer sulfonate (C4)
PFPeS	Perfluoropentane sulfonic acid (C5)	PFDS	Perfluorodecane sulfonic acid (C10)	6:2 FTS	Fluorotelomer sulfonate (C6)
PFPeA	Perfluoropentanoic acid (C5)	PFDA	Perfluorodecanoic acid (C10)	8:2 FTS	Fluorotelomer sulfonate (C8)
PFHxS	Perfluorohexanesulfonic acid (C6)	PFUnA	Perfluoroundecanoic acid (C11)		
PFHxA	Perfluorohexanoic acid (C6)	PFDoA	Perfluorododecanoic acid (C12)		
PFHpS	Perfluoroheptane sulfonic acid (C7)	PFTrDA	Perfluorotridecanoic acid (C13)		
PFHpA	Perfluoroheptanoic acid (C7)	PFTeDA	Perfluorotetradecanoic acid (C14)		
PFOS	Perfluorooctanesulfonic acid (C8)	MeFOSAA	Methyl perfluorooctanesulfonamidoacetic acid (C8)		
PFOA	Perfluorooctanoic acid (C8)	EtFOSAA	Ethyl perfluorooctanesulfonamidoacetic acid (C8)		



Note: Base map prepared from USGS 7.5-minute quadrangle of Portland and Mount Tabor, WA-OR, dated 2020 as provided by USGS.gov.



Site Location Map

Stormwater Monitoring Results Report
Port of Portland
Portland, Oregon



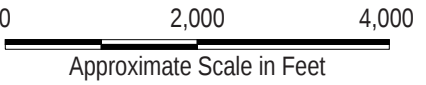
Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number: 320002670-00
Drawn: JP
Approved: HG

February 2022

Figure

1



Legend:

-  PFAS Monitoring Locations
-  Storm Basin Boundary and Designation
-  Port of Portland Property Boundary
-  Oregon Air National Guard (ORANG) Base

PFAS Monitoring Locations

Stormwater Monitoring Results Report
Port of Portland
Portland, Oregon

 Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number: 320002670-00	Drawn: JP	Approved: HG
February 2022		

Figure
2

I:\Client\Port of Portland\Environmental Services Contract\320002550-00 Stormwater PFAS\2021 - Stormwater Results Report\320002670-00.03 (PFAS Results).des



Legend:

- PFAS Monitoring Locations
- Storm Basin Boundary and Designation
- Port Property Boundary
- Oregon Air National Guard (ORANG) Base

SW-2

9/9/2021		12/15/2021	
PFOA	262	PFOA	110
PFOS	508	PFOS	124

PFAS Location Identification

Sample Date

Concentration in nanograms per liter (ng/L)

Q = Identification of the analyte could not be confirmed.

Analyte Sampled

Highlight exceeds Oregon Drinking Water Health Advisory Level

	Risk-Based Screening Levels (ng/L)			
	Recreational User	Construction Worker	Aquatic Organisms - Chronic	Drinking Water Health Advisory
PFOA (Perfluorooctanoic Acid)	50	220	880,000	30
PFOS (Perfluorooctanesulfonic Acid)	1,200	5,300	140,000	30

Stormwater and Surface Water Analytical Results

Stormwater Monitoring Results Report
Port of Portland
Portland, Oregon

Apex Companies, LLC
3015 SW First Avenue
Portland, Oregon 97201

Project Number:	320002670-00	Drawn:	JP	Approved:	HG
February 2022					

Figure
3

Attachment A

Field Notes



3015 SW First Avenue
Portland, Oregon 97201-4707
(503) 924-4704 Phone
(503) 943-6357 Fax

PROJECT NUMBER 2670-00

FIELD REPORT NUMBER 1

PAGE 1 OF 3

DATE 9-9-21

PROJECT	<u>POX SW SAMPLING</u>	ARRIVAL TIME	<u>0915</u>
LOCATION	<u>PORTLAND, OR</u>	DEPARTURE TIME	<u>1458</u>
CLIENT	<u>POD</u>	WEATHER	<u>FAIR 75-85°F</u>
PURPOSE OF OBSERVATIONS	<u>COLLECT SW SAMPLES</u>		
APEX REPRESENTATIVE	<u>M. MASTERSON, C. CLOUGH</u>	APEX PROJECT MANAGER	<u>H. GOSACK</u>
CONTRACTOR	<u>NA + R SCHEITLER</u>	PERMIT NO.	<u>-</u>
CONTRACTOR REP.	<u>NA</u>	H&S REVIEW	<u>✓</u>

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0915 ARRIVE ANSITE / H&SP REVIEW / UTW (m)

VIEW BASIN B. DRY. NO SAMPLE

0955 IES. cloudy. water appears stagnant.

$T=19.3^{\circ}\text{C}$, $\text{pH}=6.36$, $\text{ORP}=-57.2$, $\text{DO}=428.0 \frac{\mu\text{S}}{\text{cm}}$, $\text{DO}=46.6\%$

1007 Sample 1E. sl. cloudy, stagnant water in mt.

$T=19.7^{\circ}\text{C}$, $\text{pH}=6.26$, $\text{DO}=3.71 \text{ mg/L}$, $\text{SPC}=336.0 \frac{\mu\text{S}}{\text{cm}}$, $\text{ORP}=27.1 \text{ mV}$

1025 Sample 1S. sl. cloudy, stag water in vault.

$T=20.5^{\circ}\text{C}$, $\text{pH}=6.50$, $\text{DO}=2.20 \text{ mg/L}$, $\text{SPC}=248.8 \frac{\mu\text{S}}{\text{cm}}$, $\text{ORP}=7.9 \text{ mV}$

1047 Sample 0F-N-NW (IN). slightly cloudy. $T=19.5^{\circ}\text{C}$, $\text{pH}=6.91$,

$\text{DO}=4.94 \text{ mg/L}$, $\text{SPC}=354.4 \frac{\mu\text{S}}{\text{cm}}$, $\text{ORP}=56.2 \text{ mV}$

1111 Sample 2. slightly cloudy, low flow. $T=20.3^{\circ}\text{C}$, $\text{pH}=7.13$

$\text{DO}=5.07 \text{ mg/L}$, $\text{SPC}=409.8 \frac{\mu\text{S}}{\text{cm}}$, $\text{ORP}=75.3 \text{ mV}$

1133 Sample 7, slightly cloudy, stagnant water in MH.

$T=24.4^{\circ}\text{C}$, $\text{pH}=6.61$, $\text{DO}=2.21 \text{ mg/L}$, $\text{SPC}=204.4 \frac{\mu\text{S}}{\text{cm}}$, $\text{ORP}=113.6 \text{ mV}$

BY

REVIEWED BY

APEX REPRESENTATIVE

APEX PROJECT MANAGER



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Portland, Oregon 97201-4707
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(503) 943-6357 Fax

PROJECT NUMBER 2670-00

FIELD REPORT NUMBER 1

PAGE 2 OF 3

DATE 9-9-21

PROJECT	<u>PDX Stormwater Sampling</u>	ARRIVAL TIME	<u>0915</u>
LOCATION	<u>Portland, OR</u>	DEPARTURE TIME	<u>(M) 1458</u>
CLIENT	<u>POP</u>	WEATHER	<u>FAIR 75-85°F</u>
PURPOSE OF OBSERVATIONS	<u>Collect SW samples</u>		
APEX REPRESENTATIVE	<u>MASTERSON, CLOUGH, SCHELLER</u>	APEX PROJECT MANAGER	<u>H. Gosack</u>
CONTRACTOR	<u>NA</u>	PERMIT NO.	<u>-</u>
CONTRACTOR REP.	<u>NA</u>	H&S REVIEW	<u>✓</u>

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1158	Sample 9. Sl. cloudy, no visible flow in pond T = 20.0°C, pH = 7.22, D.O. = 6.61 mg/L, SPC = 425.3 $\frac{\mu S}{cm}$, ORP = 90.9 mV
1218	Sample 8. Sl. cloudy, stagnant water in culvert. T = 21.4°C, pH = 7.23, D.O. = 10.04 mg/L, SPC = 251.1 $\frac{\mu S}{cm}$, ORP = 84.1 mV
1245	Sample 6. Sl. cloudy, no visible flow. Terra Hydra is performing maintenance work on detention Pond upstream of sample pt.
1250	collect Field blank
1255	collect Equipment blank
1311	Sample 5. Part performing maintenance on sample stream upstream of sample location. Stagnant ^{water} flow in mt. Sl. cloudy T = 20.8°C, pH = 6.75, D.O. = 5.37 mg/L, SPC = 229.8 $\frac{\mu S}{cm}$, ORP = 148.1 mV
1328	Sample 4. Construction occurring adjacent to sampling basin. Sl. cloudy. Basin water observed to be flowing slightly T = 20.9°C, pH = 6.71, D.O. = 2.80 mg/L, SPC = 491.0 $\frac{\mu S}{cm}$, ORP = 123.5 mV
1345	Sample 3. Sl. cloudy. water in mt slowly flowing $\pm$ 3-4" deep T = 18.1°C, pH = 6.53, D.O. = 6.18 mg/L, SPC = 71.6 $\frac{\mu S}{cm}$, ORP = 117.1 mV

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PROJECT NUMBER 2670-00
FIELD REPORT NUMBER 1
PAGE 3 OF 3
DATE 9-9-2021

PROJECT	<u>PDX SW SAMPLING</u>	ARRIVAL TIME	<u>0915</u>
LOCATION	<u>Portland, OR</u>	DEPARTURE TIME	<u>1458</u>
CLIENT	<u>POP</u>	WEATHER	<u>FAIR 75-85°F</u>
PURPOSE OF OBSERVATIONS	<u>Collect SW Samples</u>		
APEX REPRESENTATIVE	<u>M. MASTERSON, C. CLOUGH</u>	APEX PROJECT MANAGER	<u>H. GOSACK</u>
CONTRACTOR	<u>NA R. SCHETTLER</u>	PERMIT NO.	<u>—</u>
CONTRACTOR REP.	<u>NA</u>	H&S REVIEW	<u>✓</u>

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1410 Sample SW-2. Cloudy, low flow in ditch (seems stagnant). Slight sheen on water (bio sheen). $T=21.2^{\circ}\text{C}$, $\text{pH}=7.08$, $\text{D.O.}=3.81\text{ mg/L}$
 $\text{SPC}=317.5\frac{\text{ug}}{\text{cm}}$, $\text{ORP}=159.8\text{ mV}$

1432 Sample SW-3. Sl. Cloudy + greenish color. no observable flow but likely some slight flow. $T=22.2^{\circ}\text{C}$, $\text{pH}=8.69$, $\text{D.O.}=12.16\text{ mg/L}$
 $\text{SPC}=277.7\frac{\text{ug}}{\text{cm}}$, $\text{ORP}=126.1\text{ mV}$

1444 land apply 10W - clean water. on Port property.

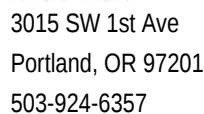
1458 leave site

BY

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FIELD REPORT NUMBER

OF

1

12/15/2021

ARRIVAL TIME 0725

DEPARTURE TIME 1045

CONTRACTOR	N/A
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APEX REPRESENTATIVE	Heather Gosack and Franklin Sullivan	APEX PROJECT MANAGER	Heather Gosack
---------------------	--------------------------------------	----------------------	----------------

1045- Off-site

BY

Heather Nesach

APEX REPRESENTATIVE

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PROJECT NUMBER 2670-00
FIELD REPORT NUMBER _____
PAGE 1 OF 2
DATE 12/15/21

PROJECT	<u>PDX PFAS STRWTZ</u>	ARRIVAL TIME	<u>0715</u>
LOCATION	<u>PDX</u>	DEPARTURE TIME	<u>1155</u>
CLIENT	<u>POP</u>	WEATHER	<u>RAIN ~40°F</u>
PURPOSE OF OBSERVATIONS	<u>COLLECT FIRST FURST STRWTZ SAMPLES</u>		
APEX REPRESENTATIVE	<u>M. MATTERSON</u>	APEX PROJECT MANAGER	<u>H. GOSACK</u>
CONTRACTOR	<u>-</u>	PERMIT NO.	<u>-</u>
CONTRACTOR REP.	<u>-</u>	H&S REVIEW	<u>✓</u>

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0715 ARRIVE ONSITE | H&S REVIEW | CALL AIR OPS + NOTIFY THEM THAT APEX IS ONSITE

0750 MEET BLAKE W/ POP AT BASIN-B DITCH.

0835 RAIN STARTS. LIGHT AT FIRST BUT INCREASES IN INTENSITY

0847 ^{mm} BASIN-B WATER LEVEL INCREASE INDICATING STORMWATER FLOW INTO BASIN. COLLECT BASIN-B SAMPLE. [↑] ONSET OF

PH = 6.40 Temp = 10.10°C ORP = 144mV Cond = 0.411 mS/cm
DO = 1.96 mg/L NTU = 5.3 WATER SL. CLOUDY + STAGNANT

0913 COLLECT SAMPLE OF IN-NW + DUP-1. SL CLOUDY, LOW FLOW
PH = 6.66 T = 11.28°C ORP = -12mV Cond = 0.272 mS/cm
DO = 4.43 mg/L NTU = 24.3

0936 COLLECT IES SAMPLE. SL CLOUDY. LOW FLOW IN MAIN CHANNEL
PH = 6.77 T = 9.30°C ORP = 29mV Cond = 0.252 mS/cm
DO = 5.25 mg/L NTU = 22.6

0951 COLLECT SAMPLE 2. CLOUDY, MOD. FLOW IN MAIN CHANNEL
PH = 6.72 T = 9.55°C ORP = 56mV Cond = 0.222 mS/cm
DO = 4.23 mg/L NTU = 133

BY


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PROJECT NUMBER 267-00

FIELD REPORT NUMBER _____

PAGE 2

OF 2

DATE 12/15/21

PROJECT	<u>PDX PFAS STRM WATER</u>	ARRIVAL TIME	<u>0715</u>
LOCATION	<u>PDX</u>	DEPARTURE TIME	<u>1155</u>
CLIENT	<u>POP</u>	WEATHER	<u>RAIN ~40°F</u>
PURPOSE OF OBSERVATIONS	<u>COLLECT FIRST FLUSH STRM WATER SAMPLES</u>		
APEX REPRESENTATIVE	<u>M. MASTERSON</u>	APEX PROJECT MANAGER	<u>H. LOSACK</u>
CONTRACTOR	<u>-</u>	PERMIT NO.	<u>-</u>
CONTRACTOR REP.	<u>-</u>	H&S REVIEW	<u>✓</u>

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1009 COLLECT SAMPLE 7. CLOUDY, WATER LEVEL ABOVE IN/OUTLET INMIT.
PH = 7.06 T = 6.93°C ORP = 76 mV Cond = 0.030 mS/cm
DO = 4.13 mg/L NTU = 29.4

1130 COLLECT SAMPLE SW-3 - SL CLOUDY, LOW FLOW
PH = 6.82 T = 6.41°C ORP = 112 mV Cond = 0.189 mS/cm
DO = 3.45 mg/L NTU = 30.1

1140 COLLECT EQUIPMENT BLANK (EQ) BY POURING PFAS-FREE WATER
INTO DECONTAMINATED STAINLESS STEEL CONTAINER USED FOR
SAMPLING SOME LOCATIONS

1150 CALL AIR OPS + NOTIFY THEM WE ARE DONE + OFF SITE

1155 LEAVE SITE

BY

REVIEWED BY


APEX REPRESENTATIVE

APEX PROJECT MANAGER

Attachment B

Analytical Results and Quality Assurance Review

Attachment B – Analytical Laboratory Reports and Quality Assurance / Quality Control Review

1.0 Introduction

This attachment documents the results of a quality assurance/quality control (QA/QC) review of the dry and wet season analytical data for stormwater and surface water samples collected in September and December 2021, respectively, at the Portland International Airport, Portland, Oregon. Samples from the Site were analyzed by Vista Analytical Laboratory (Vista) of El Dorado Hills, California in accordance with the *Work Plan – PDX PFAS Stormwater Monitoring* (Apex, 2020). Copies of the analytical laboratory reports are included in this attachment, referenced in Table 1 as follows. The wet season laboratory report was amended to update results for three samples.

Table 1: Analytical Laboratory Reports

Report	Report Date	Sampling Event
2109111	September 9, 2021	Dry Season Stormwater and Surface Water Sampling
2112121	January 26, 2022	Wet Season Stormwater and Surface Water Sampling

2.0 Data Validation

The QA review outlines the applicable quality control criteria utilized during the data review process, as well as any deviations from those criteria. Examination and validation of the laboratory summary reports include:

- Analytical preparation and quantitation methods;
- Analytical method holding times;
- Field and sampling procedures;
- Sample management;
- Chain of custody handling;
- Detection and reporting limits;
- Analyte identification and quantitation;
- Method blank, equipment blank, and field blank detections;
- On-going precision and recovery (OPR) to assess laboratory accuracy; and
- Field duplicate to assess sampling and laboratory precision.

Attachment B – Analytical Laboratory Reports and Quality Assurance / Quality Control Review

The QA/QC review did not include a review of raw data.

This QA/QC review documents the relationship between analytical findings and data quality objectives based on precision and accuracy. It also summarizes possible error or bias and the effect on data quality and usability.

The laboratory quality control (QC) samples provided in data packages were used to evaluate laboratory contamination or background interferences, sample preparation efficiency, instrumentation performance and sample matrix interferences. The QC samples provided by the analytical laboratories include method blanks and ongoing precision and recovery (OPR) samples. Surrogates and labeled standards were also analyzed to assess sample preparation efficiency and matrix interferences.

2.1 Data Qualifiers

Any data that is found to have possible bias or error was qualified and flagged. The following are flags used in this QA/QC review and data tables.

Table 2: Qualifier Flags

H	Extracted or analyzed outside of recommended hold time.
Q	Identification of analyte could not be confirmed. Ion ratio exceeded control limit.

3.0 Analytical Methods

Chemical analyses consisted of the following:

- Per- and polyfluorinated alkyl substances (PFAS) by the Isotope Dilution Method (formerly Modified EPA Method 537).

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

Vista is certified for the Isotope Dilution Method by the National Environmental Laboratory Accreditation Program (NELAP) (under Modified EPA Method 537).

Attachment B – Analytical Laboratory Reports and Quality Assurance / Quality Control Review

Three of the submitted samples were analyzed for dissolved and total PFAS. Total PFAS analysis was conducted per method standards, with aqueous sample extractions and solvent-rinsed centrifuged sediments combined for analysis. Dissolved PFAS analysis included only the aqueous sample extractions for analysis.

4.0 Data Quality Assurance Review

The general QA objectives for this project were to develop and implement procedures for obtaining, evaluating, and confirming the usability of data of a specified quality. To collect such information, analytical data must have an appropriate degree of accuracy and reproducibility, samples collected must be representative of actual field conditions, and samples must be collected and analyzed using unbroken chain-of-custody procedures.

Reporting limits and analytical results were compared to cleanup and screening levels for each parameter in the matrix of concern. Precision, accuracy, completeness, and comparability parameters used to indicate data quality are defined below.

4.1 Field and Sampling Procedures

Stormwater and surface water sample were collected using a decontaminated telescoping swing and transferred to the sample container, or directly collected into the laboratory-provided sample container.

To prevent cross-contamination between sampling events, clean, dedicated sampling equipment (e.g., groundwater sampling tubing) was used for each sampling event and was discarded after use. Cleaning of non-disposable items (i.e., field meter, telescoping swing sampler, and water level probe) consisted of washing in a detergent (Alconox®) solution, rinsing with tap water, followed by a PFAS-free water rinse.

Samples were collected in two 250 milliliter (mL) HDPE containers per sample location. Container lids were also constructed out of HDPE. All sample containers were provided by the laboratory and certified PFAS-free. Labels containing the sample identification, sample date, and sample time were affixed to containers. This same identification information was recorded on the chain of custody document. After collection, sample containers were placed within one Ziploc® bag per sample location and chilled on wet ice.

To avoid PFAS contamination, sampling personnel avoided using items containing polytetrafluoroethylene (PTFE, also known as Teflon), low-density polyethylene (LDPE) or polypropylene as well as other items that contain PFAS, such as aluminum foil, post-it notes, waterproof field books, markers, chemical ice packs (e.g., blue ice), certain decontamination soaps, and certain product packaging (e.g., such as that found on pre-wrapped foods and snacks). Similarly, many clothing items contain PFAS, such as those coated with Teflon or incorporating a Gore-Tex membrane. Clothing items were only worn if they had been washed at

Attachment B – Analytical Laboratory Reports and Quality Assurance / Quality Control Review

least six times. Field personnel avoided the use of cosmetics, moisturizers, and hand cream. Insect repellent and sunscreen were avoided and alternative skins barriers (e.g. long sleeve clothing, wide-brimmed hats, etc.) were used. PFAS contamination prevention protocols were reviewed with personnel daily during the field activities. Before any samples are collected, the sample handler washed their hands and wore nitrile gloves while collecting and sealing sample containers

4.2 Sample Management

Chain of custody documents were implemented for handling and managing samples. The chain of custody documents were appropriately filled out with sample identification, sample date, sample time, and analysis to be performed. The dry season chain of custody documents were relinquished by the Apex Companies sampler and received by Vista; however, the wet season documents did not include a relinquishing signature.

Samples were shipped to Vista via FedEx and were packed with wet ice in one ice chest per sampling event. Upon receipt by the laboratory, sample temperatures for the dry and wet season coolers were recorded as 3.6 degrees Celsius (°C) and 3.8°C, respectively. The lab notes that Samples SW-3 and EQ were listed as 10:30 and 10:40 on their respective containers, whereas the chain-of-custody listed their respective times as 11:30 and 11:40. There were otherwise no significant discrepancies between sample container labels and information documented on the chain of custody.

Upon receipt, the laboratory noted particulate matter in water collected from locations OF1N-NW_dissolved, 2, 7, 6, 6_dissolved, 5, 4, and SW-2_dissolved that required centrifuging prior to extraction in the wet season sample set. Centrifuging is a standard practice when extracting PFAS samples since particulates will clog the solid-phase extraction (SPE) cartridge. If SPE cartridges are clogged, it interferes with the extraction process and lowers the recoveries of the internal standards. The solids from the centrifuging are also rinsed in methanol, which is included in the extraction, except in the case of the dissolved samples (OF1N-NW_dissolved, 6_dissolved, and SW-2_dissolved) where the solid fractions were not rinsed. The PFAS reported by the laboratory are almost exclusively found in the aqueous portion of the samples. The longer carbon chain PFAS will sorb more to the particulate; however, this will also result in lower recoveries for longer-chain internal standards.

4.3 Holding Times

The holding time is the minimum amount of time the sample can be stored before analytes start to degrade and are not representative of initial sampling concentrations. Water samples to be analyzed for PFAS should be extracted within 14 days from collection. Extracts can be stored up to 28 days before analysis. Samples were extracted and analyzed within the method specified holding times, except dissolved samples OF1N-NW_dissolved, 6_dissolved, and SW-2_dissolved were re-extracted outside of the recommended hold time. These samples have been qualified as extracted outside of the recommended hold time (H).

Attachment B – Analytical Laboratory Reports and Quality Assurance / Quality Control Review

4.4 Reporting Limits

Reporting limits are the lowest concentration an instrument is capable of accurately detecting an analyte. They are determined by the laboratory and are based on instrumentation capabilities, the matrix of field samples, sample preparation procedures and EPA suggested reporting limits. Reporting limits for PFAS were consistent with historical data and below promulgated screening values.

4.5 Analyte Identification and Quantitation

Labeled standards are spiked directly into samples before preparation to determine matrix interferences and concentration of analytes. Recovery of these labeled standards automatically corrects sample concentration due to isotope dilution. Data quality is not considered affected if the signal-to-noise ratio is greater than 10:1, which was achieved. No data is flagged in the data table.

Ion ratios were outside of control limits for the following samples in the dry season sample set: 4:2FTS and 8:2FTS from location 2; PFNA from location 5; PFTeDA from location 7; PFHpA from location 9; PFDA from location 1 ES; PFHpA from location 1E; and PFDA from location 1S. Ion ratios help to identify compounds in complex matrices. When ion ratios are exceeded, the positive identification for the analyte is not confirmed, and the analyte is only suspected as being present in the sample. These results are 'Q' flagged in the table as analytes that are suspected to be present, but the identification could not be confirmed with ion ratios.

4.6 Method Blanks

A method – or laboratory – blank is a quality control sample prepared by the laboratory from an analyte-free matrix and analyzed in an analytical batch along with environmental and other QC samples. It is used to assess laboratory contamination or background interferences. Target PFAS were not detected in the analytical batch method blank samples.

4.7 Equipment Blank

An equipment blank is a sample of analyte-free water poured over or through decontaminated field sampling equipment during a sampling event. Equipment blanks assess contamination from the total sampling, sample preparation, and measurement process when decontaminated sampling equipment is used to collect samples.

One equipment blank was analyzed per sampling event and target PFAS were not detected.

Attachment B – Analytical Laboratory Reports and Quality Assurance / Quality Control Review

4.8 Field Blank

One field blank was collected during the stormwater monitoring event. The field blank sample was filled at the laboratory with PFAS-free water and shipped to the sampling site with the sampling bottles. For each field blank shipped, an empty sample bottle will also be shipped. At the sampling site, the sampler transferred the water within the laboratory-supplied container to another empty container while in the field. Field blanks assess potential contamination during shipment and from ambient conditions while sampling.

One field blank was analyzed per sampling event and target PFAS were not detected.

4.9 Accuracy

Accuracy compares the accepted reference concentration of an analyte to the concentration determined analytically. Accuracy is measured as a percent recovery. This recovery must be within a certain range – or control limit – for the data in an analytical batch to be considered acceptable. The analytical laboratory provides quality control samples and surrogates to help determine the accuracy and acceptability of the data reported. These quality control samples and surrogates are discussed below.

4.9.1 Ongoing Precision and Recovery (OPR)

Ongoing precision and recovery (OPR) quality control samples were analyzed in place of LCS/LCSDs for PFAS analysis. Laboratory control samples (LCS) and laboratory control duplicate samples (LCSD) were analyzed by the laboratory to assess the accuracy of the analytical methods. The LCS and LCSD are prepared from an analyte-free matrix that is spiked with known levels of compounds of concern. The concentrations are measured and compared to the known spiked levels; expressed as a percent recovery. This percent recovery must be within method or laboratory defined control limits for data to be considered acceptable. Analytes were recovered within OPR quality control limits.

4.10 Precision

Precision is measured by how close values of duplicate analyses are to each other. These duplicate analyses are prepared from separate aliquots of the same sample and are analyzed at the same (or similar) time. Precision in the field ensures that samples taken are representative of field concentrations; this is demonstrated by field duplicates. Analytical precision is the ability of the laboratory to reproduce results that are similar to each other; this is measured through duplicate analysis of environmental and batch QC samples. Precision is estimated by the relative percent difference (RPD) between the original analysis and the duplicate analysis.

Attachment B – Analytical Laboratory Reports and Quality Assurance / Quality Control Review

4.10.1 Field Duplicate

A field duplicate is a second field sample collected from a selected sample location. Field duplicate samples serve as a check on laboratory precision, sampling quality, as well as potential variability of the sample matrix. The field duplicate is analyzed and compared to the original sample to assess precision. This comparison can be expressed by the RPD between the original and duplicate samples. Field duplicate samples are controlled if the reported result is greater than five times the reporting limit.

Field duplicates were collected from location 6 in the dry season and OF1N-NW in the wet season. The majority of detected PFAS in both events were greater than five times the reporting limit, and were within the 30 percent RPD control limit.

5.0 Conclusion

In conclusion, the QA objectives have been met and the data are of sufficient quality for use in this project.



October 27, 2021

Vista Work Order No. 2109111

Ms. Heather Gosack
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

Dear Ms. Gosack,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on September 11, 2021 under your Project Name 'PDX Fire Training Facility'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at jfox@vista-analytical.com.

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

Sincerely,

Jamie Fox
Laboratory Director



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

Vista Work Order No. 2109111

Case Narrative

Sample Condition on Receipt:

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

Analytical Notes:

PFAS Isotope Dilution Method

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

Holding Times

The samples were extracted and analyzed within the hold times.

Quality Control

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

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

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

TABLE OF CONTENTS

Case Narrative.....	1
Table of Contents.....	3
Sample Inventory.....	4
Analytical Results.....	5
Qualifiers.....	44
Certifications.....	45
Sample Receipt.....	48

Sample Inventory Report



Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2109111-01	SW-3	09-Sep-21 14:32	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-02	SW-2	09-Sep-21 14:10	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-03	5	09-Sep-21 13:11	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-04	3	09-Sep-21 13:45	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-05	4	09-Sep-21 13:28	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-06	6	09-Sep-21 12:45	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-07	9	09-Sep-21 11:58	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-08	8	09-Sep-21 12:18	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-09	7	09-Sep-21 11:33	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-10	2	09-Sep-21 11:11	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-11	1 ES	09-Sep-21 09:55	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-12	OF-1N-NW	09-Sep-21 10:47	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-13	6-DUP	09-Sep-21 13:45	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-14	FB	09-Sep-21 12:50	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-15	EB	09-Sep-21 12:55	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-16	1E	09-Sep-21 10:07	11-Sep-21 10:40	HDPE Bottle, 250 mL
2109111-17	1S	09-Sep-21 10:25	11-Sep-21 10:40	HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	B1I0097-BLK1	Column:	BEH C18
Project:	PDX Fire Training Facility						

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFPeA	2706-90-3	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFBS	375-73-5	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
4:2 FTS	757124-72-4	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFHxA	307-24-4	ND	1.09		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFPeS	2706-91-4	ND	1.21		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFHpA	375-85-9	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFHxS	355-46-4	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
6:2 FTS	27619-97-2	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFOA	335-67-1	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFHpS	375-92-8	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFNA	375-95-1	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFOSA	754-91-6	ND	1.00		B1I0097	22-Sep-21	0.250 L	19-Oct-21 19:25	1
PFOS	1763-23-1	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFDA	335-76-2	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
8:2 FTS	39108-34-4	ND	1.03		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFNS	68259-12-1	ND	1.94		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
MeFOSAA	2355-31-9	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
EtFOSAA	2991-50-6	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFUnA	2058-94-8	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFDS	335-77-3	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFDoA	307-55-1	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFTTrDA	72629-94-8	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
PFTeDA	376-06-7	ND	1.00		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	68.6	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C3-PFPeA	IS	66.2	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C3-PFBS	IS	66.9	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C2-4:2 FTS	IS	92.8	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C2-PFHxA	IS	66.2	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C4-PFHpA	IS	70.1	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C3-PFHxS	IS	72.3	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C2-6:2 FTS	IS	59.0	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C5-PFNA	IS	65.1	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C8-PFOSA	IS	34.8	10 - 150		B1I0097	22-Sep-21	0.250 L	19-Oct-21 19:25	1
13C2-PFOA	IS	68.9	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C8-PFOS	IS	67.5	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1
13C2-PFDA	IS	60.1	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1

Sample ID: Method Blank					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility					Laboratory Data Lab Sample: B1I0097-BLK1 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-8:2 FTS	IS	67.4	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1	
d3-MeFOSAA	IS	51.9	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1	
13C2-PFUnA	IS	63.7	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1	
d5-EtFOSAA	IS	56.8	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1	
13C2-PFDoA	IS	56.4	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1	
13C2-PFTeDA	IS	59.8	20 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 21:58	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: OPR
PFAS Isotope Dilution Method

Client Data						Laboratory Data					
Name:	Apex Companies, LLC		Matrix:	Aqueous		Lab Sample:	B1I0097-BS1		Column:	BEH C18	
Project:	PDX Fire Training Facility										
Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	7.39	8.00	92.3	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFPeA	2706-90-3	7.17	8.00	89.7	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFBS	375-73-5	6.99	8.00	87.4	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
4:2 FTS	757124-72-4	6.62	8.00	82.8	60 - 145		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFHxA	307-24-4	7.31	8.00	91.3	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFPeS	2706-91-4	6.83	8.00	85.3	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFHpA	375-85-9	7.65	8.00	95.6	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFHxS	355-46-4	7.70	8.00	96.2	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
6:2 FTS	27619-97-2	9.81	8.00	123	60 - 140		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFOA	335-67-1	8.60	8.00	107	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFHpS	375-92-8	6.35	8.00	79.4	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFNA	375-95-1	7.45	8.00	93.1	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFOSA	754-91-6	7.43	8.00	92.8	65 - 140		B1I0097	22-Sep-21	0.250 L	19-Oct-21 19:35	1
PFOS	1763-23-1	5.84	8.00	73.0	65 - 140		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFDA	335-76-2	7.19	8.00	89.9	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
8:2 FTS	39108-34-4	7.40	8.00	92.5	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFNS	68259-12-1	7.08	8.00	88.5	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
MeFOSAA	2355-31-9	7.60	8.00	95.0	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
EtFOSAA	2991-50-6	7.84	8.00	98.0	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFUnA	2058-94-8	7.08	8.00	88.5	65 - 140		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFDS	335-77-3	6.28	8.00	78.5	50 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFDaA	307-55-1	7.81	8.00	97.6	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFTTrDA	72629-94-8	7.17	8.00	89.6	60 - 140		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
PFTeDA	376-06-7	7.51	8.00	93.9	65 - 135		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
Labeled Standards	Type			% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS			77.9	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C3-PFPeA	IS			79.2	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C3-PFBS	IS			77.1	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-4:2 FTS	IS			101	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-PFHxA	IS			79.9	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C4-PFHpA	IS			83.8	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C3-PFHxS	IS			83.5	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-6:2 FTS	IS			69.1	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C5-PFNA	IS			75.2	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C8-PFOSA	IS			34.0	10 - 150		B1I0097	22-Sep-21	0.250 L	19-Oct-21 19:35	1

Sample ID: OPR
PFAS Isotope Dilution Method

Client Data				Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	B1I0097-BS1	Column:	BEH C18		
Project:	PDX Fire Training Facility								
Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFOA	IS	79.9	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C8-PFOS	IS	82.4	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-PFDA	IS	84.1	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-8:2 FTS	IS	74.9	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
d3-MeFOSAA	IS	74.4	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-PFUnA	IS	78.3	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
d5-EtFOSAA	IS	64.7	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-PFDoA	IS	63.6	25 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1
13C2-PFTeDA	IS	68.0	20 - 150		B1I0097	22-Sep-21	0.250 L	22-Oct-21 22:09	1

Sample ID: SW-3
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-01	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 14:32	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	63.9	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFPeA	2706-90-3	296	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFBS	375-73-5	11.5	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
4:2 FTS	757124-72-4	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFHxA	307-24-4	236	1.12		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFPeS	2706-91-4	13.9	1.25		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFHpA	375-85-9	81.8	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFHxS	355-46-4	116	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
6:2 FTS	27619-97-2	148	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFOA	335-67-1	149	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFHpS	375-92-8	2.77	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFNA	375-95-1	11.2	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFOSA	754-91-6	ND	1.03		B1I0097	22-Sep-21	0.243 L	19-Oct-21 20:17	1
PFOS	1763-23-1	201	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFDA	335-76-2	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
8:2 FTS	39108-34-4	ND	1.06		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFNS	68259-12-1	ND	1.99		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
MeFOSAA	2355-31-9	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
EtFOSAA	2991-50-6	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFUnA	2058-94-8	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFDS	335-77-3	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFDoA	307-55-1	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFTTrDA	72629-94-8	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
PFTeDA	376-06-7	ND	1.03		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	58.6	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C3-PFPeA	IS	69.3	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C3-PFBS	IS	69.5	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C2-4:2 FTS	IS	92.4	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C2-PFHxA	IS	70.2	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C4-PFHpA	IS	69.6	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C3-PFHxS	IS	67.7	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C2-6:2 FTS	IS	61.7	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C5-PFNA	IS	63.2	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C8-PFOSA	IS	37.2	10 - 150		B1I0097	22-Sep-21	0.243 L	19-Oct-21 20:17	1
13C2-PFOA	IS	66.2	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1
13C8-PFOS	IS	56.1	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1

Sample ID: SW-3					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 14:32					Laboratory Data Lab Sample: 2109111-01 Date Received: 11-Sep-21 10:40 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	44.8	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1	
13C2-8:2 FTS	IS	43.7	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1	
d3-MeFOSAA	IS	41.4	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1	
13C2-PFUnA	IS	42.8	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1	
d5-EtFOSAA	IS	47.6	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1	
13C2-PFDoA	IS	41.9	25 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1	
13C2-PFTeDA	IS	37.4	20 - 150		B1I0097	22-Sep-21	0.243 L	22-Oct-21 22:51	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: SW-2
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-02	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 14:10	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	105	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFPeA	2706-90-3	467	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFBS	375-73-5	18.2	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
4:2 FTS	757124-72-4	1.36	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFHxA	307-24-4	366	1.12		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFPeS	2706-91-4	23.6	1.24		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFHpA	375-85-9	126	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFHxS	355-46-4	196	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
6:2 FTS	27619-97-2	655	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFOA	335-67-1	262	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFHpS	375-92-8	5.21	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFNA	375-95-1	21.4	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFOSA	754-91-6	ND	1.02		B1I0097	22-Sep-21	0.244 L	19-Oct-21 20:28	1
PFOS	1763-23-1	508	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFDA	335-76-2	1.73	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
8:2 FTS	39108-34-4	20.2	1.06		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFNS	68259-12-1	ND	1.98		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
MeFOSAA	2355-31-9	ND	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
EtFOSAA	2991-50-6	ND	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFUnA	2058-94-8	ND	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFDS	335-77-3	ND	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFDoA	307-55-1	ND	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFTTrDA	72629-94-8	ND	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
PFTeDA	376-06-7	ND	1.02		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	69.7	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C3-PFPeA	IS	80.6	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C3-PFBS	IS	78.2	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C2-4:2 FTS	IS	104	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C2-PFHxA	IS	81.2	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C4-PFHpA	IS	80.7	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C3-PFHxS	IS	80.7	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C2-6:2 FTS	IS	78.3	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C5-PFNA	IS	82.1	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C8-PFOSA	IS	50.8	10 - 150		B1I0097	22-Sep-21	0.244 L	19-Oct-21 20:28	1
13C2-PFOA	IS	78.8	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1
13C8-PFOS	IS	75.6	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1

Sample ID: SW-2					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 14:10					Laboratory Data Lab Sample: 2109111-02 Date Received: 11-Sep-21 10:40 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	79.0	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1	
13C2-8:2 FTS	IS	80.3	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1	
d3-MeFOSAA	IS	80.0	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1	
13C2-PFUnA	IS	83.2	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1	
d5-EtFOSAA	IS	81.0	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1	
13C2-PFDoA	IS	79.5	25 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1	
13C2-PFTeDA	IS	64.4	20 - 150		B1I0097	22-Sep-21	0.244 L	22-Oct-21 23:12	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: 5
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-03	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 13:11	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.38	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFPeA	2706-90-3	6.64	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFBS	375-73-5	4.25	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
4:2 FTS	757124-72-4	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFHxA	307-24-4	5.82	1.07		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFPeS	2706-91-4	ND	1.19		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFHpA	375-85-9	3.64	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFHxS	355-46-4	7.58	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
6:2 FTS	27619-97-2	1.41	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFOA	335-67-1	9.15	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFHpS	375-92-8	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFNA	375-95-1	1.60	0.982	Q	B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFOSA	754-91-6	ND	0.982		B1I0097	22-Sep-21	0.255 L	19-Oct-21 21:10	1
PFOS	1763-23-1	27.3	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFDA	335-76-2	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
8:2 FTS	39108-34-4	1.11	1.01		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFNS	68259-12-1	ND	1.90		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
MeFOSAA	2355-31-9	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
EtFOSAA	2991-50-6	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFUnA	2058-94-8	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFDS	335-77-3	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFDoA	307-55-1	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFTTrDA	72629-94-8	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
PFTeDA	376-06-7	ND	0.982		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	68.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C3-PFPeA	IS	76.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C3-PFBS	IS	74.7	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C2-4:2 FTS	IS	103	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C2-PFHxA	IS	75.3	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C4-PFHpA	IS	77.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C3-PFHxS	IS	78.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C2-6:2 FTS	IS	75.5	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C5-PFNA	IS	71.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C8-PFOSA	IS	52.0	10 - 150		B1I0097	22-Sep-21	0.255 L	19-Oct-21 21:10	1
13C2-PFOA	IS	76.5	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1
13C8-PFOS	IS	78.1	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1

Sample ID: 5					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 13:11					Laboratory Data Lab Sample: 2109111-03 Date Received: 11-Sep-21 10:40 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	73.8	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1	
13C2-8:2 FTS	IS	67.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1	
d3-MeFOSAA	IS	63.6	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1	
13C2-PFUnA	IS	73.1	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1	
d5-EtFOSAA	IS	66.7	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1	
13C2-PFDoA	IS	72.0	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1	
13C2-PFTeDA	IS	60.0	20 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:33	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: 3
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-04	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 13:45	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	5.09	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFPeA	2706-90-3	4.46	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFBS	375-73-5	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
4:2 FTS	757124-72-4	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFHxA	307-24-4	8.01	1.11		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFPeS	2706-91-4	ND	1.23		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFHpA	375-85-9	4.15	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFHxS	355-46-4	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
6:2 FTS	27619-97-2	5.88	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFOA	335-67-1	9.64	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFHpS	375-92-8	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFNA	375-95-1	3.07	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFOSA	754-91-6	ND	1.02		B1I0097	22-Sep-21	0.246 L	19-Oct-21 21:20	1
PFOS	1763-23-1	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFDA	335-76-2	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
8:2 FTS	39108-34-4	15.2	1.05		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFNS	68259-12-1	ND	1.97		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
MeFOSAA	2355-31-9	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
EtFOSAA	2991-50-6	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFUnA	2058-94-8	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFDS	335-77-3	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFDoA	307-55-1	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFTTrDA	72629-94-8	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
PFTeDA	376-06-7	ND	1.02		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	76.9	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C3-PFPeA	IS	77.8	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C3-PFBS	IS	76.2	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C2-4:2 FTS	IS	104	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C2-PFHxA	IS	71.9	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C4-PFHpA	IS	65.2	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C3-PFHxS	IS	67.3	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C2-6:2 FTS	IS	55.3	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C5-PFNA	IS	52.6	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C8-PFOSA	IS	33.1	10 - 150		B1I0097	22-Sep-21	0.246 L	19-Oct-21 21:20	1
13C2-PFOA	IS	54.2	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C8-PFOS	IS	55.8	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1

Sample ID: 3	PFAS Isotope Dilution Method
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Client Data	Laboratory Data
Name: Apex Companies, LLC Project: PDX Fire Training Facility	Matrix: Aqueous Date Collected: 09-Sep-21 13:45 Lab Sample: 2109111-04 Date Received: 11-Sep-21 10:40 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	56.1	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C2-8:2 FTS	IS	73.2	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
d3-MeFOSAA	IS	47.5	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C2-PFUnA	IS	53.0	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
d5-EtFOSAA	IS	57.4	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C2-PFDoA	IS	50.8	25 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1
13C2-PFTeDA	IS	39.6	20 - 150		B1I0097	22-Sep-21	0.246 L	22-Oct-21 23:43	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 4
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-05	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 13:28	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	11.8	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFPeA	2706-90-3	26.4	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFBS	375-73-5	3.07	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
4:2 FTS	757124-72-4	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFHxA	307-24-4	21.0	1.07		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFPeS	2706-91-4	ND	1.19		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFHpA	375-85-9	17.0	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFHxS	355-46-4	9.42	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
6:2 FTS	27619-97-2	43.1	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFOA	335-67-1	35.6	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFHpS	375-92-8	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFNA	375-95-1	1.83	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFOSA	754-91-6	ND	0.980		B1I0097	22-Sep-21	0.255 L	19-Oct-21 21:31	1
PFOS	1763-23-1	12.2	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFDA	335-76-2	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
8:2 FTS	39108-34-4	8.66	1.01		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFNS	68259-12-1	ND	1.90		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
MeFOSAA	2355-31-9	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
EtFOSAA	2991-50-6	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFUnA	2058-94-8	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFDS	335-77-3	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFDoA	307-55-1	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFTTrDA	72629-94-8	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
PFTeDA	376-06-7	ND	0.980		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	78.0	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C3-PFPeA	IS	83.7	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C3-PFBS	IS	83.3	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C2-4:2 FTS	IS	115	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C2-PFHxA	IS	85.2	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C4-PFHpA	IS	85.2	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C3-PFHxS	IS	83.0	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C2-6:2 FTS	IS	74.7	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C5-PFNA	IS	71.9	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C8-PFOSA	IS	40.5	10 - 150		B1I0097	22-Sep-21	0.255 L	19-Oct-21 21:31	1
13C2-PFOA	IS	84.7	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C8-PFOS	IS	79.9	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1

Sample ID: 4	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 13:28	Laboratory Data Lab Sample: 2109111-05 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	85.2	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C2-8:2 FTS	IS	69.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
d3-MeFOSAA	IS	71.7	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C2-PFUnA	IS	79.7	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
d5-EtFOSAA	IS	63.4	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C2-PFDoA	IS	87.2	25 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1
13C2-PFTeDA	IS	70.4	20 - 150		B1I0097	22-Sep-21	0.255 L	22-Oct-21 23:54	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 6
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-06	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 12:45	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	24.9	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFPeA	2706-90-3	74.2	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFBS	375-73-5	17.2	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
4:2 FTS	757124-72-4	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFHxA	307-24-4	74.7	1.09		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFPeS	2706-91-4	18.4	1.21		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFHpA	375-85-9	30.1	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFHxS	355-46-4	119	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
6:2 FTS	27619-97-2	39.5	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFOA	335-67-1	79.2	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFHpS	375-92-8	4.71	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFNA	375-95-1	6.56	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFOSA	754-91-6	ND	0.998		B1I0097	22-Sep-21	0.251 L	19-Oct-21 21:41	1
PFOS	1763-23-1	237	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFDA	335-76-2	5.16	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
8:2 FTS	39108-34-4	1.23	1.03		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFNS	68259-12-1	ND	1.93		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
MeFOSAA	2355-31-9	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
EtFOSAA	2991-50-6	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFUnA	2058-94-8	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFDS	335-77-3	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFDoA	307-55-1	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFTTrDA	72629-94-8	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
PFTeDA	376-06-7	ND	0.998		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	75.5	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C3-PFPeA	IS	85.1	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C3-PFBS	IS	84.9	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C2-4:2 FTS	IS	115	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C2-PFHxA	IS	82.0	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C4-PFHpA	IS	81.7	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C3-PFHxS	IS	86.5	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C2-6:2 FTS	IS	74.5	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C5-PFNA	IS	72.9	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C8-PFOSA	IS	50.3	10 - 150		B1I0097	22-Sep-21	0.251 L	19-Oct-21 21:41	1
13C2-PFOA	IS	85.4	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C8-PFOS	IS	82.6	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1

Sample ID: 6	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Aqueous Date Collected: 09-Sep-21 12:45 Lab Sample: 2109111-06 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	85.2	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C2-8:2 FTS	IS	94.6	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
d3-MeFOSAA	IS	82.4	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C2-PFUnA	IS	77.9	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
d5-EtFOSAA	IS	80.6	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C2-PFDoA	IS	87.5	25 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1
13C2-PFTeDA	IS	71.5	20 - 150		B1I0097	22-Sep-21	0.251 L	23-Oct-21 00:15	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 9
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-07	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 11:58	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	4.83	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFPeA	2706-90-3	7.86	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFBS	375-73-5	3.41	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
4:2 FTS	757124-72-4	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFHxA	307-24-4	7.85	1.08		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFPeS	2706-91-4	ND	1.20		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFHpA	375-85-9	2.53	0.994	Q	B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFHxS	355-46-4	4.34	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
6:2 FTS	27619-97-2	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFOA	335-67-1	6.17	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFHpS	375-92-8	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFNA	375-95-1	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFOSA	754-91-6	ND	0.994		B1I0097	22-Sep-21	0.252 L	19-Oct-21 21:52	1
PFOS	1763-23-1	13.2	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFDA	335-76-2	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
8:2 FTS	39108-34-4	ND	1.02		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFNS	68259-12-1	ND	1.92		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
MeFOSAA	2355-31-9	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
EtFOSAA	2991-50-6	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFUnA	2058-94-8	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFDS	335-77-3	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFDoA	307-55-1	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFTTrDA	72629-94-8	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
PFTeDA	376-06-7	ND	0.994		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	71.1	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C3-PFPeA	IS	82.7	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C3-PFBS	IS	75.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C2-4:2 FTS	IS	97.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C2-PFHxA	IS	78.5	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C4-PFHpA	IS	80.3	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C3-PFHxS	IS	78.1	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C2-6:2 FTS	IS	78.3	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C5-PFNA	IS	72.9	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C8-PFOSA	IS	59.0	10 - 150		B1I0097	22-Sep-21	0.252 L	19-Oct-21 21:52	1
13C2-PFOA	IS	79.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C8-PFOS	IS	80.9	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1

Sample ID: 9	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 11:58	Laboratory Data Lab Sample: 2109111-07 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	83.2	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C2-8:2 FTS	IS	82.2	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
d3-MeFOSAA	IS	74.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C2-PFUnA	IS	70.7	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
d5-EtFOSAA	IS	78.4	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C2-PFDoA	IS	86.4	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1
13C2-PFTeDA	IS	70.4	20 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 00:25	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 8
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-08	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 12:18	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.77	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFPeA	2706-90-3	1.53	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFBS	375-73-5	8.07	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
4:2 FTS	757124-72-4	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFHxA	307-24-4	1.71	1.12		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFPeS	2706-91-4	ND	1.24		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFHpA	375-85-9	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFHxS	355-46-4	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
6:2 FTS	27619-97-2	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFOA	335-67-1	1.13	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFHpS	375-92-8	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFNA	375-95-1	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFOSA	754-91-6	ND	1.02		B1I0097	22-Sep-21	0.244 L	19-Oct-21 22:02	1
PFOS	1763-23-1	1.85	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFDA	335-76-2	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
8:2 FTS	39108-34-4	ND	1.05		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFNS	68259-12-1	ND	1.98		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
MeFOSAA	2355-31-9	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
EtFOSAA	2991-50-6	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFUnA	2058-94-8	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFDS	335-77-3	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFDoA	307-55-1	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFTTrDA	72629-94-8	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
PFTeDA	376-06-7	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	69.0	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C3-PFPeA	IS	76.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C3-PFBS	IS	76.4	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C2-4:2 FTS	IS	100	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C2-PFHxA	IS	77.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C4-PFHpA	IS	78.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C3-PFHxS	IS	80.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C2-6:2 FTS	IS	74.2	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C5-PFNA	IS	74.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C8-PFOSA	IS	49.1	10 - 150		B1I0097	22-Sep-21	0.244 L	19-Oct-21 22:02	1
13C2-PFOA	IS	78.3	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C8-PFOS	IS	72.8	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1

Sample ID: 8	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 12:18	Laboratory Data Lab Sample: 2109111-08 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	82.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C2-8:2 FTS	IS	69.6	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
d3-MeFOSAA	IS	72.0	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C2-PFUnA	IS	75.5	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
d5-EtFOSAA	IS	70.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C2-PFDoA	IS	73.8	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1
13C2-PFTeDA	IS	46.8	20 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 01:07	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 7
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-09	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 11:33	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	82.8	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFPeA	2706-90-3	74.6	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFBS	375-73-5	3.90	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
4:2 FTS	757124-72-4	2.67	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFHxA	307-24-4	123	1.08		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFPeS	2706-91-4	ND	1.20		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFHpA	375-85-9	66.2	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFHxS	355-46-4	1.62	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
6:2 FTS	27619-97-2	1150	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFOA	335-67-1	80.4	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFHpS	375-92-8	ND	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFNA	375-95-1	52.6	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFOSA	754-91-6	ND	0.991		B1I0097	22-Sep-21	0.252 L	19-Oct-21 22:13	1
PFOS	1763-23-1	5.52	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFDA	335-76-2	80.6	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
8:2 FTS	39108-34-4	163	1.02		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFNS	68259-12-1	ND	1.92		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
MeFOSAA	2355-31-9	ND	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
EtFOSAA	2991-50-6	ND	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFUnA	2058-94-8	18.9	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFDS	335-77-3	ND	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFDoA	307-55-1	14.6	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFTTrDA	72629-94-8	1.39	0.991		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
PFTeDA	376-06-7	1.08	0.991	Q	B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	48.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C3-PFPeA	IS	63.5	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C3-PFBS	IS	66.7	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C2-4:2 FTS	IS	70.3	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C2-PFHxA	IS	58.0	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C4-PFHpA	IS	50.3	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C3-PFHxS	IS	56.7	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C2-6:2 FTS	IS	55.4	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C5-PFNA	IS	51.4	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C8-PFOSA	IS	48.2	10 - 150		B1I0097	22-Sep-21	0.252 L	19-Oct-21 22:13	1
13C2-PFOA	IS	55.8	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C8-PFOS	IS	61.0	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1

Sample ID: 7	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Aqueous Date Collected: 09-Sep-21 11:33 Lab Sample: 2109111-09 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	68.4	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C2-8:2 FTS	IS	64.8	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
d3-MeFOSAA	IS	60.5	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C2-PFUnA	IS	62.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
d5-EtFOSAA	IS	58.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C2-PFDoA	IS	60.6	25 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1
13C2-PFTeDA	IS	49.1	20 - 150		B1I0097	22-Sep-21	0.252 L	23-Oct-21 01:28	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 2
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-10	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 11:11	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	28.5	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFPeA	2706-90-3	99.6	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFBS	375-73-5	1.99	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
4:2 FTS	757124-72-4	1.37	1.02	Q	B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFHxA	307-24-4	74.7	1.11		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFPeS	2706-91-4	ND	1.24		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFHpA	375-85-9	36.7	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFHxS	355-46-4	21.2	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
6:2 FTS	27619-97-2	93.0	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFOA	335-67-1	34.5	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFHpS	375-92-8	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFNA	375-95-1	4.58	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFOSA	754-91-6	ND	1.02		B1I0097	22-Sep-21	0.245 L	19-Oct-21 22:23	1
PFOS	1763-23-1	44.9	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFDA	335-76-2	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
8:2 FTS	39108-34-4	11.4	1.05	Q	B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFNS	68259-12-1	ND	1.98		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
MeFOSAA	2355-31-9	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
EtFOSAA	2991-50-6	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFUnA	2058-94-8	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFDS	335-77-3	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFDoA	307-55-1	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFTTrDA	72629-94-8	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
PFTeDA	376-06-7	ND	1.02		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	77.6	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C3-PFPeA	IS	86.4	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C3-PFBS	IS	89.0	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C2-4:2 FTS	IS	113	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C2-PFHxA	IS	90.4	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C4-PFHpA	IS	98.2	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C3-PFHxS	IS	88.8	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C2-6:2 FTS	IS	76.7	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C5-PFNA	IS	90.0	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C8-PFOSA	IS	53.7	10 - 150		B1I0097	22-Sep-21	0.245 L	19-Oct-21 22:23	1
13C2-PFOA	IS	93.1	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C8-PFOS	IS	86.8	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1

Sample ID: 2	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 11:11	Laboratory Data Lab Sample: 2109111-10 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	91.3	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C2-8:2 FTS	IS	77.3	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
d3-MeFOSAA	IS	75.7	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C2-PFUnA	IS	88.5	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
d5-EtFOSAA	IS	83.7	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C2-PFDoA	IS	87.1	25 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1
13C2-PFTeDA	IS	83.7	20 - 150		B1I0097	22-Sep-21	0.245 L	23-Oct-21 01:49	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 1 ES
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-11	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 09:55	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	13.2	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFPeA	2706-90-3	29.3	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFBS	375-73-5	4.03	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
4:2 FTS	757124-72-4	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFHxA	307-24-4	27.7	1.10		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFPeS	2706-91-4	2.65	1.22		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFHpA	375-85-9	24.1	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFHxS	355-46-4	28.0	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
6:2 FTS	27619-97-2	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFOA	335-67-1	38.8	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFHpS	375-92-8	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFNA	375-95-1	6.70	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFOSA	754-91-6	ND	1.01		B1I0097	22-Sep-21	0.248 L	19-Oct-21 22:34	1
PFOS	1763-23-1	26.5	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFDA	335-76-2	2.03	1.01	Q	B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
8:2 FTS	39108-34-4	ND	1.04		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFNS	68259-12-1	ND	1.95		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
MeFOSAA	2355-31-9	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
EtFOSAA	2991-50-6	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFUnA	2058-94-8	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFDS	335-77-3	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFDoA	307-55-1	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFTTrDA	72629-94-8	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
PFTeDA	376-06-7	ND	1.01		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	74.1	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C3-PFPeA	IS	79.2	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C3-PFBS	IS	79.1	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C2-4:2 FTS	IS	113	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C2-PFHxA	IS	77.9	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C4-PFHpA	IS	75.9	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C3-PFHxS	IS	76.5	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C2-6:2 FTS	IS	70.2	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C5-PFNA	IS	68.9	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C8-PFOSA	IS	24.8	10 - 150		B1I0097	22-Sep-21	0.248 L	19-Oct-21 22:34	1
13C2-PFOA	IS	75.8	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C8-PFOS	IS	75.6	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1

Sample ID: 1 ES	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Aqueous Date Collected: 09-Sep-21 09:55 Lab Sample: 2109111-11 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	75.6	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C2-8:2 FTS	IS	77.2	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
d3-MeFOSAA	IS	71.5	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C2-PFUnA	IS	73.7	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
d5-EtFOSAA	IS	66.1	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C2-PFDoA	IS	80.1	25 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1
13C2-PFTeDA	IS	61.5	20 - 150		B1I0097	22-Sep-21	0.248 L	23-Oct-21 02:00	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: OF-1N-NW
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-12	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 10:47	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	80.1	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFPeA	2706-90-3	312	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFBS	375-73-5	17.6	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
4:2 FTS	757124-72-4	3.39	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFHxA	307-24-4	297	1.10		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFPeS	2706-91-4	25.6	1.22		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFHpA	375-85-9	97.9	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFHxS	355-46-4	193	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
6:2 FTS	27619-97-2	1490	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFOA	335-67-1	241	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFHpS	375-92-8	4.42	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFNA	375-95-1	16.5	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFOSA	754-91-6	ND	1.01		B1I0097	22-Sep-21	0.249 L	19-Oct-21 22:44	1
PFOS	1763-23-1	433	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFDA	335-76-2	1.14	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
8:2 FTS	39108-34-4	26.2	1.04		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFNS	68259-12-1	ND	1.95		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
MeFOSAA	2355-31-9	ND	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
EtFOSAA	2991-50-6	ND	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFUnA	2058-94-8	ND	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFDS	335-77-3	ND	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFDoA	307-55-1	ND	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFTTrDA	72629-94-8	ND	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
PFTeDA	376-06-7	ND	1.01		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	65.5	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C3-PFPeA	IS	76.6	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C3-PFBS	IS	72.6	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C2-4:2 FTS	IS	107	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C2-PFHxA	IS	76.9	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C4-PFHpA	IS	76.3	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C3-PFHxS	IS	77.7	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C2-6:2 FTS	IS	54.6	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C5-PFNA	IS	69.6	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C8-PFOSA	IS	51.0	10 - 150		B1I0097	22-Sep-21	0.249 L	19-Oct-21 22:44	1
13C2-PFOA	IS	75.0	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1
13C8-PFOS	IS	80.3	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1

Sample ID: OF-1N-NW					PFAS Isotope Dilution Method					
Client Data					Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Aqueous		Lab Sample:	2109111-12	Column:	BEH C18		
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 10:47		Date Received:	11-Sep-21 10:40				
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	71.0	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1	
13C2-8:2 FTS	IS	70.2	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1	
d3-MeFOSAA	IS	75.5	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1	
13C2-PFUnA	IS	70.9	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1	
d5-EtFOSAA	IS	73.8	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1	
13C2-PFDoA	IS	78.2	25 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1	
13C2-PFTeDA	IS	59.1	20 - 150		B1I0097	22-Sep-21	0.249 L	23-Oct-21 02:10	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: 6-DUP
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-13	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 13:45	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	24.2	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFPeA	2706-90-3	75.5	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFBS	375-73-5	20.0	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
4:2 FTS	757124-72-4	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFHxA	307-24-4	74.3	1.12		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFPeS	2706-91-4	17.5	1.24		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFHpA	375-85-9	30.8	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFHxS	355-46-4	117	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
6:2 FTS	27619-97-2	34.4	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFOA	335-67-1	79.5	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFHpS	375-92-8	4.69	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFNA	375-95-1	6.17	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFOSA	754-91-6	ND	1.02		B1I0097	22-Sep-21	0.244 L	19-Oct-21 23:27	1
PFOS	1763-23-1	229	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFDA	335-76-2	4.90	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
8:2 FTS	39108-34-4	ND	1.05		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFNS	68259-12-1	ND	1.98		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
MeFOSAA	2355-31-9	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
EtFOSAA	2991-50-6	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFUnA	2058-94-8	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFDS	335-77-3	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFDoA	307-55-1	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFTTrDA	72629-94-8	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
PFTeDA	376-06-7	ND	1.02		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	79.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C3-PFPeA	IS	85.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C3-PFBS	IS	89.6	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C2-4:2 FTS	IS	123	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C2-PFHxA	IS	87.3	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C4-PFHpA	IS	84.2	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C3-PFHxS	IS	86.8	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C2-6:2 FTS	IS	89.4	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C5-PFNA	IS	81.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C8-PFOSA	IS	39.9	10 - 150		B1I0097	22-Sep-21	0.244 L	19-Oct-21 23:27	1
13C2-PFOA	IS	88.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1
13C8-PFOS	IS	83.8	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1

Sample ID: 6-DUP					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Aqueous Date Collected: 09-Sep-21 13:45					Laboratory Data Lab Sample: 2109111-13 Date Received: 11-Sep-21 10:40 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	93.5	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1	
13C2-8:2 FTS	IS	85.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1	
d3-MeFOSAA	IS	78.3	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1	
13C2-PFUnA	IS	84.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1	
d5-EtFOSAA	IS	66.8	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1	
13C2-PFDoA	IS	78.3	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1	
13C2-PFTeDA	IS	75.3	20 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 02:21	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: FB
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-14	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 12:50	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFPeA	2706-90-3	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFBS	375-73-5	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
4:2 FTS	757124-72-4	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFHxA	307-24-4	ND	1.06		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFPeS	2706-91-4	ND	1.18		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFHpA	375-85-9	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFHxS	355-46-4	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
6:2 FTS	27619-97-2	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFOA	335-67-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFHpS	375-92-8	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFNA	375-95-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFOSA	754-91-6	ND	0.977		B1I0097	22-Sep-21	0.256 L	19-Oct-21 23:37	1
PFOS	1763-23-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFDA	335-76-2	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
8:2 FTS	39108-34-4	ND	1.01		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFNS	68259-12-1	ND	1.89		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
MeFOSAA	2355-31-9	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
EtFOSAA	2991-50-6	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFUnA	2058-94-8	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFDS	335-77-3	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFDoA	307-55-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFTTrDA	72629-94-8	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
PFTeDA	376-06-7	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	74.7	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C3-PFPeA	IS	78.9	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C3-PFBS	IS	80.6	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C2-4:2 FTS	IS	105	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C2-PFHxA	IS	80.0	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C4-PFHpA	IS	79.9	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C3-PFHxS	IS	87.4	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C2-6:2 FTS	IS	77.0	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C5-PFNA	IS	75.0	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C8-PFOSA	IS	39.1	10 - 150		B1I0097	22-Sep-21	0.256 L	19-Oct-21 23:37	1
13C2-PFOA	IS	80.3	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1
13C8-PFOS	IS	83.8	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1

Sample ID: FB					PFAS Isotope Dilution Method					
Client Data					Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Aqueous		Lab Sample:	2109111-14	Column:	BEH C18		
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 12:50		Date Received:	11-Sep-21 10:40				
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	75.2	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1	
13C2-8:2 FTS	IS	78.2	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1	
d3-MeFOSAA	IS	65.3	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1	
13C2-PFUnA	IS	79.6	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1	
d5-EtFOSAA	IS	58.2	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1	
13C2-PFDoA	IS	80.9	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1	
13C2-PFTeDA	IS	74.8	20 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:32	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: EB
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-15	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 12:55	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFPeA	2706-90-3	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFBS	375-73-5	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
4:2 FTS	757124-72-4	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFHxA	307-24-4	ND	1.06		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFPeS	2706-91-4	ND	1.18		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFHpA	375-85-9	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFHxS	355-46-4	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
6:2 FTS	27619-97-2	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFOA	335-67-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFHpS	375-92-8	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFNA	375-95-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFOSA	754-91-6	ND	0.977		B1I0097	22-Sep-21	0.256 L	19-Oct-21 23:48	1
PFOS	1763-23-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFDA	335-76-2	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
8:2 FTS	39108-34-4	ND	1.01		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFNS	68259-12-1	ND	1.89		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
MeFOSAA	2355-31-9	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
EtFOSAA	2991-50-6	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFUnA	2058-94-8	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFDS	335-77-3	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFDoA	307-55-1	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFTTrDA	72629-94-8	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
PFTeDA	376-06-7	ND	0.977		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	81.8	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C3-PFPeA	IS	80.3	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C3-PFBS	IS	83.9	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C2-4:2 FTS	IS	107	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C2-PFHxA	IS	83.9	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C4-PFHpA	IS	85.9	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C3-PFHxS	IS	93.0	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C2-6:2 FTS	IS	78.5	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C5-PFNA	IS	76.2	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C8-PFOSA	IS	47.4	10 - 150		B1I0097	22-Sep-21	0.256 L	19-Oct-21 23:48	1
13C2-PFOA	IS	89.5	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C8-PFOS	IS	93.8	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1

Sample ID: EB	PFAS Isotope Dilution Method
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Client Data	Laboratory Data
Name: Apex Companies, LLC Project: PDX Fire Training Facility	Matrix: Aqueous Date Collected: 09-Sep-21 12:55 Lab Sample: 2109111-15 Date Received: 11-Sep-21 10:40 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	81.1	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C2-8:2 FTS	IS	81.3	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
d3-MeFOSAA	IS	74.5	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C2-PFUnA	IS	86.4	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
d5-EtFOSAA	IS	74.2	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C2-PFDoA	IS	80.1	25 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1
13C2-PFTeDA	IS	70.3	20 - 150		B1I0097	22-Sep-21	0.256 L	23-Oct-21 02:42	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 1E
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-16	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 10:07	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	4.97	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFPeA	2706-90-3	8.03	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFBS	375-73-5	3.55	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
4:2 FTS	757124-72-4	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFHxA	307-24-4	5.76	1.11		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFPeS	2706-91-4	1.60	1.23		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFHpA	375-85-9	5.08	1.02	Q	B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFHxS	355-46-4	7.82	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
6:2 FTS	27619-97-2	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFOA	335-67-1	7.69	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFHpS	375-92-8	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFNA	375-95-1	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFOSA	754-91-6	ND	1.02		B1I0097	22-Sep-21	0.246 L	19-Oct-21 23:58	1
PFOS	1763-23-1	5.37	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFDA	335-76-2	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
8:2 FTS	39108-34-4	ND	1.05		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFNS	68259-12-1	ND	1.97		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
MeFOSAA	2355-31-9	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
EtFOSAA	2991-50-6	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFUnA	2058-94-8	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFDS	335-77-3	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFDoA	307-55-1	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFTTrDA	72629-94-8	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
PFTeDA	376-06-7	ND	1.02		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	80.1	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C3-PFPeA	IS	85.5	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C3-PFBS	IS	84.4	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C2-4:2 FTS	IS	112	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C2-PFHxA	IS	83.1	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C4-PFHpA	IS	86.0	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C3-PFHxS	IS	83.0	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C2-6:2 FTS	IS	79.7	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C5-PFNA	IS	73.8	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C8-PFOSA	IS	57.2	10 - 150		B1I0097	22-Sep-21	0.246 L	19-Oct-21 23:58	1
13C2-PFOA	IS	78.8	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C8-PFOS	IS	86.7	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1

Sample ID: 1E	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Lab Sample: 2109111-16 Date Received: 11-Sep-21 10:40 Matrix: Aqueous Date Collected: 09-Sep-21 10:07 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	81.3	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C2-8:2 FTS	IS	65.4	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
d3-MeFOSAA	IS	75.3	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C2-PFUnA	IS	75.0	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
d5-EtFOSAA	IS	76.9	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C2-PFDoA	IS	74.1	25 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1
13C2-PFTeDA	IS	75.2	20 - 150		B1I0097	22-Sep-21	0.246 L	23-Oct-21 02:53	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 1S
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	2109111-17	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	09-Sep-21 10:25	Date Received:	11-Sep-21 10:40		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	12.0	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFPeA	2706-90-3	25.3	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFBS	375-73-5	2.52	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
4:2 FTS	757124-72-4	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFHxA	307-24-4	26.0	1.12		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFPeS	2706-91-4	1.94	1.24		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFHpA	375-85-9	23.5	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFHxS	355-46-4	30.1	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
6:2 FTS	27619-97-2	6.12	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFOA	335-67-1	39.4	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFHpS	375-92-8	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFNA	375-95-1	7.14	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFOSA	754-91-6	ND	1.03		B1I0097	22-Sep-21	0.244 L	20-Oct-21 00:09	1
PFOS	1763-23-1	50.4	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFDA	335-76-2	1.75	1.03	Q	B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
8:2 FTS	39108-34-4	3.88	1.06		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFNS	68259-12-1	ND	1.98		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
MeFOSAA	2355-31-9	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
EtFOSAA	2991-50-6	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFUnA	2058-94-8	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFDS	335-77-3	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFDoA	307-55-1	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFTTrDA	72629-94-8	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
PFTeDA	376-06-7	ND	1.03		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	74.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C3-PFPeA	IS	80.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C3-PFBS	IS	82.3	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C2-4:2 FTS	IS	79.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C2-PFHxA	IS	76.7	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C4-PFHpA	IS	81.2	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C3-PFHxS	IS	79.1	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C2-6:2 FTS	IS	80.7	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C5-PFNA	IS	69.6	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C8-PFOSA	IS	53.5	10 - 150		B1I0097	22-Sep-21	0.244 L	20-Oct-21 00:09	1
13C2-PFOA	IS	81.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C8-PFOS	IS	82.4	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1

Sample ID: 1S	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Aqueous Date Collected: 09-Sep-21 10:25 Lab Sample: 2109111-17 Date Received: 11-Sep-21 10:40 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	83.6	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C2-8:2 FTS	IS	64.9	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
d3-MeFOSAA	IS	75.8	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C2-PFUnA	IS	77.5	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
d5-EtFOSAA	IS	79.8	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C2-PFDoA	IS	76.2	25 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1
13C2-PFTeDA	IS	70.1	20 - 150		B1I0097	22-Sep-21	0.244 L	23-Oct-21 03:03	1

RL - Reporting limit

Results reported to RL.

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

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection Limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
MDL	Method Detection Limit
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
RL	For 537.1, the reported RLs are the MRLs.
TEQ	Toxic Equivalency, sum of the toxic equivalency factors (TEF) multiplied by the sample concentrations.
TEQMax	TEQ calculation that uses the detection limit as the concentration for non-detects
TEQMin	TEQ calculation that uses zero as the concentration for non-detects
TEQRisk	TEQ calculation that uses ½ the detection limit as the concentration for non-detects
U	Not Detected (specific projects only)
*	See Cover Letter

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

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	21-023-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-26
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2020018
Massachusetts Department of Environmental Protection	M-CA413
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1980678
New Hampshire Environmental Accreditation Program	207720
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Ohio Environmental Protection Agency	87778
Oregon Laboratory Accreditation Program	4042-016
Pennsylvania Department of Environmental Protection	017
Texas Commission on Environmental Quality	T104704189-21-12
Vermont Department of Health	VT-4042
Virginia Department of General Services	10769
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

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

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p- Dioxins & Polychlorinated Dibenzofurans	EPA 23
Polychlorinated Dibenzodioxins in Ambient Air by GC/HRMS	EPA TO-9A

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

MATRIX: Drinking Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613/1613B
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537.1
Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry	EPA 533
Perfluorooctanesulfonate (PFOS) and Perfluorooctanoate (PFOA) - Method for Unfiltered Samples Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry	ISO 25101 2009

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

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

CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: 2109111 Temp: 3.6 °C
Storage ID: P-13, WR-2 Storage Secured: Yes ☐ No ☐

Project ID: PDX Fire Training Facility PO#: 2550-00 Sampler: M. Masterson/C. Clough/R. Schettler
(name)

TAT Standard: ☒ 21 days
(check one): Rush (surcharge may apply)
☐ 14 days ☐ 7 days Specify: _____

Invoice to: Name Company Address City State Ph# Fax#
Heather Gosack Apex Companies 3015 SW 1st Ave Portland OR 503-924-4704

Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time
Robert Schettler [Signature] 09/10/21 10:14 Justin Briseno [Signature] 09/11/21 1040
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

Method of Shipment: _____

ATTN: _____

Tracking No.: _____

Add Analysis(es) Requested

Container(s)

Mod. EPA
Method 537

EPA Method
537(DW only)

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	ACOMA Gen-X F53-8	TOP Assay	537 List: 24	Full List of 26	Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List 8	PFAS List 14	Comments
SW-3	9/9/21	1432		2	P	AQ			X						
SW-2	9/9/21	1410		2	P	AQ			X						
5	9/9/21	1311		2	P	AQ			X						
3	9/9/21	1345		2	P	AQ			X						
4	9/9/21	1328		2	P	AQ			X						
6	9/9/21	1245		2	P	AQ			X						
9	9/9/21	1158		2	P	AQ			X						
8	9/9/21	1218		2	P	AQ			X						
7	9/9/21	1133		2	P	AQ			X						
2	9/9/21	1111		2	P	AQ			X						

Special Instructions/Comments: _____

SEND
DOCUMENTATION
AND RESULTS TO:

Name: Heather Gosack and Kelsi Evans
Company: see above
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____
Email: Heather.Gosack@apexc.com; kelsi.evans@apexc.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma: _____

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

CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: 2109111 Temp: 3.6 °C
Storage ID: 12-12, 02-2 Storage Secured: Yes ☒ No ☐

Project ID: PDX Fire Training Facility PO#: 2550-00 Sampler: M. Masterson/C. Clough/R. Schettler
(name)

TAT Standard: ☒ 21 days
(check one): Rush (surcharge may apply)
☐ 14 days ☐ 7 days Specify: _____

Invoice to: Name Company Address City State Ph# Fax#
Heather Gosack Apex Companies 3015 SW 1st Ave Portland OR 503-924-4704

Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time
Robert Schettler [Signature] 07/10/21 10:14 Justin Briseno [Signature] 09/11/21 1040
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

Method of Shipment: _____

ATTN: _____

Tracking No.: _____

Add Analysis(es) Requested

Container(s)

Mod. EPA
Method 537

EPA Method
537(DW only)

Sample ID	Date	Time	Location/Sample Description	Quantity	Type	Matrix	ADONA Gen-X, F53-B	TOP Assay	537 List: 24	Full List of 26	Other: Please List Below	PFOA/PFOS	UCMR3 PFAS List: 6	PFAS List: 14	Comments
1 ES	9/9/21	0955		2	P	AQ			X						
OF-1N-NW	9/9/21	1047		2	P	AQ			X						
6-DUP	9/9/21	1345		2	P	AQ			X						
FB	9/9/21	1250		2	P	AQ			X						
EB	9/9/21	1255		2	P	AQ			X						
1E	9/9/21	1007		2	P	AQ			X						
1S	9/9/21	1025		2	P	AQ			X						

Special Instructions/Comments: _____

SEND
DOCUMENTATION
AND RESULTS TO:

Name: Heather Gosack and Kelsi Evans
Company: see above
Address: _____
City: _____ State: _____ Zip: _____
Phone: _____ Fax: _____
Email: Heather.Gosack@apexcos.com; kelsi.evans@apexcos.com

Container Types: P= HDPE, PJ= HDPE Jar
O = Other: _____

Bottle Preservation Type: T = Thiosulfate,
TZ = Trizma: _____

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

Sample Log-In Checklist

 Page # 1 of 1

 Vista Work Order #: 2109111 TAT 542

Samples Arrival:	Date/Time <u>09/11/21</u> <u>1040</u>	Initials: <u>[Signature]</u>	Location: <u>WR-2</u>
			Shelf/Rack: <u>N/A</u>
Delivered By:	<u>FedEx</u> UPS On Trac GLS DHL Hand Delivered Other		
Preservation:	<u>Ice</u> Blue Ice Techni Ice Dry Ice None		
Temp °C: <u>3.7</u> (uncorrected)	Probe used: Y / <u>N</u>		Thermometer ID: <u>TP-3</u>
Temp °C: <u>3.6</u> (corrected)			

	YES	NO	NA
Shipping Container(s) Intact?	☒		
Shipping Custody Seals Intact?		☒	☒
Airbill <u>—</u> Trk # <u>7747 6935 3830</u>	☒		
Shipping Documentation Present?	☒		
Shipping Container <u>Vista</u> Client <u>Retain</u> Return Dispose			
Chain of Custody / Sample Documentation Present?	☒		
Chain of Custody / Sample Documentation Complete?	☒		
Holding Time Acceptable?			

Logged In:	Date/Time <u>09/11/21</u> <u>09:52</u>	Initials: <u>[Signature]</u>	Location: <u>R-13, WR-2</u>
			Shelf/Rack: <u>A-4 R-5</u>
COC Anomaly/Sample Acceptance Form completed?			☒

Comments:

CoC/Label Reconciliation Report WO# 2109111

LabNumber	CoC Sample ID	SampleAlias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2109111-01	A SW-3	☒	09-Sep-21 14:32 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-01	B SW-3	☒	09-Sep-21 14:32 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-02	A SW-2	☒	09-Sep-21 14:10 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-02	B SW-2	☒	09-Sep-21 14:10 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-03	A 5	☒	09-Sep-21 13:11 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-03	B 5	☒	09-Sep-21 13:11 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-04	A 3	☒	09-Sep-21 13:45 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-04	B 3	☒	09-Sep-21 13:45 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-05	A 4	☒	09-Sep-21 13:28 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-05	B 4	☒	09-Sep-21 13:28 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-06	A 6	☒	09-Sep-21 12:45 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-06	B 6	☒	09-Sep-21 12:45 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-07	A 9	☒	09-Sep-21 11:58 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-07	B 9	☒	09-Sep-21 11:58 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-08	A 8	☒	09-Sep-21 12:18 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-08	B 8	☒	09-Sep-21 12:18 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-09	A 7	☒	09-Sep-21 11:33 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-09	B 7	☒	09-Sep-21 11:33 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-10	A 2	☒	09-Sep-21 11:11 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-10	B 2	☒	09-Sep-21 11:11 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-11	A 1 ES	☒	09-Sep-21 09:55 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-11	B 1 ES	☒	09-Sep-21 09:55 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-12	A OF-IN-NW	☒	09-Sep-21 10:47 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-12	B OF-IN-NW	☒	09-Sep-21 10:47 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-13	A 6-DUP	☒	09-Sep-21 13:45 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-13	B 6-DUP	☒	09-Sep-21 13:45 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-14	A FB	☒	09-Sep-21 12:50 ☒	HDPE Bottle, 250 mL	Aqueous	
2109111-14	B FB	☒	09-Sep-21 12:50 ☒	HDPE Bottle, 250 mL	Aqueous	

2109111-15	A	EB	☒	09-Sep-21 12:55	☒	HDPE Bottle, 250 mL	Aqueous
2109111-15	B	EB	☒	09-Sep-21 12:55	☒	HDPE Bottle, 250 mL	Aqueous
2109111-16	A	IE	☒	09-Sep-21 10:07	☒	HDPE Bottle, 250 mL	Aqueous
2109111-16	B	IE	☒	09-Sep-21 10:07	☒	HDPE Bottle, 250 mL	Aqueous
2109111-17	A	IS	☒	09-Sep-21 10:25	☒	HDPE Bottle, 250 mL	Aqueous
2109111-17	B	IS	☒	09-Sep-21 10:25	☒	HDPE Bottle, 250 mL	Aqueous

Checkmarks indicate that information on the COC reconciled with the sample label.
Any discrepancies are noted in the following columns.

	Yes	No	NA	Comments:
Sample Container Intact?	☒	☐	☐	
Sample Custody Seals Intact?	☐	☐	☒	
Adequate Sample Volume?	☒	☐	☐	
Container Type Appropriate for Analysis(es)	☒	☐	☐	

Preservation Documented: Na2S2O3 Trizma NH4CH3CO2 None Other

Verified by/Date: VA 09/14/21



January 26, 2022

Vista Work Order No. 2112121

Ms. Heather Gosack
Apex Companies, LLC
3015 SW First Avenue
Portland, OR 97201

Dear Ms. Gosack,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on December 16, 2021 under your Project Name 'PDX Fire Training Facility'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at jfox@vista-analytical.com.

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

Sincerely,

Jamie Fox
Laboratory Director



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

Vista Work Order No. 2112121

Case Narrative

Sample Condition on Receipt:

Nineteen stormwater samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The samples were received in good condition and within the recommended temperature requirements. A relinquishing signature was not included on the Chain-of-Custody (CoC). The collection times for samples "SW-3" and "EQ" were listed as "10:30" and "10:40" on their respective container labels. This report was amended to update the results for samples "OFIN-NW_dissolved", "6_dissolved" and "SW-2_dissolved".

Analytical Notes:

PFAS Isotope Dilution Method

The following samples contained particulate and were centrifuged prior to extraction. The solid fractions for samples "OFIN-NW_dissolved", "6_dissolved", and "SW-2_dissolved" were not rinsed following centrifugation and decanting, per client instructions.

<u>Laboratory ID</u>	<u>Sample Name</u>
2112121-03	OFIN-NW_dissolved
2112121-06	2
2112121-07	7
2112121-12	6
2112121-13	6_dissolved
2112121-14	5
2112121-15	4
2112121-18	SW-2_dissolved

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

Holding Times

The samples were extracted and analyzed within the hold times. Samples "OFIN-NW_dissolved", "6_dissolved" and "SW-2_dissolved" were re-extracted outside of the hold time.

Quality Control

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

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

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

TABLE OF CONTENTS

Case Narrative.....	1
Table of Contents.....	4
Sample Inventory.....	5
Analytical Results.....	6
Qualifiers.....	53
Certifications.....	54
Sample Receipt.....	57

Sample Inventory Report



Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2112121-01	Basin-B	15-Dec-21 08:47	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-02	OFIN-NW	15-Dec-21 09:13	16-Dec-21 12:58	HDPE Bottle, 250 mL
2112121-03	OFIN-NW_dissolved	15-Dec-21 09:13	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-04	DUP-1	15-Dec-21 09:13	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-05	IES	15-Dec-21 09:36	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-06	2	15-Dec-21 09:51	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-07	7	15-Dec-21 10:09	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-08	SW-3	15-Dec-21 11:30	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-09	EQ	15-Dec-21 11:40	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-10	9	15-Dec-21 08:35	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-11	8	15-Dec-21 08:52	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-12	6	15-Dec-21 09:12	16-Dec-21 12:58	HDPE Bottle, 250 mL
2112121-13	6_dissolved	15-Dec-21 09:12	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-14	5	15-Dec-21 09:36	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-15	4	15-Dec-21 09:50	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-16	3	15-Dec-21 10:08	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-17	SW-2	15-Dec-21 10:35	16-Dec-21 12:58	HDPE Bottle, 250 mL
2112121-18	SW-2_dissolved	15-Dec-21 10:35	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
2112121-19	FB-1	15-Dec-21 10:42	16-Dec-21 12:58	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

Vista Project: 2112121

Client Project: PDX Fire Training Facility

ANALYTICAL RESULTS

Sample ID: Method Blank
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	B1L0179-BLK1	Column:	BEH C18
Project:	PDX Fire Training Facility						

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFPeA	2706-90-3	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFBS	375-73-5	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
4:2 FTS	757124-72-4	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFHxA	307-24-4	ND	1.09		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFPeS	2706-91-4	ND	1.21		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFHpA	375-85-9	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFHxS	355-46-4	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
6:2 FTS	27619-97-2	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFOA	335-67-1	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFHpS	375-92-8	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFNA	375-95-1	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFOSA	754-91-6	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFOS	1763-23-1	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFDA	335-76-2	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
8:2 FTS	39108-34-4	ND	1.03		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFNS	68259-12-1	ND	1.94		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
MeFOSAA	2355-31-9	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
EtFOSAA	2991-50-6	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFA	2058-94-8	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFDS	335-77-3	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFDoA	307-55-1	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFTTrDA	72629-94-8	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
PFTeDA	376-06-7	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.8	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C3-PFPeA	IS	105	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C3-PFBS	IS	106	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C2-4:2 FTS	IS	115	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C2-PFHxA	IS	99.9	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C4-PFHpA	IS	103	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C3-PFHxS	IS	101	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C2-6:2 FTS	IS	95.7	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C5-PFNA	IS	117	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C8-PFOA	IS	32.1	10 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C2-PFOA	IS	107	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C8-PFOS	IS	95.5	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1
13C2-PFDA	IS	103	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1

Sample ID: Method Blank					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility					Laboratory Data Lab Sample: B1L0179-BLK1 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-8:2 FTS	IS	88.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1	
d3-MeFOSAA	IS	95.2	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1	
13C2-PFUnA	IS	91.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1	
d5-EtFOSAA	IS	71.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1	
13C2-PFDoA	IS	78.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1	
13C2-PFTeDA	IS	69.5	20 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:44	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: OPR
PFAS Isotope Dilution Method

Client Data						Laboratory Data					
Name:	Apex Companies, LLC		Matrix:	Aqueous		Lab Sample:	B1L0179-BS1		Column:	BEH C18	
Project:	PDX Fire Training Facility										
Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	38.4	40.0	96.0	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFPeA	2706-90-3	39.4	40.0	98.4	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFBS	375-73-5	38.2	40.0	95.5	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
4:2 FTS	757124-72-4	42.8	40.0	107	60 - 145		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFHxA	307-24-4	40.0	40.0	100	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFPeS	2706-91-4	36.5	40.0	91.3	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFHpA	375-85-9	37.4	40.0	93.5	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFHxS	355-46-4	38.2	40.0	95.5	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
6:2 FTS	27619-97-2	34.1	40.0	85.3	60 - 140		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFOA	335-67-1	38.0	40.0	95.0	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFHpS	375-92-8	40.3	40.0	101	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFNA	375-95-1	37.9	40.0	94.7	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFOSA	754-91-6	41.5	40.0	104	65 - 140		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFOS	1763-23-1	39.4	40.0	98.4	65 - 140		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFDA	335-76-2	41.7	40.0	104	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
8:2 FTS	39108-34-4	46.6	40.0	117	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFNS	68259-12-1	38.1	40.0	95.2	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
MeFOSAA	2355-31-9	38.4	40.0	96.0	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
EtFOSAA	2991-50-6	44.4	40.0	111	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFUnA	2058-94-8	43.8	40.0	109	65 - 140		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFDS	335-77-3	35.9	40.0	89.9	50 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFDaA	307-55-1	37.8	40.0	94.6	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFTTrDA	72629-94-8	34.3	40.0	85.8	60 - 140		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
PFTeDA	376-06-7	43.5	40.0	109	65 - 135		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
Labeled Standards	Type			% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS			101	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C3-PFPeA	IS			107	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C3-PFBS	IS			107	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-4:2 FTS	IS			99.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-PFHxA	IS			108	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C4-PFHpA	IS			107	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C3-PFHxS	IS			103	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-6:2 FTS	IS			97.7	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C5-PFNA	IS			129	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C8-PFOSA	IS			42.3	10 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1

Sample ID: OPR
PFAS Isotope Dilution Method

Client Data				Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	B1L0179-BS1	Column:	BEH C18		
Project:	PDX Fire Training Facility								
Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFOA	IS	114	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C8-PFOS	IS	106	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-PFDA	IS	107	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-8:2 FTS	IS	95.9	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
d3-MeFOSAA	IS	115	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-PFUnA	IS	104	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
d5-EtFOSAA	IS	73.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-PFDoA	IS	87.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1
13C2-PFTeDA	IS	87.5	20 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 20:54	1

Sample ID: Method Blank
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	B22A106-BLK1	Column:	BEH C18
Project:	PDX Fire Training Facility						

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFPeA	2706-90-3	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFBS	375-73-5	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
4:2 FTS	757124-72-4	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFHxA	307-24-4	ND	1.09		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFPeS	2706-91-4	ND	1.21		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFHpA	375-85-9	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFHxS	355-46-4	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
6:2 FTS	27619-97-2	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFOA	335-67-1	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFHpS	375-92-8	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFNA	375-95-1	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFOSA	754-91-6	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFOS	1763-23-1	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFDA	335-76-2	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
8:2 FTS	39108-34-4	ND	1.03		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFNS	68259-12-1	ND	1.94		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
MeFOSAA	2355-31-9	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
EtFOSAA	2991-50-6	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFAUnA	2058-94-8	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFDS	335-77-3	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFDoA	307-55-1	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFTTrDA	72629-94-8	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
PFTeDA	376-06-7	ND	1.00		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	82.2	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C3-PFPeA	IS	86.7	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C3-PFBS	IS	91.9	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C2-4:2 FTS	IS	116	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C2-PFHxA	IS	93.0	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C4-PFHpA	IS	91.1	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C3-PFHxS	IS	92.7	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C2-6:2 FTS	IS	87.9	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C5-PFNA	IS	94.3	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C8-PFOSA	IS	27.8	10 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C2-PFOA	IS	94.7	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C8-PFOS	IS	97.4	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1
13C2-PFDA	IS	106	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1

Sample ID: Method Blank					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility					Laboratory Data Lab Sample: B22A106-BLK1 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-8:2 FTS	IS	89.9	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1	
d3-MeFOSAA	IS	79.8	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1	
13C2-PFUnA	IS	87.9	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1	
d5-EtFOSAA	IS	81.3	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1	
13C2-PFDoA	IS	77.7	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1	
13C2-PFTeDA	IS	75.9	20 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:30	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: OPR
PFAS Isotope Dilution Method

Client Data						Laboratory Data					
Name:	Apex Companies, LLC		Matrix:	Aqueous		Lab Sample:	B22A106-BS1		Column:	BEH C18	
Project:	PDX Fire Training Facility										
Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	39.8	40.0	99.6	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFPeA	2706-90-3	43.0	40.0	107	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFBS	375-73-5	36.5	40.0	91.2	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
4:2 FTS	757124-72-4	40.8	40.0	102	60 - 145		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFHxA	307-24-4	40.7	40.0	102	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFPeS	2706-91-4	33.9	40.0	84.8	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFHpA	375-85-9	42.2	40.0	105	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFHxS	355-46-4	40.2	40.0	100	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
6:2 FTS	27619-97-2	43.6	40.0	109	60 - 140		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFOA	335-67-1	42.1	40.0	105	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFHpS	375-92-8	39.8	40.0	99.6	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFNA	375-95-1	41.8	40.0	104	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFOSA	754-91-6	40.7	40.0	102	65 - 140		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFOS	1763-23-1	39.4	40.0	98.5	65 - 140		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFDA	335-76-2	39.3	40.0	98.1	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
8:2 FTS	39108-34-4	44.4	40.0	111	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFNS	68259-12-1	39.6	40.0	98.9	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
MeFOSAA	2355-31-9	41.6	40.0	104	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
EtFOSAA	2991-50-6	40.6	40.0	102	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFUnA	2058-94-8	40.3	40.0	101	65 - 140		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFDS	335-77-3	36.9	40.0	92.2	50 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFDaA	307-55-1	44.7	40.0	112	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFTTrDA	72629-94-8	43.6	40.0	109	60 - 140		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
PFTeDA	376-06-7	46.6	40.0	116	65 - 135		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
Labeled Standards	Type			% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS			86.7	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C3-PFPeA	IS			89.3	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C3-PFBS	IS			91.0	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-4:2 FTS	IS			109	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-PFHxA	IS			93.5	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C4-PFHpA	IS			90.5	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C3-PFHxS	IS			92.4	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-6:2 FTS	IS			82.0	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C5-PFNA	IS			93.0	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C8-PFOSA	IS			32.7	10 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1

Sample ID: OPR
PFAS Isotope Dilution Method

Client Data				Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Aqueous	Lab Sample:	B22A106-BS1	Column:	BEH C18		
Project:	PDX Fire Training Facility								
Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFOA	IS	93.4	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C8-PFOS	IS	105	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-PFDA	IS	107	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-8:2 FTS	IS	86.9	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
d3-MeFOSAA	IS	80.3	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-PFUnA	IS	92.2	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
d5-EtFOSAA	IS	75.0	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-PFDoA	IS	71.7	25 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1
13C2-PFTeDA	IS	74.2	20 - 150		B22A106	20-Jan-22	0.250 L	22-Jan-22 01:40	1

Sample ID: Basin-B
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-01	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 08:47	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.63	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFPeA	2706-90-3	2.99	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFBS	375-73-5	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
4:2 FTS	757124-72-4	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFHxA	307-24-4	1.96	1.11		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFPeS	2706-91-4	ND	1.24		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFHpA	375-85-9	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFHxS	355-46-4	1.38	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
6:2 FTS	27619-97-2	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFOA	335-67-1	1.31	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFHpS	375-92-8	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFNA	375-95-1	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFOSA	754-91-6	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFOS	1763-23-1	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFDA	335-76-2	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
8:2 FTS	39108-34-4	ND	1.05		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFNS	68259-12-1	ND	1.98		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
MeFOSAA	2355-31-9	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
EtFOSAA	2991-50-6	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFUnA	2058-94-8	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFDS	335-77-3	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFDaA	307-55-1	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFTTrDA	72629-94-8	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
PFTeDA	376-06-7	ND	1.02		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.2	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C3-PFPeA	IS	97.0	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C3-PFBS	IS	99.8	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C2-4:2 FTS	IS	103	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C2-PFHxA	IS	98.4	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C4-PFHpA	IS	97.8	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C3-PFHxS	IS	103	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C2-6:2 FTS	IS	97.4	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C5-PFNA	IS	115	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C8-PFOSA	IS	59.6	10 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C2-PFOA	IS	99.2	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1
13C8-PFOS	IS	97.6	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1

Sample ID: Basin-B					PFAS Isotope Dilution Method					
Client Data					Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Stormwater		Lab Sample:	2112121-01	Column:	BEH C18		
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 08:47		Date Received:	16-Dec-21 12:58				
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	105	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1	
13C2-8:2 FTS	IS	92.3	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1	
d3-MeFOSAA	IS	120	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1	
13C2-PFUnA	IS	104	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1	
d5-EtFOSAA	IS	93.6	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1	
13C2-PFDoA	IS	94.4	25 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1	
13C2-PFTeDA	IS	78.7	20 - 150		B1L0179	29-Dec-21	0.244 L	31-Dec-21 21:04	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: OFIN-NW
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-02	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:13	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	56.0	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFPeA	2706-90-3	211	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFBS	375-73-5	10.9	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
4:2 FTS	757124-72-4	2.45	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFHxA	307-24-4	171	1.11		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFPeS	2706-91-4	11.1	1.23		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFHpA	375-85-9	81.4	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFHxS	355-46-4	118	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
6:2 FTS	27619-97-2	874	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFOA	335-67-1	241	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFHpS	375-92-8	2.26	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFNA	375-95-1	24.2	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFOSA	754-91-6	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFOS	1763-23-1	251	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFDA	335-76-2	1.14	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
8:2 FTS	39108-34-4	79.0	1.05		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFNS	68259-12-1	ND	1.97		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
MeFOSAA	2355-31-9	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
EtFOSAA	2991-50-6	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFUnA	2058-94-8	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFDS	335-77-3	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFDaA	307-55-1	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFTTrDA	72629-94-8	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
PFTeDA	376-06-7	ND	1.02		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.3	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C3-PFPeA	IS	95.1	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C3-PFBS	IS	96.0	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-4:2 FTS	IS	94.4	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-PFHxA	IS	94.5	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C4-PFHpA	IS	96.9	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C3-PFHxS	IS	98.6	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-6:2 FTS	IS	96.4	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C5-PFNA	IS	109	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C8-PFOSA	IS	56.6	10 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-PFOA	IS	98.2	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C8-PFOS	IS	96.9	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1

Sample ID: OFIN-NW	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Stormwater Date Collected: 15-Dec-21 09:13 Lab Sample: 2112121-02 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	104	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-8:2 FTS	IS	100	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
d3-MeFOSAA	IS	113	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-PFUnA	IS	96.1	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
d5-EtFOSAA	IS	93.3	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-PFDoA	IS	98.8	25 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1
13C2-PFTeDA	IS	90.9	20 - 150		B1L0179	29-Dec-21	0.246 L	31-Dec-21 21:15	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: OFIN-NW_dissolved
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-03	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:13	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	57.5	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFPeA	2706-90-3	219	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFBS	375-73-5	11.2	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
4:2 FTS	757124-72-4	2.20	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFHxA	307-24-4	174	1.11		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFPeS	2706-91-4	11.4	1.23		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFHpA	375-85-9	93.4	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFHxS	355-46-4	127	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
6:2 FTS	27619-97-2	936	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFOA	335-67-1	258	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFHpS	375-92-8	1.84	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFNA	375-95-1	24.2	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFOSA	754-91-6	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFOS	1763-23-1	257	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFDA	335-76-2	1.03	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
8:2 FTS	39108-34-4	75.2	1.05		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFNS	68259-12-1	ND	1.97		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
MeFOSAA	2355-31-9	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
EtFOSAA	2991-50-6	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFUnA	2058-94-8	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFDS	335-77-3	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFDoA	307-55-1	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFTTrDA	72629-94-8	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
PFTeDA	376-06-7	ND	1.02		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	83.0	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C3-PFPeA	IS	88.0	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C3-PFBS	IS	84.0	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C2-4:2 FTS	IS	103	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C2-PFHxA	IS	88.7	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C4-PFHpA	IS	84.8	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C3-PFHxS	IS	89.7	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C2-6:2 FTS	IS	76.7	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C5-PFNA	IS	91.2	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C8-PFOSA	IS	43.7	10 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C2-PFOA	IS	90.3	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1
13C8-PFOS	IS	93.0	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1

Sample ID: OFIN-NW_dissolved					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 09:13				Laboratory Data Lab Sample: 2112121-03 Date Received: 16-Dec-21 12:58 Column: BEH C18						
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	101	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1	
13C2-8:2 FTS	IS	88.2	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1	
d3-MeFOSAA	IS	82.9	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1	
13C2-PFUnA	IS	92.7	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1	
d5-EtFOSAA	IS	87.8	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1	
13C2-PFDoA	IS	79.8	25 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1	
13C2-PFTeDA	IS	74.9	20 - 150		B22A106	20-Jan-22	0.246 L	22-Jan-22 01:50	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: DUP-1
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-04	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:13	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	56.0	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFPeA	2706-90-3	199	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFBS	375-73-5	11.5	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
4:2 FTS	757124-72-4	1.69	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFHxA	307-24-4	174	1.12		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFPeS	2706-91-4	11.5	1.25		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFHpA	375-85-9	84.4	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFHxS	355-46-4	120	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
6:2 FTS	27619-97-2	943	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFOA	335-67-1	246	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFHpS	375-92-8	2.28	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFNA	375-95-1	22.9	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFOSA	754-91-6	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFOS	1763-23-1	250	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFDA	335-76-2	1.22	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
8:2 FTS	39108-34-4	74.2	1.06		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFNS	68259-12-1	ND	1.99		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
MeFOSAA	2355-31-9	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
EtFOSAA	2991-50-6	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFUnA	2058-94-8	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFDS	335-77-3	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFDaA	307-55-1	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFTTrDA	72629-94-8	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
PFTeDA	376-06-7	ND	1.03		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	92.1	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C3-PFPeA	IS	104	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C3-PFBS	IS	100	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C2-4:2 FTS	IS	122	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C2-PFHxA	IS	100	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C4-PFHpA	IS	102	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C3-PFHxS	IS	102	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C2-6:2 FTS	IS	99.1	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C5-PFNA	IS	125	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C8-PFOSA	IS	62.2	10 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C2-PFOA	IS	104	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1
13C8-PFOS	IS	104	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1

Sample ID: DUP-1					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 09:13				Laboratory Data Lab Sample: 2112121-04 Date Received: 16-Dec-21 12:58 Column: BEH C18						
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	105	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1	
13C2-8:2 FTS	IS	98.9	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1	
d3-MeFOSAA	IS	126	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1	
13C2-PFUnA	IS	123	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1	
d5-EtFOSAA	IS	94.3	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1	
13C2-PFDoA	IS	103	25 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1	
13C2-PFTeDA	IS	101	20 - 150		B1L0179	29-Dec-21	0.243 L	31-Dec-21 21:35	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: IES
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-05	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:36	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	6.04	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFPeA	2706-90-3	13.2	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFBS	375-73-5	1.92	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
4:2 FTS	757124-72-4	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFHxA	307-24-4	9.79	1.10		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFPeS	2706-91-4	1.28	1.22		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFHpA	375-85-9	6.52	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFHxS	355-46-4	14.4	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
6:2 FTS	27619-97-2	1.06	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFOA	335-67-1	10.1	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFHpS	375-92-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFNA	375-95-1	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFOSA	754-91-6	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFOS	1763-23-1	9.20	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFDA	335-76-2	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
8:2 FTS	39108-34-4	ND	1.04		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFNS	68259-12-1	ND	1.96		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
MeFOSAA	2355-31-9	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
EtFOSAA	2991-50-6	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFUnA	2058-94-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFDS	335-77-3	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFDaA	307-55-1	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFTTrDA	72629-94-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
PFTeDA	376-06-7	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	96.8	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C3-PFPeA	IS	99.9	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C3-PFBS	IS	100	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C2-4:2 FTS	IS	94.9	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C2-PFHxA	IS	97.7	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C4-PFHpA	IS	101	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C3-PFHxS	IS	95.2	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C2-6:2 FTS	IS	113	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C5-PFNA	IS	116	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C8-PFOSA	IS	59.3	10 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C2-PFOA	IS	103	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1
13C8-PFOS	IS	101	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1

Sample ID: IES					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 09:36				Laboratory Data Lab Sample: 2112121-05 Date Received: 16-Dec-21 12:58 Column: BEH C18						
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	108	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1	
13C2-8:2 FTS	IS	100	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1	
d3-MeFOSAA	IS	111	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1	
13C2-PFUnA	IS	109	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1	
d5-EtFOSAA	IS	96.5	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1	
13C2-PFDoA	IS	97.5	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1	
13C2-PFTeDA	IS	96.7	20 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 21:45	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: 2
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-06	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:51	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	6.07	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFPeA	2706-90-3	11.1	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFBS	375-73-5	1.11	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
4:2 FTS	757124-72-4	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFHxA	307-24-4	10.5	1.09		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFPeS	2706-91-4	ND	1.21		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFHpA	375-85-9	8.07	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFHxS	355-46-4	14.0	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
6:2 FTS	27619-97-2	3.56	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFOA	335-67-1	9.98	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFHpS	375-92-8	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFNA	375-95-1	2.30	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFOSA	754-91-6	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFOS	1763-23-1	13.0	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFDA	335-76-2	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
8:2 FTS	39108-34-4	ND	1.03		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFNS	68259-12-1	ND	1.93		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
MeFOSAA	2355-31-9	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
EtFOSAA	2991-50-6	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFUnA	2058-94-8	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFDS	335-77-3	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFDaA	307-55-1	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFTTrDA	72629-94-8	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
PFTeDA	376-06-7	ND	0.998		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	81.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C3-PFPeA	IS	100	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C3-PFBS	IS	101	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-4:2 FTS	IS	118	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-PFHxA	IS	100	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C4-PFHpA	IS	102	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C3-PFHxS	IS	96.2	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-6:2 FTS	IS	98.3	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C5-PFNA	IS	115	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C8-PFOSA	IS	62.3	10 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-PFOA	IS	106	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C8-PFOS	IS	101	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1

Sample ID: 2	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 09:51	Laboratory Data Lab Sample: 2112121-06 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	102	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-8:2 FTS	IS	91.5	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
d3-MeFOSAA	IS	115	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-PFUnA	IS	109	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
d5-EtFOSAA	IS	92.8	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-PFDoA	IS	94.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1
13C2-PFTeDA	IS	92.3	20 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 21:56	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 7
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-07	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 10:09	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	4.40	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFPeA	2706-90-3	10.6	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFBS	375-73-5	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
4:2 FTS	757124-72-4	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFHxA	307-24-4	6.48	1.08		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFPeS	2706-91-4	ND	1.19		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFHpA	375-85-9	1.80	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFHxS	355-46-4	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
6:2 FTS	27619-97-2	17.8	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFOA	335-67-1	1.59	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFHpS	375-92-8	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFNA	375-95-1	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFOSA	754-91-6	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFOS	1763-23-1	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFDA	335-76-2	1.00	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
8:2 FTS	39108-34-4	1.96	1.02		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFNS	68259-12-1	ND	1.91		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
MeFOSAA	2355-31-9	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
EtFOSAA	2991-50-6	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFUnA	2058-94-8	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFDS	335-77-3	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFDoA	307-55-1	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFTTrDA	72629-94-8	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
PFTeDA	376-06-7	ND	0.987		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	90.7	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C3-PFPeA	IS	104	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C3-PFBS	IS	99.4	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-4:2 FTS	IS	119	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-PFHxA	IS	96.6	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C4-PFHpA	IS	98.7	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C3-PFHxS	IS	98.8	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-6:2 FTS	IS	97.0	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C5-PFNA	IS	121	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C8-PFOSA	IS	66.9	10 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-PFOA	IS	100	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C8-PFOS	IS	103	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1

Sample ID: 7	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Stormwater Date Collected: 15-Dec-21 10:09 Lab Sample: 2112121-07 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	118	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-8:2 FTS	IS	111	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
d3-MeFOSAA	IS	114	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-PFUnA	IS	107	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
d5-EtFOSAA	IS	96.3	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-PFDoA	IS	92.1	25 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1
13C2-PFTeDA	IS	83.5	20 - 150		B1L0179	29-Dec-21	0.253 L	31-Dec-21 22:06	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: SW-3
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-08	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 11:30	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	5.59	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFPeA	2706-90-3	15.0	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFBS	375-73-5	1.70	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
4:2 FTS	757124-72-4	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFHxA	307-24-4	13.2	1.11		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFPeS	2706-91-4	ND	1.24		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFHpA	375-85-9	6.97	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFHxS	355-46-4	14.2	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
6:2 FTS	27619-97-2	25.3	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFOA	335-67-1	15.4	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFHpS	375-92-8	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFNA	375-95-1	1.66	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFOSA	754-91-6	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFOS	1763-23-1	15.4	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFDA	335-76-2	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
8:2 FTS	39108-34-4	1.96	1.05		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFNS	68259-12-1	ND	1.98		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
MeFOSAA	2355-31-9	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
EtFOSAA	2991-50-6	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFUnA	2058-94-8	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFDS	335-77-3	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFDoA	307-55-1	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFTTrDA	72629-94-8	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
PFTeDA	376-06-7	ND	1.02		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.2	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C3-PFPeA	IS	97.6	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C3-PFBS	IS	98.1	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-4:2 FTS	IS	112	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-PFHxA	IS	95.4	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C4-PFHpA	IS	102	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C3-PFHxS	IS	94.7	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-6:2 FTS	IS	94.4	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C5-PFNA	IS	118	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C8-PFOSA	IS	57.3	10 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-PFOA	IS	105	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C8-PFOS	IS	101	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1

Sample ID: SW-3	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Stormwater Date Collected: 15-Dec-21 11:30 Lab Sample: 2112121-08 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	98.8	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-8:2 FTS	IS	80.7	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
d3-MeFOSAA	IS	118	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-PFUnA	IS	104	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
d5-EtFOSAA	IS	93.7	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-PFDoA	IS	97.0	25 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1
13C2-PFTeDA	IS	89.0	20 - 150		B1L0179	29-Dec-21	0.245 L	31-Dec-21 22:16	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: EQ
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-09	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 11:40	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFPeA	2706-90-3	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFBS	375-73-5	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
4:2 FTS	757124-72-4	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFHxA	307-24-4	ND	1.07		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFPeS	2706-91-4	ND	1.19		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFHpA	375-85-9	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFHxS	355-46-4	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
6:2 FTS	27619-97-2	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFOA	335-67-1	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFHpS	375-92-8	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFNA	375-95-1	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFOSA	754-91-6	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFOS	1763-23-1	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFDA	335-76-2	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
8:2 FTS	39108-34-4	ND	1.01		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFNS	68259-12-1	ND	1.90		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
MeFOSAA	2355-31-9	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
EtFOSAA	2991-50-6	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFUnA	2058-94-8	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFDS	335-77-3	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFDoA	307-55-1	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFTTrDA	72629-94-8	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
PFTeDA	376-06-7	ND	0.981		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	86.6	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C3-PFPeA	IS	90.6	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C3-PFBS	IS	94.8	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-4:2 FTS	IS	104	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-PFHxA	IS	92.0	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C4-PFHpA	IS	88.8	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C3-PFHxS	IS	86.7	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-6:2 FTS	IS	82.1	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C5-PFNA	IS	105	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C8-PFOSA	IS	37.6	10 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-PFOA	IS	97.9	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C8-PFOS	IS	88.2	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1

Sample ID: EQ	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Stormwater Date Collected: 15-Dec-21 11:40 Lab Sample: 2112121-09 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	88.9	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-8:2 FTS	IS	81.1	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
d3-MeFOSAA	IS	98.1	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-PFUnA	IS	91.9	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
d5-EtFOSAA	IS	72.4	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-PFDoA	IS	74.1	25 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1
13C2-PFTeDA	IS	70.3	20 - 150		B1L0179	29-Dec-21	0.255 L	31-Dec-21 22:57	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 9
PFAS Isotope Dilution Method

Client Data					Laboratory Data				
Name:	Apex Companies, LLC	Matrix:	Stormwater		Lab Sample:	2112121-10	Column:	BEH C18	
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 08:35		Date Received:	16-Dec-21 12:58			

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	5.51	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFPeA	2706-90-3	4.09	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFBS	375-73-5	3.43	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
4:2 FTS	757124-72-4	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFHxA	307-24-4	4.46	1.09		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFPeS	2706-91-4	5.62	1.21		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFHpA	375-85-9	1.77	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFHxS	355-46-4	29.4	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
6:2 FTS	27619-97-2	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFOA	335-67-1	4.44	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFHpS	375-92-8	1.03	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFNA	375-95-1	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFOSA	754-91-6	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFOS	1763-23-1	36.2	1.00	Q	B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFDA	335-76-2	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
8:2 FTS	39108-34-4	ND	1.03		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFNS	68259-12-1	ND	1.94		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
MeFOSAA	2355-31-9	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
EtFOSAA	2991-50-6	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFUnA	2058-94-8	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFDS	335-77-3	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFDaA	307-55-1	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFTTrDA	72629-94-8	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
PFTeDA	376-06-7	ND	1.00		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	75.9	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C3-PFPeA	IS	90.3	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C3-PFBS	IS	89.7	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-4:2 FTS	IS	94.0	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-PFHxA	IS	87.1	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C4-PFHpA	IS	93.3	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C3-PFHxS	IS	94.9	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-6:2 FTS	IS	82.9	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C5-PFNA	IS	106	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C8-PFOSA	IS	54.0	10 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-PFOA	IS	96.3	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C8-PFOS	IS	92.3	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1

Sample ID: 9	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 08:35	Laboratory Data Lab Sample: 2112121-10 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	101	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-8:2 FTS	IS	95.2	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
d3-MeFOSAA	IS	109	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-PFUnA	IS	91.9	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
d5-EtFOSAA	IS	87.0	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-PFDoA	IS	88.4	25 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1
13C2-PFTeDA	IS	75.5	20 - 150		B1L0179	29-Dec-21	0.250 L	31-Dec-21 23:07	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 8
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-11	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 08:52	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.07	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFPeA	2706-90-3	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFBS	375-73-5	1.11	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
4:2 FTS	757124-72-4	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFHxA	307-24-4	ND	1.10		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFPeS	2706-91-4	ND	1.22		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFHpA	375-85-9	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFHxS	355-46-4	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
6:2 FTS	27619-97-2	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFOA	335-67-1	1.29	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFHpS	375-92-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFNA	375-95-1	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFOSA	754-91-6	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFOS	1763-23-1	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFDA	335-76-2	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
8:2 FTS	39108-34-4	ND	1.04		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFNS	68259-12-1	ND	1.96		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
MeFOSAA	2355-31-9	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
EtFOSAA	2991-50-6	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFUnA	2058-94-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFDS	335-77-3	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFDoA	307-55-1	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFTTrDA	72629-94-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
PFTeDA	376-06-7	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	85.5	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C3-PFPeA	IS	93.4	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C3-PFBS	IS	94.0	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-4:2 FTS	IS	96.2	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-PFHxA	IS	90.5	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C4-PFHpA	IS	91.1	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C3-PFHxS	IS	95.6	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-6:2 FTS	IS	96.3	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C5-PFNA	IS	109	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C8-PFOSA	IS	58.7	10 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-PFOA	IS	92.3	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C8-PFOS	IS	93.2	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1

Sample ID: 8	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 08:52	Laboratory Data Lab Sample: 2112121-11 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	90.2	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-8:2 FTS	IS	79.1	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
d3-MeFOSAA	IS	106	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-PFUnA	IS	104	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
d5-EtFOSAA	IS	87.2	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-PFDoA	IS	82.6	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1
13C2-PFTeDA	IS	62.6	20 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:17	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 6
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-12	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:12	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	9.45	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFPeA	2706-90-3	22.8	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFBS	375-73-5	17.0	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
4:2 FTS	757124-72-4	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFHxA	307-24-4	27.9	1.10		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFPeS	2706-91-4	17.9	1.22		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFHpA	375-85-9	11.0	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFHxS	355-46-4	141	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
6:2 FTS	27619-97-2	27.6	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFOA	335-67-1	24.5	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFHpS	375-92-8	3.36	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFNA	375-95-1	2.08	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFOSA	754-91-6	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFOS	1763-23-1	201	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFDA	335-76-2	1.45	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
8:2 FTS	39108-34-4	2.88	1.04		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFNS	68259-12-1	ND	1.95		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
MeFOSAA	2355-31-9	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
EtFOSAA	2991-50-6	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFUnA	2058-94-8	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFDS	335-77-3	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFDoA	307-55-1	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFTTrDA	72629-94-8	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
PFTeDA	376-06-7	ND	1.01		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	84.6	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C3-PFPeA	IS	97.3	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C3-PFBS	IS	93.2	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-4:2 FTS	IS	111	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-PFHxA	IS	95.3	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C4-PFHpA	IS	96.5	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C3-PFHxS	IS	94.6	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-6:2 FTS	IS	101	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C5-PFNA	IS	110	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C8-PFOSA	IS	59.5	10 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-PFOA	IS	92.2	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C8-PFOS	IS	96.3	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1

Sample ID: 6	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 09:12	Laboratory Data Lab Sample: 2112121-12 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	101	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-8:2 FTS	IS	102	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
d3-MeFOSAA	IS	110	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-PFUnA	IS	98.1	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
d5-EtFOSAA	IS	91.7	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-PFDoA	IS	92.0	25 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1
13C2-PFTeDA	IS	81.1	20 - 150		B1L0179	29-Dec-21	0.248 L	31-Dec-21 23:27	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 6_dissolved
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-13	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:12	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	9.44	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFPeA	2706-90-3	24.8	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFBS	375-73-5	19.6	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
4:2 FTS	757124-72-4	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFHxA	307-24-4	27.7	1.08		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFPeS	2706-91-4	18.9	1.20		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFHpA	375-85-9	11.7	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFHxS	355-46-4	142	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
6:2 FTS	27619-97-2	31.6	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFOA	335-67-1	24.2	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFHpS	375-92-8	3.16	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFNA	375-95-1	2.18	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFOSA	754-91-6	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFOS	1763-23-1	211	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFDA	335-76-2	1.29	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
8:2 FTS	39108-34-4	2.66	1.02		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFNS	68259-12-1	ND	1.91		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
MeFOSAA	2355-31-9	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
EtFOSAA	2991-50-6	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFUnA	2058-94-8	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFDS	335-77-3	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFDoA	307-55-1	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFTTrDA	72629-94-8	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
PFTeDA	376-06-7	ND	0.988		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	86.6	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C3-PFPeA	IS	91.3	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C3-PFBS	IS	89.1	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C2-4:2 FTS	IS	113	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C2-PFHxA	IS	93.2	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C4-PFHpA	IS	93.1	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C3-PFHxS	IS	92.4	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C2-6:2 FTS	IS	87.8	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C5-PFNA	IS	96.5	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C8-PFOSA	IS	44.0	10 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C2-PFOA	IS	92.6	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1
13C8-PFOS	IS	102	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1

Sample ID: 6_dissolved					PFAS Isotope Dilution Method					
Client Data					Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Stormwater		Lab Sample:	2112121-13	Column:	BEH C18		
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:12		Date Received:	16-Dec-21 12:58				
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	100	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1	
13C2-8:2 FTS	IS	95.7	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1	
d3-MeFOSAA	IS	90.2	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1	
13C2-PFUnA	IS	93.1	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1	
d5-EtFOSAA	IS	85.3	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1	
13C2-PFDoA	IS	82.8	25 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1	
13C2-PFTeDA	IS	67.6	20 - 150		B22A106	20-Jan-22	0.253 L	22-Jan-22 02:01	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: 5
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-14	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:36	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	2.22	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFPeA	2706-90-3	1.27	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFBS	375-73-5	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
4:2 FTS	757124-72-4	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFHxA	307-24-4	1.49	1.10		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFPeS	2706-91-4	ND	1.22		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFHpA	375-85-9	1.08	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFHxS	355-46-4	1.28	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
6:2 FTS	27619-97-2	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFOA	335-67-1	3.03	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFHpS	375-92-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFNA	375-95-1	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFOSA	754-91-6	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFOS	1763-23-1	15.8	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFDA	335-76-2	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
8:2 FTS	39108-34-4	ND	1.04		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFNS	68259-12-1	ND	1.96		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
MeFOSAA	2355-31-9	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
EtFOSAA	2991-50-6	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFUnA	2058-94-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFDS	335-77-3	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFDaA	307-55-1	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFTTrDA	72629-94-8	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
PFTeDA	376-06-7	ND	1.01		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	87.2	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C3-PFPeA	IS	99.7	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C3-PFBS	IS	97.1	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-4:2 FTS	IS	111	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-PFHxA	IS	96.5	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C4-PFHpA	IS	101	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C3-PFHxS	IS	95.6	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-6:2 FTS	IS	95.9	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C5-PFNA	IS	120	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C8-PFOSA	IS	67.0	10 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-PFOA	IS	103	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C8-PFOS	IS	99.9	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1

Sample ID: 5	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Stormwater Date Collected: 15-Dec-21 09:36 Lab Sample: 2112121-14 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	102	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-8:2 FTS	IS	95.0	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
d3-MeFOSAA	IS	102	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-PFUnA	IS	104	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
d5-EtFOSAA	IS	95.2	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-PFDoA	IS	95.3	25 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1
13C2-PFTeDA	IS	85.4	20 - 150		B1L0179	29-Dec-21	0.247 L	31-Dec-21 23:48	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 4
PFAS Isotope Dilution Method

Client Data					Laboratory Data				
Name:	Apex Companies, LLC	Matrix:	Stormwater		Lab Sample:	2112121-15	Column:	BEH C18	
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 09:50		Date Received:	16-Dec-21 12:58			

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	3.70	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFPeA	2706-90-3	4.84	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFBS	375-73-5	1.25	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
4:2 FTS	757124-72-4	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFHxA	307-24-4	5.13	1.08		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFPeS	2706-91-4	ND	1.20		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFHpA	375-85-9	3.57	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFHxS	355-46-4	4.71	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
6:2 FTS	27619-97-2	11.8	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFOA	335-67-1	9.87	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFHpS	375-92-8	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFNA	375-95-1	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFOSA	754-91-6	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFOS	1763-23-1	5.60	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFDA	335-76-2	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
8:2 FTS	39108-34-4	2.28	1.02		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFNS	68259-12-1	ND	1.92		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
MeFOSAA	2355-31-9	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
EtFOSAA	2991-50-6	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFUnA	2058-94-8	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFDS	335-77-3	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFDoA	307-55-1	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFTTrDA	72629-94-8	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
PFTeDA	376-06-7	ND	0.994		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	102	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C3-PFPeA	IS	110	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C3-PFBS	IS	106	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-4:2 FTS	IS	115	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-PFHxA	IS	104	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C4-PFHpA	IS	108	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C3-PFHxS	IS	104	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-6:2 FTS	IS	112	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C5-PFNA	IS	138	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C8-PFOSA	IS	67.5	10 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-PFOA	IS	109	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C8-PFOS	IS	105	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1

Sample ID: 4	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Stormwater Date Collected: 15-Dec-21 09:50 Lab Sample: 2112121-15 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	118	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-8:2 FTS	IS	117	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
d3-MeFOSAA	IS	128	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-PFUnA	IS	110	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
d5-EtFOSAA	IS	103	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-PFDoA	IS	95.0	25 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1
13C2-PFTeDA	IS	95.2	20 - 150		B1L0179	29-Dec-21	0.251 L	31-Dec-21 23:58	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: 3
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-16	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 10:08	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	1.54	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFPeA	2706-90-3	1.82	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFBS	375-73-5	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
4:2 FTS	757124-72-4	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFHxA	307-24-4	1.22	1.10		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFPeS	2706-91-4	ND	1.22		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFHpA	375-85-9	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFHxS	355-46-4	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
6:2 FTS	27619-97-2	2.97	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFOA	335-67-1	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFHpS	375-92-8	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFNA	375-95-1	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFOSA	754-91-6	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFOS	1763-23-1	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFDA	335-76-2	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
8:2 FTS	39108-34-4	7.25	1.04		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFNS	68259-12-1	ND	1.95		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
MeFOSAA	2355-31-9	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
EtFOSAA	2991-50-6	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFUnA	2058-94-8	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFDS	335-77-3	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFDoA	307-55-1	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFTTrDA	72629-94-8	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
PFTeDA	376-06-7	ND	1.01		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.1	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C3-PFPeA	IS	104	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C3-PFBS	IS	105	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-4:2 FTS	IS	119	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-PFHxA	IS	103	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C4-PFHpA	IS	102	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C3-PFHxS	IS	104	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-6:2 FTS	IS	107	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C5-PFNA	IS	118	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C8-PFOSA	IS	72.8	10 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-PFOA	IS	110	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C8-PFOS	IS	108	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1

Sample ID: 3	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 10:08	Laboratory Data Lab Sample: 2112121-16 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	97.9	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-8:2 FTS	IS	98.2	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
d3-MeFOSAA	IS	117	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-PFUnA	IS	110	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
d5-EtFOSAA	IS	95.9	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-PFDoA	IS	105	25 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1
13C2-PFTeDA	IS	95.7	20 - 150		B1L0179	29-Dec-21	0.249 L	01-Jan-22 00:08	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: SW-2
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-17	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 10:35	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	30.3	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFPeA	2706-90-3	110	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFBS	375-73-5	6.52	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
4:2 FTS	757124-72-4	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFHxA	307-24-4	89.7	1.06		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFPeS	2706-91-4	6.32	1.17		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFHpA	375-85-9	44.0	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFHxS	355-46-4	62.8	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
6:2 FTS	27619-97-2	388	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFOA	335-67-1	110	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFHpS	375-92-8	1.06	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFNA	375-95-1	12.1	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFOSA	754-91-6	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFOS	1763-23-1	124	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFDA	335-76-2	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
8:2 FTS	39108-34-4	34.4	0.999		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFNS	68259-12-1	ND	1.88		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
MeFOSAA	2355-31-9	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
EtFOSAA	2991-50-6	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFUnA	2058-94-8	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFDS	335-77-3	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFDoA	307-55-1	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFTTrDA	72629-94-8	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
PFTeDA	376-06-7	ND	0.970		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	93.0	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C3-PFPeA	IS	97.1	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C3-PFBS	IS	99.9	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-4:2 FTS	IS	109	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-PFHxA	IS	95.3	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C4-PFHpA	IS	95.4	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C3-PFHxS	IS	98.2	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-6:2 FTS	IS	90.2	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C5-PFNA	IS	111	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C8-PFOSA	IS	66.3	10 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-PFOA	IS	102	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C8-PFOS	IS	101	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1

Sample ID: SW-2	PFAS Isotope Dilution Method
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Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility	Laboratory Data Matrix: Stormwater Date Collected: 15-Dec-21 10:35 Lab Sample: 2112121-17 Date Received: 16-Dec-21 12:58 Column: BEH C18
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Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFDA	IS	115	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-8:2 FTS	IS	88.3	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
d3-MeFOSAA	IS	116	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-PFUnA	IS	99.8	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
d5-EtFOSAA	IS	99.2	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-PFDoA	IS	94.2	25 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1
13C2-PFTeDA	IS	94.7	20 - 150		B1L0179	29-Dec-21	0.258 L	01-Jan-22 00:19	1

RL - Reporting limit

Results reported to RL.

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

Sample ID: SW-2_dissolved
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-18	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 10:35	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	30.4	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFPeA	2706-90-3	109	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFBS	375-73-5	6.36	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
4:2 FTS	757124-72-4	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFHxA	307-24-4	83.3	1.07		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFPeS	2706-91-4	6.47	1.19		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFHpA	375-85-9	45.1	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFHxS	355-46-4	56.7	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
6:2 FTS	27619-97-2	486	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFOA	335-67-1	113	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFHpS	375-92-8	0.999	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFNA	375-95-1	12.1	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFOSA	754-91-6	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFOS	1763-23-1	113	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFDA	335-76-2	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
8:2 FTS	39108-34-4	27.3	1.01		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFNS	68259-12-1	ND	1.90		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
MeFOSAA	2355-31-9	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
EtFOSAA	2991-50-6	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFUnA	2058-94-8	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFDS	335-77-3	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFDoA	307-55-1	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFTTrDA	72629-94-8	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
PFTeDA	376-06-7	ND	0.980		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	82.5	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C3-PFPeA	IS	87.4	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C3-PFBS	IS	86.3	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C2-4:2 FTS	IS	110	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C2-PFHxA	IS	92.7	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C4-PFHpA	IS	89.3	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C3-PFHxS	IS	96.6	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C2-6:2 FTS	IS	75.2	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C5-PFNA	IS	90.9	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C8-PFOSA	IS	39.5	10 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C2-PFOA	IS	91.9	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1
13C8-PFOS	IS	96.8	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1

Sample ID: SW-2_dissolved					PFAS Isotope Dilution Method					
Client Data					Laboratory Data					
Name:	Apex Companies, LLC	Matrix:	Stormwater		Lab Sample:	2112121-18	Column:	BEH C18		
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 10:35		Date Received:	16-Dec-21 12:58				
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	102	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1	
13C2-8:2 FTS	IS	90.7	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1	
d3-MeFOSAA	IS	81.5	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1	
13C2-PFUnA	IS	84.2	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1	
d5-EtFOSAA	IS	84.9	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1	
13C2-PFDoA	IS	75.4	25 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1	
13C2-PFTeDA	IS	74.3	20 - 150		B22A106	20-Jan-22	0.255 L	22-Jan-22 02:11	1	

RL - Reporting limit

Results reported to RL.

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

Sample ID: FB-1
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	Apex Companies, LLC	Matrix:	Stormwater	Lab Sample:	2112121-19	Column:	BEH C18
Project:	PDX Fire Training Facility	Date Collected:	15-Dec-21 10:42	Date Received:	16-Dec-21 12:58		

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFPeA	2706-90-3	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFBS	375-73-5	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
4:2 FTS	757124-72-4	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFHxA	307-24-4	ND	1.11		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFPeS	2706-91-4	ND	1.24		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFHpA	375-85-9	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFHxS	355-46-4	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
6:2 FTS	27619-97-2	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFOA	335-67-1	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFHpS	375-92-8	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFNA	375-95-1	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFOSA	754-91-6	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFOS	1763-23-1	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFDA	335-76-2	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
8:2 FTS	39108-34-4	ND	1.05		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFNS	68259-12-1	ND	1.98		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
MeFOSAA	2355-31-9	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
EtFOSAA	2991-50-6	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFUnA	2058-94-8	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFDS	335-77-3	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFDoA	307-55-1	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFTTrDA	72629-94-8	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
PFTeDA	376-06-7	ND	1.02		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.8	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C3-PFPeA	IS	97.0	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C3-PFBS	IS	90.7	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C2-4:2 FTS	IS	102	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C2-PFHxA	IS	95.1	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C4-PFHpA	IS	96.7	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C3-PFHxS	IS	89.3	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C2-6:2 FTS	IS	94.8	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C5-PFNA	IS	121	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C8-PFOSA	IS	40.2	10 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C2-PFOA	IS	103	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1
13C8-PFOS	IS	92.3	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1

Sample ID: FB-1					PFAS Isotope Dilution Method					
Client Data Name: Apex Companies, LLC Project: PDX Fire Training Facility Matrix: Stormwater Date Collected: 15-Dec-21 10:42					Laboratory Data Lab Sample: 2112121-19 Date Received: 16-Dec-21 12:58 Column: BEH C18					
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFDA	IS	105	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1	
13C2-8:2 FTS	IS	77.5	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1	
d3-MeFOSAA	IS	99.0	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1	
13C2-PFUnA	IS	101	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1	
d5-EtFOSAA	IS	82.8	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1	
13C2-PFDoA	IS	88.1	25 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1	
13C2-PFTeDA	IS	84.5	20 - 150		B1L0179	29-Dec-21	0.245 L	01-Jan-22 00:39	1	

RL - Reporting limit

Results reported to RL.

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

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection Limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
MDL	Method Detection Limit
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
RL	For 537.1, the reported RLs are the MRLs.
TEQ	Toxic Equivalency, sum of the toxic equivalency factors (TEF) multiplied by the sample concentrations.
TEQMax	TEQ calculation that uses the detection limit as the concentration for non-detects
TEQMin	TEQ calculation that uses zero as the concentration for non-detects
TEQRisk	TEQ calculation that uses ½ the detection limit as the concentration for non-detects
U	Not Detected (specific projects only)
*	See Cover Letter

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

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	21-023-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-26
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2020018
Massachusetts Department of Environmental Protection	M-CA413
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1980678
New Hampshire Environmental Accreditation Program	207720
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Ohio Environmental Protection Agency	87778
Oregon Laboratory Accreditation Program	4042-016
Pennsylvania Department of Environmental Protection	017
Texas Commission on Environmental Quality	T104704189-21-12
Vermont Department of Health	VT-4042
Virginia Department of General Services	10769
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

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

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p- Dioxins & Polychlorinated Dibenzofurans	EPA 23
Polychlorinated Dibenzodioxins in Ambient Air by GC/HRMS	EPA TO-9A

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

MATRIX: Drinking Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613/1613B
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537.1
Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry	EPA 533
Perfluorooctanesulfonate (PFOS) and Perfluorooctanoate (PFOA) - Method for Unfiltered Samples Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry	ISO 25101 2009

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

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



Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #: 2112121 TAT 572

Samples Arrival:	Date/Time <u>12/16/21 12:52</u>	Initials: <u>162</u>	Location: <u>WR-2</u>
			Shelf/Rack: <u>N/A</u>
Delivered By:	☒ FedEx	☐ UPS	☐ On Trac
	☐ GLS	☐ DHL	☐ Hand Delivered
Other			
Preservation:	☒ Ice	☐ Blue Ice	☐ Techni Ice
	☐ Dry Ice	☐ None	
Temp °C: <u>3.8</u> (uncorrected)	Probe used: Y / ☒ N		Thermometer ID: <u>IR-3</u>
Temp °C: <u>3.8</u> (corrected)			

	YES	NO	NA
Shipping Container(s) Intact?	☒	☐	☐
Shipping Custody Seals Intact?	☐	☐	☒
Airbill <u>Trk # 7755 0918 3018</u>	☒	☐	☐
Shipping Documentation Present?	☒	☐	☐
Shipping Container	☒ Vista	☐ Client	☐ Retain
	☐ Return	☐ Dispose	
Chain of Custody / Sample Documentation Present?	☒	☐	☐
Chain of Custody / Sample Documentation Complete?	☒	☐	☐
Holding Time Acceptable?	☒	☐	☐

Logged In:	Date/Time <u>12/17/21 01:52</u>	Initials: <u>162</u>	Location: <u>R-13, WR-2</u>
			Shelf/Rack: <u>A-3, B-3</u>
COC Anomaly/Sample Acceptance Form completed?			☒

Comments: A) COC #2 Relinquished by omitted.

CoC/Label Reconciliation Report WO# 2112121

LabNumber	CoC Sample ID	SampleAlias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2112121-01	A Basin-B	☒	15-Dec-21 08:47 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-01	B Basin-B	☒	15-Dec-21 08:47 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-02	A OFIN-NW	☒	15-Dec-21 09:13 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-02	B OFIN-NW	☒	15-Dec-21 09:13 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-03	A OFIN-NW_dissolved	☒ 9I	15-Dec-21 09:13 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-03	B OFIN-NW_dissolved	☒	15-Dec-21 09:13 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-04	A DUP-1	☒	15-Dec-21 09:13 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-04	B DUP-1	☒	15-Dec-21 09:13 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-05	A IES	☒	15-Dec-21 09:36 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-05	B IES	☒	15-Dec-21 09:36 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-06	A 2	☒	15-Dec-21 09:51 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-06	B 2	☒	15-Dec-21 09:51 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-07	A 7	☒	15-Dec-21 10:09 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-07	B 7	☒	15-Dec-21 10:09 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-08	A SW-3	☒	15-Dec-21 11:30 ☐ 9I	HDPE Bottle, 250 mL	Aqueous	
2112121-08	B SW-3	☒	15-Dec-21 11:30 ☐	HDPE Bottle, 250 mL	Aqueous	
2112121-09	A EQ	☒	15-Dec-21 11:40 ☐ 9I	HDPE Bottle, 250 mL	Aqueous	
2112121-09	B EQ	☒	15-Dec-21 11:40 ☐	HDPE Bottle, 250 mL	Aqueous	
2112121-10	A 9	☒	15-Dec-21 08:35 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-10	B 9	☒	15-Dec-21 08:35 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-11	A 8	☒	15-Dec-21 08:52 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-11	B 8	☒	15-Dec-21 08:52 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-12	A 6	☒	15-Dec-21 09:12 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-12	B 6	☒	15-Dec-21 09:12 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-13	A 6_dissolved	☒ 9I	15-Dec-21 09:12 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-13	B 6_dissolved	☒	15-Dec-21 09:12 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-14	A 5	☒	15-Dec-21 09:36 ☒	HDPE Bottle, 250 mL	Aqueous	
2112121-14	B 5	☒	15-Dec-21 09:36 ☒	HDPE Bottle, 250 mL	Aqueous	

2112121-15	A 4	☒
2112121-15	B 4	☒
2112121-16	A 3	☒
2112121-16	B 3	☒
2112121-17	A SW-2	☒
2112121-17	B SW-2	☒
2112121-18	A SW-2_dissolved	☒ ①
2112121-18	B SW-2_dissolved	☒ ↓
2112121-19	A FB-1	☒
2112121-19	B FB-1	☒

15-Dec-21 09:50	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 09:50	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:08	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:08	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:35	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:35	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:35	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:35	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:42	☒	HDPE Bottle, 250 mL	Aqueous
15-Dec-21 10:42	☒	HDPE Bottle, 250 mL	Aqueous

Checkmarks indicate that information on the COC reconciled with the sample label.
Any discrepancies are noted in the following columns.

	Yes	No	NA
Sample Container Intact?	☒	☐	☐
Sample Custody Seals Intact?	☐	☐	☒
Adequate Sample Volume?	☒	☐	☐
Container Type Appropriate for Analysis(es)	☒	☐	☐

Comments: ① Sample label time - 10:30
 ② Sample label time - 10:40
 ③ Total and dissolved being analyzed separately for client request.

Preservation Documented: Na2S2O3 Trizma NH4CH3CO2 None Other

Verified by/Date: YS 12/20/21

ANOMALY FORM

Vista Work Order

2112121

Initial/Date The following checked issues were noted during sample receipt and login:

- 12/12/21 ☐ 1. The samples were received out of temperature at (WI-PHT): _____
Was Ice present: Yes No Melted Blue Ice
- 12/12/21 ☒ 2. The Chain-of-Custody (CoC) was not relinquished properly.
- 12/12/21 ☐ 3. The CoC did not include collection time(s). 00:00 will be used unless notified otherwise.
- 12/12/21 ☐ 4. The sample(s) did not include a sample collection time. All or Sample Name: _____
- 12/12/21 ☐ 5. A sample ID discrepancy was found. See the Reconciliation report.
The CoC Sample ID will be used unless notified otherwise.
- 12/12/21 ☒ 6. A sample date and/or time discrepancy was found. See the Reconciliation report.
The CoC Sample date/time will be used unless notified otherwise.
- 12/12/21 ☐ 7. The CoC did not include a sample matrix. The following sample matrix will be used: _____
- 12/12/21 ☐ 8. Insufficient volume received for analysis. All or Sample Name: _____
- 12/12/21 ☐ 9. The backup bottle was received broken. Sample Name: _____
- 12/12/21 ☐ 10. CoC not received, illegible or destroyed.
- 12/12/21 ☐ 11. The sample(s) were received out of holding time. All or Sample Name: _____
- 12/12/21 ☐ 12. The CoC did not include an analysis. All or Sample Name: _____
- 12/12/21 ☐ 13. Sample(s) received without collection date. All or Sample Name: _____
- 12/12/21 ☐ 14. Sample(s) not received. All or Sample Name: _____
- 12/12/21 ☐ 15. Sample(s) received broken. All or Sample Name: _____
- 12/12/21 ☐ 16. An incorrect container-type was used. All or Sample Name: _____
- 12/12/21 ☐ 17. The Field Reagent Blank (FRB) preservative was from a different lot than the field samples.
Will proceed with analysis and narrate unless notified otherwise.
- 12/12/21 ☐ 18. Other: _____

Bolded items require sign-off

Client Contacted: _____

Date of Contact: _____

Vista Client Manager: _____

Resolution: _____