Naval Facilities Engineering Systems Command Northwest
Silverdale, Washington

Final

Technical Memorandum
Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville

Naval Air Station Whidbey Island
Washington

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Prepared for NAVFAC Northwest
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Virginia Beach, Virginia
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Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville, Naval Air Station Whidbey Island, Washington

PREPARED FOR: Naval Facilities Engineering Systems Command (NAVFAC) Northwest
Naval Air Station Whidbey Island

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DATE: March 2022

Introduction

CH2M was contracted by NAVFAC Northwest to evaluate impacts of potential releases of per- and polyfluoroalkyl substances (PFAS) to groundwater near Naval Air Station (NAS) Whidbey Island and collect drinking water samples for PFAS analysis from private drinking water sources near Ault Field and Area 6 located in Oak Harbor, Washington and Outlying Landing Field (OLF) Coupeville located in Coupeville, Washington (**Figure 1**). This technical memorandum presents the results of the fall 2021 (October and November) sampling event performed as part of the biannual monitoring program. The sampling event was conducted in accordance with the *Sampling and Analysis Plan, Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water, Ault Field, Area 6, and Outlying Landing Field Coupeville* (SAP) (CH2M, 2020a), Field Change Request (FCR) 01 (CH2M, 2020b), FCR 02 (CH2M, 2020c), and FCR 03 (CH2M, 2021a). CH2M prepared this technical memorandum for the Department of the Navy (Navy) under the NAVFAC Comprehensive Long-term Environmental Action (CLEAN)—Navy 9000 Contract N62470-16-D-9000, Contract Task Order N4425519F4470.

Per- and Polyfluoroalkyl Substances

PFAS are manufactured chemicals that have been used since the 1950s in many household and industrial products because of their stain- and water-repellant properties. Within the Navy's operations, PFAS are most commonly associated with aqueous film-forming foam (AFFF) used primarily for firefighting (including emergency response, equipment testing and/or training, and fire suppression systems in buildings). PFAS can also be found in vapor suppression systems and in waste streams. PFAS are now present virtually everywhere in the world because of the large amounts that have been manufactured and used as well as their high mobility and persistence. Once these compounds are released to the environment many degrade only very slowly. PFAS are considered "chemicals of emerging concern," which currently have no Safe Drinking Water Act regulatory standards or routine water quality testing requirements. United States Environmental Protection Agency (USEPA) is studying PFAS to determine if national regulation is needed.

The State of Washington does not have an established state standard or promulgated screening value for any PFAS constituent in groundwater. However, in October 2021 the Washington State Department of Health (DOH) adopted state action levels (SALs) for group A drinking water systems for five constituents (PFOA, PFOS, PFNA, PFHxS, and PFBS) that became effective January 1, 2022 (DOH, 2021a). In November 2021, Washington State established the process and criteria to develop state maximum contamination levels (DOH, 2021b). The SALs are not applicable to the Navy's off-Base drinking water sampling program at this time.

USEPA issued the Third Unregulated Contaminant Monitoring Rule (UCMR 3)[1] in May 2012 and the Fifth Unregulated Contaminant Monitoring Rule (UCMR 5) in December 2021. The UCMR 3 required monitoring of 6 PFAS between 2013 and 2015, and the UCMR 5 requires monitoring of 29 PFAS between 2023 and 2025. Both UCMR 3 and UCMR 5 apply to all large public water systems serving more than 10,000 people and 800 representative public water systems serving 10,000 or fewer people. Of the PFAS included in UCMR 3 and UCMR 5, USEPA has issued lifetime health advisories[2] for only two—perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS)—and has published toxicity values for another—perfluorobutane sulfonate (PFBS). Health advisories are not regulatory standards. They are health-based concentrations that should offer a margin of protection for all Americans throughout their lives from adverse health effects resulting from exposure to PFOS and PFOA in drinking water. The USEPA lifetime health advisories for lifetime exposure are 70 nanograms per liter (ng/L) for PFOS and 70 ng/L for PFOA. When both PFOS and PFOA are found in drinking water, the combined concentrations should not exceed 70 ng/L (USEPA, 2016a, 2016b).

Navy Policy

The Navy issued a policy in 2014 (Navy, 2014) requiring on-Base drinking water sampling for PFOS and PFOA for Bases where groundwater was used as drinking water and PFAS could have been released nearby. Under the policy, all installations not previously tested under UCMR 3 that produce drinking water from on-Base sources and have an identified or suspected PFAS release within approximately 1 mile upgradient of the drinking water source, were required to sample their finished drinking water by December 2015. In June 2016, the Navy issued additional policy (Navy, 2016b) that required all Navy Bases not previously tested under UCMR 3 or the 2014 policy (Navy, 2014) to test their finished drinking water, regardless of the water source (on-Base or municipal) or potential/known source of a PFAS release to the environment. Ault Field's water is supplied by the City of Oak Harbor, and Oak Harbor's water is supplied by the City of Anacortes. The drinking water provided by the City of Anacortes, the City of Oak Harbor, and Ault Field was sampled under UCMR 3, and PFAS were not detected. Two on-Base drinking water wells at OLF Coupeville were sampled for PFAS in October 2016 (ALS Environmental, 2016). PFAS were not detected in the on-Base drinking water well located in the northern portion of the site near Building 11. PFAS were detected in the on-Base drinking water well in the southwestern portion of the OLF near Building 2807 (ALS Environmental, 2016).

In June 2016, the Navy also issued a policy (Navy, 2016c) to identify and prioritize sites for investigation of drinking water resources, on- or off-Base, that are thought to be vulnerable to PFAS impacts from past Navy releases of PFAS, with a focus on release of AFFF. Sites with drinking water sources (water supply wells, surface water bodies used for drinking water, and reservoirs) within 1 mile downgradient of known or potential releases of PFAS were assigned the highest priority. Drinking water near these high-priority, Priority 1 sites was required to be sampled within fiscal year 2017.

Priority 1 sites at NAS Whidbey Island included the Ault Field Runway Ditches/Former Runway Fire School (Areas 16/31), Ault Field Current Fire Training Area, and OLF Coupeville. Although not identified as a Priority 1 site for PFAS investigation, the Area 6 Former Landfill was added to the off-Base drinking water investigation because of its history as a municipal and industrial waste disposal facility consistent with possible releases of PFAS. The Navy has sampled 286 drinking water wells downgradient from Ault Field, Area 6, and OLF Coupeville since November 2016 (**Table 1**). From November 2016 to October 2017, initial investigative drinking water sampling for PFAS was conducted for drinking water wells downgradient of identified Priority 1 sites at Ault Field and OLF Coupeville (CH2M, 2017a). Following the initial drinking water sampling investigation, a biannual drinking water sampling program was conducted from October 2017 to April 2019 for drinking water wells with exceedances of the USEPA

1 The 1996 Safe Drinking Water Act amendments require that once every 5 years USEPA issue a new list of no more than 30 unregulated substances to be monitored by public water systems.

2 USEPA issued lifetime health advisories for PFOS and PFOA in May 2016, superseding the 2009 provisional lifetime health advisories. USEPA has not issued lifetime health advisories for any other PFAS.

lifetime health advisories and surrounding parcels near Ault Field and OLF Coupeville under the SAPs (CH2M, 2017b, 2018b). In fall 2019, off-Base locations near Area 6 were added to the biannual drinking water sampling program (CH2M, 2020a). The sampling program described in the present report is a continuation of the biannual sampling program (CH2M, 2020a), which occurred in fall 2021 (October and November).

Conceptual Site Model

This section presents a brief history of NAS Whidbey Island; background information about potential PFAS release areas at Ault Field, Area 6, and OLF Coupeville; a description of the environmental setting; and an evaluation of drinking water sources in the vicinity. This information comprises the conceptual site model, which describes the relationship between potential on-Base PFAS sources and receptors through potential or actual migration and exposure pathways.

Naval Air Station Whidbey Island Background

NAS Whidbey Island is comprised of three separate installations, Ault Field (includes Area 6), OLF Coupeville, and Seaplane Base (**Figure 1**). NAS Whidbey Island was commissioned on September 21, 1942, and currently supports several types of aircraft, 7,600 military personnel, and 1,300 civilian personnel. The mission of NAS Whidbey Island is to maintain and operate naval aircraft and aviation facilities and provide associated support. The land surrounding Ault Field, Area 6, and OLF Coupeville is used for various agricultural, recreational, residential, and industrial purposes (CH2M, 2020a).

Ault Field

Ault Field is located approximately 50 miles north of Seattle, Washington on Whidbey Island directly north of Oak Harbor, Washington (**Figure 1**). Ault Field supports Navy tactical electronic attack squadrons flying the EA-18G Growler, the P-3 Orion Maritime Patrol squadrons, and two Fleet Reconnaissance squadrons flying the EP-3E Aries.

In 2015, three areas where AFFF may have been stored, handled, or released at Ault Field (Hangar 5, the Runway Drainage Ditch System [Area 16] and Former Runway Fire School [Area 31]) were investigated within the shallow portion of the aquifer (**Figure 2**) (Navy, 2016a). Sample results indicated the presence of PFAS in groundwater near Hangar 5 and Area 31 (Navy, 2016a).

A preliminary assessment (PA) was conducted in 2018 at Ault Field and identified 35 potential PFAS release areas, including Hangar 5, Area 16, and Area 31 (CH2M, 2018a). Additionally, the PA identified Area 6 Landfill as a potential PFAS release area; however, PFAS at Area 6 was initially investigated independent of Ault Field and was treated as a separate area for the drinking water investigation prior to being combined into a biannual sampling program with Ault Field and OLF Coupeville in 2019.

In 2019, Phase 1 of a site inspection (SI) was conducted in areas between potential PFAS release areas and the 2 off-Base residential parcels near Ault Field where PFAS have been detected in drinking water above the USEPA lifetime health advisories and confirmed the presence of PFAS in groundwater at 4 of the 35 potential PFAS release areas (CH2M, 2019e) as follows:

- 1959-1969 Landfill (Area 2)
- 1968-1970 Landfill (Area 3)
- Current Firefighting School
- Former Clover Valley Fire School (Area 29)

Phase 2 of the SI was conducted in fall and winter 2019 and summer 2020 to further refine the conceptual site model and identify PFAS release areas and migration pathways for the remaining potential PFAS release areas identified in the PA (CH2M, 2021b). The Phase 2 SI involved additional on-Base monitoring well installation, PFAS soil and groundwater sampling, and aquifer testing near potential PFAS release areas at Ault Field (CH2M, 2021b).

This Phase 2 SI confirmed the presence of PFAS in groundwater at 26 potential PFAS release areas. A Remedial Investigation (RI) at the Former Runway Fire School (Area 31) is planned for spring/summer 2022 and an RI at the Current Firefighting School is planned for fall 2022.

Area 6

Area 6 is a 260-acre tract in the southeastern corner of Ault Field (**Figure 1**). Area 6 is bordered by Ault Field Road to the north, State Highway 20 to the east, and the Oak Harbor landfill on the south and southwest. Privately owned forested or logged land, and a former commercial sand and gravel quarry operation, are located immediately west of Area 6. Currently, Area 6 is mostly vacant and composed of a compost facility, an approximate 40-acre engineered landfill cap, and a stormwater detention basin. It also includes various groundwater monitoring and extraction wells and two groundwater treatment plants. The off-Base land surrounding Area 6 is used for a combination of residential and commercial purposes.

From 2017 to 2019, an SI and off-Base drinking water sampling investigation was conducted at Area 6 for PFAS (CH2M, 2020d). PFAS were detected in 17 groundwater monitoring wells located on-Base at Area 6. Of the 17 groundwater monitoring wells with PFAS detections, one exceeded the USEPA lifetime health advisory for PFOA. The drinking water investigation is summarized in the Previous Off-Base Drinking Water Investigation section. An RI at Area 6 is planned to begin in summer 2022.

Outlying Landing Field Coupeville

OLF Coupeville is a Navy airfield associated with NAS Whidbey Island, located 2 miles southeast of Coupeville, in Island County, Washington (**Figure 1**). It is composed of a paved runway oriented north-northwest to south-southeast. The paved runway is approximately 5,400 feet long and is bordered by grass maintained by mowing operations extending to the public roads. A runway safety area extends approximately 3,300 feet south of the runway footprint and is bordered by trees and residential parcels. The airfield was commissioned for use by the Navy in 1943 and provides support for day and night field carrier landing practice operations by the Navy for aircraft based out of NAS Whidbey Island.

In 2016, PFAS were first detected in one of the on-Base drinking water wells located in the southwest portion of OLF Coupeville near Building 2807 during groundwater sampling activities conducted under the Navy's June 2016 Policy Memo (Navy, 2016b). As a result, an expedited SI was conducted, and 31 groundwater monitoring wells were installed and sampled for PFAS in 2016 and 2017 (CH2M, 2019d). Of the 31 groundwater monitoring wells, PFAS were detected in 13 of the wells and PFOS and/or PFOA exceeded the USEPA lifetime health advisories in 6 of the 13 groundwater monitoring wells.

In 2018, a PA was conducted for OLF Coupeville and identified two potential PFAS release areas, Building 2709 (Crash Truck Shelter) and Facilities 1, 2, and 11 (Control Tower, Airfield Operations Building, and Potable Water Well Pump House). As a result of the PA findings and the expedited SI results, a supplemental SI was conducted at OLF Coupeville in spring 2020 to further refine the conceptual site model and identify PFAS source areas and migration pathways. The supplemental SI involved monitoring well installation, soil and groundwater sampling, and aquifer testing (CH2M, 2021c). An RI at OLF Coupeville is planned for winter 2022.

Previous Off-Base Drinking Water Investigations

Off-base drinking water sampling near Ault Field and OLF Coupeville was initially conducted from November 2016 to June 2017 (CH2M, 2019b, 2019c). Sampling was conducted under a phased, voluntary sampling program (**Figures 2** and **3**). The initial sampling areas[3] included off-Base drinking water wells within a 1-mile radius in all

[3] Subsequent to the initial round of drinking water sampling performed in 2016 and 2017, a preliminary assessment (CH2M, 2018a) was conducted at Ault Field and identified 35 potential release areas (including Area 6) with suspected or potential releases requiring further investigation. The initial 1-mile downgradient boundary and subsequent 0.5-mile step-outs defined in the 2016 and 2017 investigation were established from Area 16, Area 31, and the Current Fire Training School; however, the sampling areas also encompass residences within the 1-mile downgradient direction of potential PFAS release areas identified in the PA.

directions of sites with suspected or confirmed usage of AFFF. Subsequent sampling phases were implemented with expanded sampling areas based on the results of previous phases. Three sampling phases were conducted in areas adjacent to Ault Field, during which PFOS and/or PFOA were detected above the USEPA lifetime health advisories in two off-Base wells. In response to PFAS detections in a stormwater drain near Hangar 6 and in an associated stormwater drainage system, a fourth sampling phase was conducted from January to February 2019, during which no additional off-Base drinking water wells exceeded the USEPA lifetime health advisories for PFOS and/or PFOA. Two sampling phases were conducted in areas adjacent to OLF Coupeville, during which PFOS and/or PFOA were detected above the USEPA lifetime health advisories in seven off-Base wells.

Beginning in October 2017, a biannual sampling program was implemented for Ault Field and OLF Coupeville that included all off-Base drinking water wells that had previously had detections of PFOS and/or PFOA (either above or below the USEPA lifetime health advisories) and wells on parcels adjacent to those with wells that had previously exceeded the USEPA lifetime health advisories for PFOS and/or PFOA. These adjacent properties included some wells that had not previously been sampled during the phased investigation. During the October 2017 event, PFOA was detected above the USEPA lifetime health advisory in a well on one of these properties in Coupeville that had not previously been sampled for a total number of eight drinking water wells above the USEPA lifetime health advisories in Coupeville.

From February 2018 to April 2019, the Navy conducted drinking water sampling at residences near Area 6 (CH2M, 2020d). Drinking water sampling results from this investigation indicated that PFOS and/or PFOA are present above the USEPA lifetime health advisories in five drinking water wells. In November 2019, an additional drinking water well with PFOS and the sum of PFOS and PFOA present above the USEPA lifetime health advisories was identified for a total of six drinking water wells above the USEPA lifetime health advisories near Area 6.

Temporary interim solution measures have been taken to supply potable water to residences where the drinking water results exceeded the USEPA lifetime health advisories. For most residences, this consists of bottled water delivery, which commenced in December 2016 and is ongoing. At one of the residences, a point-of-use water treatment system was installed in May 2018, which treats the impacted well water at one kitchen sink to non-detectable levels of PFOS and PFOA and provides potable water to the residence (CH2M, 2019a). This residence no longer receives bottled water. Additionally, seven residences near OLF Coupeville (three residences with single party wells and four residences that share multi-party wells) were connected to Town of Coupeville water in March 2020. These residences will continue to receive bottled water until final project acceptance.

Geology and Hydrogeology

Ault Field and Area 6

Whidbey Island lies within the Puget Lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range. The surface soil in the vicinity of Ault Field and Area 6 primarily consists of artificial fill, post-glacial deposits, glaciomarine drift, and glacial deposits. Artificial fill, consisting of coarse- or fine-grained material, underlies the runway areas. Post-glacial deposits, consisting of peaty sand and silt, are generally found in the low-lying marshy areas (Navy, 1994).

There are three main aquifers that underlie Ault Field and Area 6 that are referred to as the shallow aquifer, intermediate aquifer, and sea-level aquifer. Ault Field is located in a valley, with elevated areas to the southwest, northeast, and southeast of the field. In general, groundwater flow in the shallow aquifer mimics topography. In the northwestern portion of Ault Field, groundwater in the shallow aquifer flows to the west-northwest toward the Strait of Juan de Fuca (Navy, 1994). Across the remainder of Ault Field, east of the runway, groundwater generally flows to the east, northeast, and southeast toward Clover Valley Stream, Clover Valley Lagoon, and Dugualla Bay. West of the runway and current Firefighting School, there is likely a component of flow to the west toward the Strait of Juan de Fuca. Groundwater flow direction in the intermediate and deep aquifers at Ault Field is not well known because of limited monitoring wells screened within the intermediate and deep aquifers.

At Area 6, groundwater in the shallow aquifer predominantly flows to the south; however, there is a potential local southwesterly component of groundwater flow in the northwestern corner of Area 6. Groundwater flow direction in the intermediate aquifer at Area 6 is predominantly to the southeast, while groundwater flow direction within the deep aquifer ranges from the southeast to southwest (URS, 1993).

Outlying Landing Field Coupeville

Surficial geology at OLF Coupeville consists of the Partridge Gravel, which is composed of sand, gravel, and sand-gravel mixtures with minor inter-layered silt and silty sand. Bedding planes in the formation generally dip toward the west in the vicinity of OLF Coupeville. Undivided Pleistocene deposits lie beneath the Partridge Gravel. These deposits consist of poorly sorted, mildly compact sands (Polenz et al., 2005).

There are three designated hydrogeologic zones present beneath OLF Coupeville that are referred to as the shallow zone, intermediate zone, and deep zone (CH2M, 2018b). The shallow, intermediate, and deep elevation zone designations do not indicate three discrete aquifers or water-bearing zones. Rather, the shallow, intermediate, and deep elevation zones are located within the single aquifer system. Most local water supply wells are completed in the intermediate and deep elevation zones.

The dominant flow direction in the intermediate zone is to the southwest in the northern portion of the site, shifting to the south-southeast in the southern portion of the site. Groundwater flow in the deep zone is generally to the south. In general, the overall groundwater flow direction appears to be consistent regardless of tidal influence (CH2M, 2018b).

Migration Pathways and Potential Receptors and Exposure Routes

Previous investigations of Ault Field, Area 6, and OLF Coupeville have identified releases of PFAS to soil, groundwater, and stormwater in the areas. PFAS in groundwater and stormwater have migrated off-Base and may have resulted in exceedances of the USEPA lifetime health advisories for PFOS and/or PFOA in off-Base private drinking water wells.

Drinking Water Source Evaluation

Water for Ault Field is purchased from the City of Oak Harbor, which obtains its water from the City of Anacortes. The Washington Department of Ecology well database (n.d.) was used as the primary source for evaluating drinking water receptors off-Base, plus individual letters sent to off-Base property owners within the sampling areas. The Island County Environmental Health database was also used as a source for evaluating off-Base drinking water receptors. Multiple private and community drinking water wells were identified off-Base within 1 mile (or more, depending on drinking water investigation step-outs) of on-Base potential PFAS release areas during the initial drinking water source evaluation conducted as part of the voluntary phased drinking water sampling performed in 2016 and 2017 (CH2M, 2019b, 2020d). Off-Base drinking water wells are located in the phased off-Base sampling areas for Ault Field and Area 6 shown on **Figure 2**.

OLF Coupeville uses two drinking water wells located on-Base, screened within the deep zone of the regional aquifer (approximately 178 feet below ground surface), one well at Building 2807 and one well at Building 11. The Washington Department of Ecology well database (n.d.) was used as the primary source for evaluating drinking water receptors off-Base, plus individual letters sent to off-Base property owners within the sampling areas. Multiple private and community drinking water wells were identified off-Base within 1 mile of Building 2807, including the Town of Coupeville (Fort Casey well field and Keystone well) supply wells during the initial drinking water source evaluation conducted as part of the voluntary phased drinking water sampling performed in 2016 and 2017 (CH2M, 2019c). Off-Base drinking water wells are located in the phased off-Base sampling areas for OLF Coupeville shown on **Figure 3**.

The total number of drinking water wells sampled at least once near Ault Field, Area 6, and OLF Coupeville since 2016 is presented in **Table 1**.

Summary of Field Activities

This section provides a summary of field investigation activities conducted for the fall 2021 sampling event, including mobilization and dates of fieldwork, sampling activities, and sample packing and shipping procedures. All field activities were conducted in accordance with the standard operating procedures outlined in the SAP (CH2M, 2020a). Sample collection from private or community drinking water wells was conducted only at parcels where permission to collect samples was granted by the owner.

Mobilization

CH2M staff mobilized to Coupeville on September 16, 2021, to collect one of the drinking water well samples while performing the maintenance and monitoring of the residences point-of-use treatment system to limit the number of sampling appointments required from the property owner. CH2M staff mobilized to Whidbey Island for the majority of the sampling appointments on October 3, 2021. Scheduled sampling appointments occurred from October 4 through October 8, 2021, at locations in Oak Harbor and Coupeville. An additional mobilization to Whidbey Island occurred on November 5, 2021, to sample two wells that were not able to be sampled during the initial fall 2021 event in October 2021.

Summary of Sampling Activities

The following samples and associated field quality control samples were collected during the fall 2021 sampling event:

- 12 drinking water samples from off-Base drinking water wells near Ault Field
- 7 drinking water samples from off-Base drinking water wells near Area 6
- 21 drinking water samples from off-Base drinking water wells near OLF Coupeville

Samples were collected in accordance with the Standard Operating Procedure for *Drinking Water Sampling when Analyzing for PFAS*, provided in Appendix A of the SAP (CH2M, 2020a). Drinking water was collected from sample ports near the wells, outside spigots, or faucets inside the homes (if no faucets outside). Samples were collected directly into Trizma-preserved 250-milliliter, polypropylene sample bottles. Additional sample details are provided in **Tables 2** through **4**.

Quality control samples included field reagent blanks, field duplicates, and matrix spike/matrix spike duplicates.

Field reagent blanks were collected at each sampling location by transferring lab-certified PFAS-free water pre-preserved with Trizma (provided by the laboratory) into empty sample bottles. Field duplicates were collected in the same manner as regular samples at a rate of 1 per every 10 sample locations. Matrix spike/matrix spike duplicates were collected in the same manner as regular samples at a rate of 1 per every 20 sample locations.

Sample Packing and Shipping Procedures

Sample bottles were properly labeled, placed into resealable zipper storage bags, then placed into a heavy-duty garbage bag, which was placed into shipping coolers provided by the laboratory (Vista Analytical Laboratory). The coolers were then packed with ice. A temperature blank provided by the laboratory and the completed chains of custody (provided in **Attachment 1**) were included in each cooler. The coolers were shipped via FedEx priority overnight to the laboratory.

Summary of Sample Results

This section provides a brief discussion of the project action limits (PALs), as well as a summary of laboratory results for the drinking water samples collected for analysis of the following 18 PFAS listed in USEPA Method 537.1: PFOA, PFOS, PFBS, n-ethyl perfluorooctanesulfonamidoacetic acid (EtFOSAA), n-methyl perfluorooctanesulfonamidoacetic acid (MeFOSAA), perfluorodecanoic acid (PFDA), perfluorododecanoic acid

(PFDoA), perfluoroheptanoic acid (PFHpA), perfluorohexanesulfonic acid (PFHxS), perfluorohexanoic acid (PFHxA), perfluorononanoic acid (PFNA), perfluorotetradecanoic acid (PFTeDA), perfluorotridecanoic acid (PFTrDA), perfluoroundecanoic acid (PFUnA), hexafluoropropylene oxide dimer acid (HFPO-DA), 4,8-dioxa-3H-perfluorononanoic acid (ADONA), 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS), and 9-chlorohexadecafluoro-3-oxanone-1-sulfonic (9Cl-PF3ONS).

Project Action Limits

As indicated in the SAP (CH2M, 2020a), the PALs for this project are the USEPA lifetime health advisories for PFOA, PFOS, and the sum of PFOS + PFOA[4] (70 ng/L). Results are screened against the USEPA regional screening level (RSL) for PFBS (600 ng/L) (based on a hazard quotient of 0.1) (USEPA, 2021); however, no actions were to be taken if the results exceed the RSL. This RSL is provided for informational purposes only. EtFOSAA, MeFOSAA, PFDA, PFDoA, PFHpA, PFHxS, PFHxA, PFNA, PFTeDA, PFTrDA, PFUnA, HFPO-DA, ADONA, 11Cl-PF3OUdS, and 9Cl-PF3ONS currently do not have established screening values for comparison. Data are included as **Attachment 2** for future comparison if screening values are established.

Ault Field Sampling Results

A total of 12 drinking water samples were collected from off-Base drinking water wells near Ault Field during the fall 2021 biannual sampling event. Sampled wells included 11 single-residence drinking water wells and 1 multi-party drinking water well. Of the 12 samples collected during the fall 2021 event, 1 sample exceeded the PALs for PFOS and the sum of PFOS + PFOA. All samples collected were analyzed for 18 PFAS compounds using USEPA Method 537.1 in accordance with the SAP. A summary of detections and exceedances is provided in **Table 5** and a summary of PFOS and PFOA results for fall 2021 is shown on **Figure 4**. Raw data are provided in **Attachment 2**.

- **PFBS** – PFBS was detected in seven samples, ranging from 2.09 ng/L in sample WI-AF-1RW40-1021 to 276 ng/L in sample WI-AF-1RW32-1021. No samples exceeded the RSL for PFBS.
- **PFOS** – PFOS was detected in six samples, ranging from an estimated 0.783 J[5] ng/L in sample WI-AF-1RW77-1121 to 4,720 ng/L in sample WI-AF-1RW32-1021. The PFOS concentration in one sample (WI-AF-1RW32-1021) exceeded the PAL for PFOS.
- **PFOA** – PFOA was detected in six samples, ranging from 2.36 ng/L in sample WI-AF-1RW12P-1021 to 42.5 ng/L in sample WI-AF-1RW32-1021. No samples exceeded the PAL for PFOA.
- **PFOS + PFOA** – PFOS and PFOA were detected in six samples. The sum of PFOS + PFOA ranged from 3.65 ng/L in sample WI-AF-1RW12-1021 to 4,760 ng/L in sample WI-AF-1RW32-1021. The PFOS + PFOA concentrations in one sample (WI-AF-1RW32-1021) exceeded the PAL for PFOS + PFOA.

Area 6 Sampling Results

A total of seven drinking water samples were collected from off-Base drinking water wells near Area 6 during the fall 2021 biannual sampling event. Sampled wells included four single-residence drinking water wells, two multi-party drinking water wells, and one backup drinking water well. Of the seven samples collected during the fall 2021 event, three samples exceeded the PALs for PFOS and the sum of PFOS + PFOA. All samples collected were analyzed for the 18 PFAS compounds using USEPA Method 537.1 in accordance with the SAP. A summary of detections and exceedances is provided in **Table 6** and is shown on **Figure 4.** Raw data are provided in **Attachment 2**.

- **PFBS** – PFBS was detected in seven samples, ranging from 18.4 ng/L in sample WI-A06-RW08-1021 to 60.0 ng/L in sample WI-A06-RW19-1021. None of the detections of PFBS exceeded the RSL.

4 The PAL for the sum of PFOS and PFOA is only applicable if both PFOS and PFOA are detected in the sample.

5 The analyte was positively identified; the quantitation is an estimation.

- **PFOS** – PFOS was detected in seven samples, ranging from 12.7 ng/L in sample WI-A06-RW04-1021 to 247 ng/L in sample WI-A06-RW24-1121. The PFOS concentrations in four samples (WI-A06-RW05-1021, WI-A06-RW08-1021, WI-A06-RW19-1021, and WI-A06-RW24-1121) exceeded the PAL for PFOS.
- **PFOA** – PFOA was detected in seven samples, ranging from 9.03 ng/L in sample WI-A06-RW04-1021 to 59.8 ng/L in sample WI-A06-RW24P-1121. None of the detections of PFOA exceeded the PAL.
- **PFOS + PFOA** – Both PFOS and PFOA were detected in seven samples. The sum of PFOS + PFOA ranged from 21.7 ng/L in sample WI-A06-RW04-1021 to 303 ng/L in sample WI-A06-RW24P-1121. PFOS + PFOA concentrations in four samples (WI-A06-RW05-1021, WI-A06-RW08-1021, WI-A06-RW19-1021, and WI-A06-RW24) exceeded the PAL for PFOS + PFOA.

Outlying Landing Field Coupeville Sampling Results

A total of 21 drinking water samples were collected from off-Base drinking water sources near OLF Coupeville during the fall 2021 biannual sampling event. Sampled locations included 15 single-residence drinking water wells, 1 multi-party drinking water well, 4 Town of Coupeville water supply wells, and 1 sample taken from a post-treatment location at the Town of Coupeville water treatment plant. Of the 21 samples collected during the fall 2021 event, 6 samples exceeded the PAL for PFOA and 5 samples exceeded the PAL for the sum of PFOS + PFOA. All samples collected were analyzed for 18 PFAS compounds using USEPA Method 537.1 in accordance with the SAP. A summary of detections and exceedances are provided in **Table 7** and a summary of PFOS and PFOA results are shown on **Figure 5**. Raw data are provided in **Attachment 2**.

- **PFBS** – PFBS was detected in 10 samples, ranging from an estimated 1.79 J ng/L in sample WI-CV-1RW72-1021 to 195 ng/L in sample WI-CV-3RW10-1021. None of the detections of PFBS exceeded the RSL.
- **PFOS** – PFOS was detected in 7 samples, ranging from an estimated 0.873 J ng/L in sample WI-CV-2RW06-1021 to 17.8 ng/L in sample WI-CV-2RW04-1021. None of the detections exceeded the PAL for PFOS.
- **PFOA** – PFOA was detected in 10 samples, ranging from an estimated 0.879 J ng/L in sample WI-CV-1RW72-1021 to 363 ng/L in sample WI-CV-2RW02-1021. The PFOA concentrations in 6 samples (WI-CV-1RW01-1021, WI-CV-1RW07-1021, WI-CV-1RW90-0921, WI-CV-2RW02-1021, WI-CV-2RW06-1021, and WI-CV-3RW10-1021) exceeded PAL for PFOA.
- **PFOS + PFOA** – PFOS and PFOA were detected in 7 samples. The sum of PFOS + PFOA ranged from 26.5 ng/L in sample WI-CV-2RW04-1021 to 298 ng/L in sample WI-CV-2RW06-1021. The PFOS + PFOA concentrations in 5 samples (WI-CV-1RW01-1021, WI-CV-1RW07-1021, WI-CV-1RW90-0921, WI-CV-2RW06-1021, and WI-CV-3RW10-1021) exceeded the PAL for PFOs + PFOA.

Data Quality Summary

No quality control deficiencies were found that resulted in rejected data points; all data are available for use. The Data Validation Summary Reports are provided in **Attachment 3**.

A double-blind proficiency test (PT) sample was analyzed during the spring 2020 sampling event. A third-party subcontractor provided a sample spiked with three PFAS compounds (PFBS, PFOA, and PFOS) of known concentrations in laboratory sample bottles. The PT sample was submitted to the laboratory in the same fashion as a field sample along with a corresponding field reagent blank sample containing PT reagent water pre-preserved with Trizma. The PT sample was assigned a label consistent with other field samples to ensure a blind analysis. Recovery of the three spiked PFAS compounds met the acceptance criteria listed on the certificate of analysis provided by the PT provider. The lab reported PFBS at 52.5 ng/L with a certified value of 49.5 ng/L and acceptance range of 29.7 to 69.3 ng/L. PFOS was reported at 24.2 ng/L with a certified value of 25.1 ng/L and acceptance range of 15.1 to 35.1 ng/L. PFOA was reported by the lab at 50.5 ng/L with a certified value of 50.2 ng/L and acceptance range of 30.1 to 70.3 ng/L. Overall, the PT sample results met acceptance criteria.

Trend Analysis

This section provides a brief discussion of trends observed in drinking water samples collected near Ault Field, Area 6, and OLF Coupeville during the 5-year monitoring period since the initiation of PFAS drinking water sampling in 2016. Well trend graphs[6] depicting PFOA, PFOS, and the sum of PFOS + PFOA from 2016 to 2021 are presented in **Attachment 4**. Mann-Kendall trend analysis (Mann, 1945; Kendall, 1975; Gilbert, 1987) was performed on the sum of PFOS + PFOA, PFOS, and PFOA for drinking water well locations with at least four detections over the course of the 5-year monitoring period. Summary statistics (mean, median, standard deviation, and coefficient of variation) were calculated using the Kaplan-Meier product-limit estimator (Kaplan and Meier 1958) for nondetects with the censoring limit set at the limit of detection.

The Mann-Kendall test is a statistical test widely used for the analysis of trend in the environmental sciences. The test is a nonparametric procedure used to assess if there is a monotonic upward or downward trend of the variable of interest over time. Results of the Mann-Kendall trend analysis are presented in **Tables 8, 9,** and **10,** and a detailed description of the statistical basis for Mann-Kendall trend evaluation is provided in **Attachment 5**. Figures showing individual parcels with historical detections, exceedances, and statistical trends are provided in **Attachment 6**.

Ault Field

Mann-Kendall analysis was performed on five drinking water wells near Ault Field that have had at least four detections for PFOS (**Table 8**), five drinking water wells near Ault Field that have had at least four detections for PFOA (**Table 9**), and five drinking water wells near Ault Field that have had at least four detections for the sum of PFOS + PFOA (**Table 10**). The following are results of the Mann-Kendall analysis:

PFOS

- Four of the five drinking water wells (WI-AF-1RW40, WI-AF-3RW41, WI-AF-1RW32, and WI-AF-1RW28) indicate an increasing trend for PFOS with greater than 95 percent confidence. The drinking water well associated with WI-AF-1RW32 has an historical exceedance for PFOS. There has been significant fluctuation in the concentrations of PFOS in drinking water well WI-AF-1RW32 suggesting that the trend may not be stable. Furthermore, the short-term trend for WI-AF-1RW32 from the sample collected in spring 2021 to the sample collected in fall 2021 shows a sharp decrease in PFOS concentrations. The PFOS concentrations for the three other wells with increasing trends remain relatively low in relation to the USEPA lifetime health advisory (maximum concentration is 16.9 ng/L for WI-AF-3RW41 well).
- One of the five drinking water wells (WI-AF-1RW12) does not indicate a statistically significant upward or downward trend for PFOS.
- Drinking water samples have historically been collected from four drinking water wells located on parcels adjacent to historical PFOS exceedances near Ault Field. Drinking water results from the four wells have remained nondetect for PFOS.

PFOA

- One of the five drinking water wells (WI-AF-1RW32) indicates an increasing trend for PFOA with greater than 95 percent confidence. The drinking water well associated with WI-AF-1RW32 has an historical exceedance for PFOA. There has been significant fluctuation in the concentrations of PFOA in drinking water well WI-AF-1RW32 suggesting that the trend may not be stable. Furthermore, the short-term trend for WI-AF-1RW32 from the sample collected in spring 2021 to the sample collected in fall 2021 shows a sharp decrease in PFOA concentrations.

6 Individual trend graphs are not provided for drinking water wells with only one sample collected over the 5-year monitoring period.

- One of the five drinking water wells (WI-AF-1RW40) indicates a decreasing trend for PFOA with greater than 95 percent confidence. The drinking water well associated with WI-AF-1RW40 has an historical exceedance for PFOA.
- Three of the five drinking water wells (WI-AF-1RW28, WI-AF-1RW12, and WI-AF-3RW41) do not indicate a statistically significant upward or downward trend for PFOA.
- Drinking water samples have historically been collected from six drinking water wells located on parcels adjacent to historical PFOA exceedances near Ault Field. The concentrations observed in the six wells have either remained nondetect for PFOA or the concentrations do not indicate a significant trend over the 5-year monitoring period.

Sum of PFOS + PFOA

- Two of the five drinking water wells (WI-AF-3RW41 and WI-AF-1RW32) indicate an increasing trend for the sum of PFOS + PFOA with greater than 95 percent confidence. The drinking water well associated with WI-AF-1RW32 has an historical exceedance for the sum of PFOS and PFOA. There has been significant fluctuation in the concentrations of the sum of PFOS + PFOA in drinking water well WI-AF-1RW32 suggesting that the trend may not be stable. Furthermore, the short-term trend for WI-AF-1RW32 from the sample collected in spring 2021 to the sample collected in fall 2021 shows a sharp decrease in the sum of PFOS + PFOA concentrations. The sum of PFOS+PFOA for WI-AF-3RW41 remains low in relation to the USEPA lifetime health advisory (maximum concentration is 22.9 ng/L).
- One of the five drinking water wells (WI-AF-1RW40) indicates a decreasing trend for the sum of PFOS + PFOA with greater than 95 percent confidence. The drinking water well associated with WI-AF-1RW40 has an historical exceedance for the sum of PFOS and PFOA.
- Two of the five drinking water wells (WI-AF-1RW28 and WI-AF-1RW12) do not indicate a statistically significant upward or downward trend for the sum of PFOS + PFOA.
- Drinking water samples have historically been collected from six drinking water wells located on parcels adjacent to historical sum of PFOS + PFOA exceedances near Ault Field. The concentrations observed in the six wells have either remained nondetect for the sum of PFOS + PFOA or the concentrations do not indicate a significant trend over the 5-year monitoring period.

Mann-Kendall Conclusions

Based on the Mann-Kendall trend analysis of drinking water well results from 2016 to 2021, temporal variability in PFOS and/or PFOA detections and exceedances at Ault Field is minimal and there is no apparent temporal trend in spatial distribution of PFOS and/or PFOA (that is, the extent of PFOS and/or PFOA does not appear to be expanding).

Area 6

Mann-Kendall analysis was performed on nine drinking water wells near Area 6 that have had at least four detections for PFOS (**Table 8**), nine drinking water wells near Area 6 that have had at least four detections for PFOA (**Table 9**), and nine drinking water wells near Area 6 that have had at least four detections for the sum of PFOS + PFOA (**Table 10**). The following are results of the Mann-Kendall analysis:

PFOS

- Two of the nine drinking water wells (WI-A06-RW04 and WI-A06-RW14) indicate an increasing trend for PFOS with greater than 95 percent confidence. Neither drinking water well has had an historical exceedance for PFOS.

- Seven of the nine drinking water wells (WI-A06-RW03, WI-A06-RW05, WI-A06-RW08, WI-A06-RW18, WI-A06-RW19, WI-A06-RW20, and WI-A06-RW24) do not indicate a statistically significant upward or downward trend for PFOS. The drinking water wells associated with WI-A06-RW05, WI-A06-RW08, WI-A06-RW19, and WI-A06-RW24 have historical exceedances for PFOS.
- Drinking water samples have historically been collected from three drinking water wells located on parcels adjacent to historical PFOS exceedances near Area 6. The concentrations observed in one of the three wells do not indicate a significant trend for PFOS over the 5-year monitoring period. However, two of the three wells (WI-A06-RW04 and WI-A06-RW14) indicate an increasing trend for PFOS with greater than 95 percent confidence.

PFOA

- Two of the nine drinking water wells (WI-A06-RW04 and WI-A06-RW20) indicate an increasing trend for PFOA with greater than 95 percent confidence. Neither drinking water well has had an historical exceedance for PFOA. The PFOA concentrations for the two wells with increasing trends remain relatively low in relation to the USEPA lifetime health advisory (maximum concentration is 9.03 ng/L for AW-A06-RW04 well).
- One of the nine drinking water wells (WI-A06-RW05) indicates a decreasing trend for PFOA with greater than 95 percent confidence. The drinking water well associated with WI-A06-RW05 has not had an historical exceedance for PFOA.
- Six of the nine drinking water wells (WI-A06-RW03, WI-A06-RW08, WI-A06-RW14, WI-A06-RW18, WI-A06-RW19, and WI-A06-RW24) do not indicate a statistically significant upward or downward trend for PFOA.
- There have not been any historical PFOA exceedances in drinking water wells near Area 6.

Sum of PFOS + PFOA

- Three of the nine drinking water wells (WI-A06-RW04, WI-A06-RW14, and WI-A06-RW19) indicate an increasing trend for the sum of PFOS and PFOA with greater than 95 percent confidence. The drinking water well associated with WI-AF-RW19 has a historical exceedance for the sum of PFOS + PFOA. The sums of PFOS+PFOA in the two remaining wells with increasing trends remain relatively low in relation to the USEPA lifetime health advisory (maximum concentration is 42.2 ng/L for WI-A06-RW04 well).
- Six of the nine drinking water wells (WI-A06-RW03, WI-A06-RW05, WI-A06-RW08, WI-A06-RW18, WI-A06-RW20, WI-A06-RW24) do not indicate a statistically significant upward or downward trend. The drinking water wells associated with WI-A06-RW05, WI-A06-RW08, WI-A06-RW18, WI-A06-RW19, WI-A06-RW20, and WI-A06-RW24 have historical exceedances for the sum of PFOS + PFOA.
- Drinking water samples have historically been collected from three drinking water wells located on parcels adjacent to historical sum of PFOS + PFOA exceedances near Area 6. The concentrations observed in one of the three wells do not indicate a significant trend for the sum of PFOS + PFOA over the 5-year monitoring period. However, two of the three wells (WI-A06-RW04 and WI-A06-RW14) indicate an increasing trend for the sum of PFOS and PFOA with greater than 95 percent confidence.
- Although PFOS + PFOA concentration at well WI-A06-RW03 does not have a statistically significantly increasing trend, the PFOS + PFOA concentration at this well (63.3 ng/L) is approaching the USEPA lifetime health advisory.

Mann-Kendall Conclusions

Based on the drinking water well results from 2016 to 2021, spatial variability in PFOS and/or PFOA detections and exceedances at Area 6 is minimal. However, PFOS and sum of PFOS + PFOA detections in two drinking water wells located on residences adjacent to PFOS and sum of PFOS + PFOA exceedances indicate a significant increasing trend over the 5-year monitoring period, which suggests that spatial plume expansion of the PFOS component may be occurring. In the drinking water wells with increasing trends for PFOS and the sum of PFOS + PFOA, the

maximum PFOS and sum of PFOS + PFOA detections are less than 17 ng/L and 42.2 ng/L, respectively. The maximum concentrations in the two wells are below the USEPA lifetime health advisory of 70 ng/L for PFOS and the sum of PFOS + PFOA. Although the sum of PFOS + PFOA at WI-A06-RW03 does not have a statistically significantly increasing trend, the sum of PFOS + PFOA at this well (63.3 ng/L) is approaching the USEPA lifetime health advisory. The Navy will pay close attention to this well in future monitoring events to ensure bottled water is provided if the well exceeds 70 ng/L.

Outlying Landing Field Coupeville

Mann-Kendall analysis was performed on 7 drinking water wells near OLF Coupeville that have had at least 4 detections for PFOS (**Table 8**), 12 drinking water wells near OLF Coupeville that have had at least 4 detections for PFOA (**Table 9**), and 12 drinking water wells near OLF Coupeville that have had at least 4 detections for the sum of PFOS + PFOA (**Table 10**). The following are results of the Mann-Kendall analysis:

PFOS

- Three of the seven drinking water wells (WI-CV-1RW07, WI-CV-1RW90, and WI-CV-3RW10) indicate an increasing trend for PFOS with greater than 95 percent confidence. None of the three wells have had historical exceedances for PFOS. The PFOS concentration for the three wells remains relatively low in relation to the USEPA lifetime health advisory (maximum is 15.5 ng/L for WI-CV-1RW90 well).
- Four of the seven drinking water wells (WI-CV-1RW01, WI-CV-1RW23, WI-CV-2RW04, and WI-CV-3RW11) do not indicate a statistically significant upward or downward trend for PFOS.
- There have not been any historical PFOS exceedances in drinking water wells near OLF Coupeville.

PFOA

- One of the 12 drinking water wells (WI-CV-2RW02) indicates an increasing trend for PFOA with greater than 95 percent confidence. The drinking water well associated with WI-CV-2RW02 has an historical exceedance for PFOA.
- Five of the 12 drinking water wells (WI-CV-1RW01, WI-CV-1RW27, WI-CV-1RW34, WI-CV-2RW04, and WI-CV-3RW11) indicate a decreasing trend for PFOA with greater than 95 percent confidence. The drinking water wells associated with WI-CV-1RW01, WI-CV-1RW34, WI-CV-1RW90, WI-CV-2RW06, and WI-CV-3RW11 have historical exceedances for PFOA.
- Six of the 12 drinking water wells (WI-CV-1RW07, WI-CV-1RW23, WI-CV-1RW72, WI-CV-1RW90, WI-CV-2RW06, and WI-CV-3RW10) do not indicate a statistically significant upward or downward trend for PFOA. The drinking water wells associated with WI-CV-1RW07, WI-CV-1RW23, WI-CV-1RW90, WI-CV-2RW06, and WI-CV-3RW10 have historical exceedances for PFOA.
- Drinking water samples have historically been collected from 14 drinking water wells located on parcels adjacent to historical PFOA exceedances near OLF Coupeville. The concentrations observed in the 13 of the wells have either remained nondetect for PFOA or the concentrations do not indicate a significant trend over the 5-year monitoring period. The concentrations in 1 of the 14 wells (WI-CV-1RW27) indicate a decreasing trend for PFOA with greater than 95 percent confidence.

Sum of PFOS + PFOA

- One of the 12 drinking water wells (WI-CV-2RW02) indicates an increasing trend for the sum of PFOS + PFOA with greater than 95 percent confidence. The drinking water well associated with WI-CV-2RW02 has an historical exceedance for the sum of PFOS and PFOA.
- Four of the 12 drinking water wells (WI-CV-1RW01, WI-CV-3RW11, WI-CV-1RW34, and WI-CV-1RW27) indicate a decreasing trend for the sum of PFOS + PFOA with greater than 95 percent confidence. The drinking

water wells associated with WI-CV-1RW01, WI-CV-3RW11, and WI-CV-1RW34 have historical exceedances for the sum of PFOS + PFOA.

- Seven of the 12 drinking water wells (WI-CV-1RW07, WI-CV-3RW10, WI-CV-1RW72, WI-CV-1RW90, WI-CV-2RW04, WI-CV-2RW06, and WI-CV-1RW23) do not indicate a statistically significant upward or downward trend. The drinking water wells associated with WI-CV-1RW07, WI-CV-3RW10, WI-CV-1RW90, W-CV-2RW06, and WI-CV-1RW23 have historical exceedances for the sum of PFOS + PFOA.
- Drinking water samples have historically been collected from 14 drinking water wells located on parcels adjacent to historical sum of PFOS + PFOA exceedances near OLF Coupeville. Drinking water results from 13 of the wells have either remained nondetect for the sum of PFOS + PFOA or the concentrations do not indicate a significant trend over the 5-year monitoring period. The concentrations in 1 of the 14 wells (WI-CV-1RW27) indicate a decreasing trend for the sum of PFOS + PFOA with greater than 95 percent confidence.

Mann-Kendall Conclusions

Based on the drinking water well results from 2016 to 2021, spatial variability in PFOS and/or PFOA detections and exceedances at OLF Coupeville is minimal and there is no apparent temporal trend in spatial distribution of PFOS and/or PFOA (in other words, the extent of PFOS and/or PFOA does not appear to be expanding).

Conclusions

The results of the continued biannual monitoring program for the fall 2021 sampling event supports the following conclusions:

- Concentrations in 11 off-Base drinking water wells exceed the USEPA lifetime health advisories for PFOS, PFOA, and/or the sum of PFOS + PFOA.
- Concentrations in 29 off-Base drinking water wells are below the USEPA lifetime health advisories for PFOS, PFOA, and/or the sum of PFOS + PFOA.
- There were no drinking water wells with PFBS concentrations above the USEPA tapwater RSL (USEPA, 2021).
- Trend analysis over the monitoring period indicates that there are both increasing and decreasing trends for the sum of PFOS + PFOA, PFOS, and PFOA concentrations in certain drinking water wells above and below the USEPA lifetime health advisory near Ault Field and OLF Coupeville, but not in wells on parcels adjacent to the exceedances. Because there are no statistically significant increasing or decreasing trends in drinking water wells on parcels adjacent to exceedances, there is no indication of spatial or temporal trends suggesting plume migration or seasonal fluctuation for the sum of PFOS + PFOA, PFOS, and PFOA in drinking water wells near Ault Field or OLF Coupeville.
- Trend analysis of the sum of PFOS + PFOA and PFOS indicates that two drinking water wells adjacent to exceedances at Area 6 (WI-A06-RW04 and WI-A06-RW14) exhibit an increasing trend for the sum of PFOS + PFOA and PFOS, which suggests that spatial plume expansion of the PFOS component may be occurring. The maximum concentrations are below the USEPA lifetime health advisory with maximum concentrations for the sum of PFOS + PFOA of 21.7 ng/L (WI-A06-RW04) and 43.6 ng/L (WI-A06-RW14) and yield nonparametric Theil-Sen slope estimates of 6.0 ng/L per year (WI-A06-RW04) and 4.2 ng/L (WI-A06-RW14) per year. Assuming the increasing trend remains constant, neither location would exceed the lifetime health advisory within the next 6 years.
- Although sum of PFOS + PFOA at WI-A06-RW03 does not have a statistically significantly increasing trend, the sum of PFOS + PFOA at this well (63 ng/L) is approaching the USEPA lifetime health advisory. The Navy will pay close attention to this well in future monitoring events to ensure bottled water is provided if the well exceeds 70 ng/L.

- The current frequency of drinking water sampling of twice per calendar year is sufficient for monitoring of drinking water wells.

Because of the continued detection of PFOS and/or PFOA in exceedance of USEPA lifetime health advisories in drinking water wells near NAS Whidbey Island, further investigation is ongoing to evaluate the on-Base source for detections in off-Base drinking water to evaluate offsite migration pathways of PFAS from Ault Field, Area 6, and OLF Coupeville. Off-Base investigation is ongoing to further determine the temporal and spatial variability and overall trends of PFAS in off-Base drinking water wells with previous PFAS detections and wells adjacent to PFAS exceedances. In accordance with the SAP, residences served by drinking water wells with PFAS exceedances will continue to receive alternate water sources until a long-term solution can be implemented.

Recommendations

Based upon the conclusions, the following path forward is recommended until a long-term solution is implemented or the Navy has remediated the PFOA/PFOS source and plume:

- Continue conducting biannual monitoring of residences with drinking water wells with PFAS detections and residences adjacent to PFOS and/or PFOA exceedances.
- Continue analyzing the samples for at least the 18 PFAS compounds listed in Method 537.1; the analyte list may be expanded as necessary in the future in accordance with Department of Defense policy.
- Re-evaluate the continuation of drinking water sampling for wells not located on properties adjacent to wells with historical exceedances that have had historical PFAS detections but more recently have had several consecutive nondetect results.

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Tables

Table 1. Total Wells Sampled 2016-2021 Summary

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

	Drinking Water Wells Sampled 2016-2021
Ault Field	150
Area 6	20
Coupeville	116
Total	**286**

Table 2. Ault Field Sample Summary

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Station ID	Sample ID	Sample Date/Time	QC Sample ID	Well Water Use
Fall 2021				
WI-AF-1RW01	WI-AF-1RW01-1021	10/4/21 11:56	WI-AF-1FB01-1021	Drinking
WI-AF-1RW12	WI-AF-1RW12-1021	10/4/21 10:50	WI-AF-1FB12-1021	Drinking
	WI-AF-1RW12P-1021	10/4/21 10:52		Drinking
WI-AF-1RW25	WI-AF-1RW25-1021	10/4/21 15:22	WI-AF-1FB25-1021	Drinking
WI-AF-1RW28	WI-AF-1RW28-1021	10/6/21 11:44	WI-AF-1FB28-1021	Drinking
WI-AF-1RW32	WI-AF-1RW32-1021	10/6/21 9:37	WI-AF-1FB32-1021	Drinking
WI-AF-1RW33	WI-AF-1RW33-1021	10/6/21 10:24	WI-AF-1FB33-1021	Drinking
WI-AF-1RW40	WI-AF-1RW40-1021	10/6/21 11:25	WI-AF-1FB40-1021	Drinking
WI-AF-1RW51	WI-AF-1RW51-1021	10/6/21 9:13	WI-AF-1FB51-1021	Drinking
WI-AF-1RW68	WI-AF-1RW68-1021	10/6/21 16:09	WI-AF-1FB68-1021	Drinking
WI-AF-1RW77	WI-AF-1RW77-1121	11/5/21 10:45	WI-AF-1FB77-1121	Drinking
WI-AF-3RW18	WI-AF-3RW18-1021	10/4/21 14:18	WI-AF-3FB18-1021	Drinking
WI-AF-3RW41	WI-AF-3RW41-1021	10/4/21 15:56	WI-AF-3FB41-1021	Drinking
	WI-AF-3RW41P-1021	10/4/21 15:58	WI-AF-3FB41-1021	Drinking

Notes:
AF - Ault Field

Table 3. Area 6 Sample Summary

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Station ID	Sample ID	Sample Date/Time	QC Sample ID	Well Water Use
Fall 2021				
WI-A06-RW03	WI-A06-RW03-1021	10/6/21 13:08	WI-A06-FB03-1021	Drinking
	WI-A06-RW03P-1021	10/6/21 13:10		Drinking
WI-A06-RW04	WI-A06-RW04-1021	10/6/21 13:42	WI-A06-FB04-1021	Drinking
WI-A06-RW05	WI-A06-RW05-1021	10/4/21 14:52	WI-A06-FB05-1021	Drinking
WI-A06-RW14	WI-A06-RW14-1021	10/6/21 10:59	WI-A06-FB14-1021	Drinking
WI-A06-RW08	WI-A06-RW08-1021	10/4/21 22:22	WI-A06-FB08-1021	Drinking
WI-A06-RW19	WI-A06-RW19-1021	10/7/21 13:11	WI-A06-FB19-1021	Drinking
WI-A06-RW24	WI-A06-RW24-1121	11/5/21 11:50	WI-A06-FB24-1121	Drinking
	WI-A06-RW24P-1121	11/5/21 11:52		Drinking

Notes:
A06 - Area 6

Table 4. OLF Coupeville Sample Summary

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Station ID	Sample ID	Sample Date/Time	QC Sample ID	Well Water Use
Fall 2021				
WI-CV-1RW01	WI-CV-1RW01-1021	10/5/2021 14:52	WI-CV-1FB01-1021	Drinking
WI-CV-1RW07	WI-CV-1RW07-1021	10/5/2021 10:16	WI-CV-1FB07-1021	Drinking
	WI-CV-1RW07P-1021	10/5/2021 10:18		Drinking
WI-CV-1RW14	WI-CV-1RW14-1021	10/5/2021 8:38	WI-CV-1FB14-1021	Drinking
WI-CV-1RW22	WI-CV-1RW22-1021	10/7/2021 11:09	WI-CV-1FB22-1021	Drinking
WI-CV-1RW23	WI-CV-1RW23-1021	10/7/2021 9:48	WI-CV-1FB23-1021	Drinking
WI-CV-1RW24	WI-CV-1RW24-1021	10/7/2021 9:27	WI-CV-1FB24-1021	Drinking
WI-CV-1RW25	WI-CV-1RW25-1021	10/7/2021 8:55	WI-CV-1FB25-1021	Drinking
WI-CV-1RW26	WI-CV-1RW26-1021	10/7/2021 9:11	WI-CV-1FB26-1021	Drinking
	WI-CV-1RW26P-1021	10/7/2021 9:13		Drinking
WI-CV-1RW27	WI-CV-1RW27-1021	10/7/2021 8:30	WI-CV-1FB27-1021	Drinking
WI-CV-1RW37	WI-CV-1RW37-1021	10/7/2021 11:52	WI-CV-1FB37-1021	Drinking
WI-CV-1RW40	WI-CV-1RW40-1021	10/5/2021 15:16	WI-CV-1FB40-1021	Drinking
WI-CV-1RW67	WI-CV-1RW67-1021	10/5/2021 17:21	WI-CV-1FB67-1021	Drinking
WI-CV-1RW72	WI-CV-1RW72-1021	10/7/2021 10:02	WI-CV-1FB72-1021	Drinking
WI-CV-1RW90	WI-CV-1RW90-0921	9/16/21 16:58	WI-CV-1FB90-0921	Drinking
WI-CV-2RW02	WI-CV-2RW02-1021	10/7/2021 9:11	WI-CV-2FB02-1021	Drinking
WI-CV-2RW04	WI-CV-2RW04-1021	10/5/2021 9:03	WI-CV-2FB04-1021	Drinking
WI-CV-2RW06	WI-CV-2RW06-1021	10/5/2021 14:20	WI-CV-2FB06-1021	Drinking
WI-CV-3RW04	WI-CV-3RW04-1021	10/8/2021 8:20	WI-CV-3FB04-1021	Drinking
WI-CV-3RW07	WI-CV-3RW07-1021	10/7/2021 10:21	WI-CV-3FB07-1021	Drinking
WI-CV-3RW10	WI-CV-3RW10-1021	10/5/2021 10:01	WI-CV-3FB10-1021	Drinking
WI-CV-3RW17	WI-CV-3RW17-1021	10/5/2021 10:35	WI-CV-3FB17-1021	Drinking

Notes:
CV - Coupeville

Table 5. Detections of PFAS in Drinking Water - Ault Field

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Station ID	**USEPA Lifetime Health Advisory (May 2016)**	**USEPA RSL HQ = 0.1 (May 2021)**	WI-AF-1RW12		WI-AF-1RW28	WI-AF-1RW32	WI-AF-1RW33	WI-AF-1RW40	WI-AF-3RW41		WI-AF-1RW77
Sample ID			WI-AF-1RW12-1021	WI-AF-1RW12P-1021	WI-AF-1RW28-1021	WI-AF-1RW32-1021	WI-AF-1RW33-1021	WI-AF-1RW40-1021	WI-AF-3RW41-1021	WI-AF-3RW41P-1021	WI-AF-1RW77-1121
Sample Date			10/4/21	10/4/21	10/6/21	10/6/21	10/6/21	10/6/21	10/4/21	10/4/21	11/5/21
Chemical Name											
Semivolatile Organic Compounds (NG/L)											
Perfluorobutanesulfonic acid (PFBS)	--	**600**	2.66	2.60	3.65	276	74.7	2.09	51.2	47.4	3.48
Perfluorooctane Sulfonate (PFOS)	**70**	--	1.15 J	1.29 J	1.25 J	**4,720**	1.45 U	4.90	16.9	18.6	0.783 J
Perfluorooctanoic acid (PFOA)	**70**	--	2.50	2.36	41.6	42.5	1.45 U	3.98	4.13	4.27	3.61
PFOA + PFOS[1]	**70**	--	3.65	3.65	42.9	**4,760**	NA	8.88	21.0	22.9	4.39

Notes:

Shading indicates detections

Bold indicates detection above lifetime health advisory or RSL

AF - Ault Field

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

NG/L - Nanograms per liter

NA - Not applicable

HQ - Hazard quotient

[1] PFOS and PFOA are summed only if both PFOS and PFOA are detected in the sample.

Table 6. Detections of PFAS in Drinking Water - Area 6

Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville

Station ID	**USEPA Lifetime Health Advisory (May 2016)**	**USEPA RSL HQ = 0.1 (May 2021)**	WI-A06-RW05	WI-A06-RW08	WI-A06-RW03		WI-A06-RW04	WI-A06-RW14	WI-A06-RW19	WI-A06-RW24	
Sample ID			WI-A06-RW05-1021	WI-A06-RW08-1021	WI-A06-RW03-1021	WI-A06-RW03P-1021	WI-A06-RW04-1021	WI-A06-RW14-1021	WI-A06-RW19-1021	WI-A06-RW24-1121	WI-A06-RW24P-1121
Sample Date			10/4/21	10/4/21	10/6/21	10/6/21	10/6/21	10/6/21	10/7/21	11/5/21	11/5/21
Chemical Name											
Semivolatile Organic Compounds (NG/L)											
Perfluorobutanesulfonic acid (PFBS)	--	**600**	22.0	18.4	42.7	45.3	36.0	59.1	60.0	23.6	25.0
Perfluorooctane Sulfonate (PFOS)	**70**	--	**82.2**	**77.1**	21.5	23.6	12.7	17.0	**95.6**	**247**	**243**
Perfluorooctanoic acid (PFOA)	**70**	--	49.6	21.4	41.4	39.7	9.03	25.5	42.2	54.9	59.8
PFOA + PFOS[1]	**70**	--	**132**	**98.5**	62.9	63.3	21.7	42.5	**138**	**302**	**303**

Notes:

Shading indicates detections

Bold indicates detection above lifetime health advisory

A06 - Area 6

NG/L - Nanograms per liter

HQ - Hazard quotient

[1] PFOS and PFOA are summed only if both PFOS and PFOA are detected in the sample.

Table 7. Detections of PFAS in Drinking Water - OLF Coupeville

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Station ID	**USEPA Lifetime Health Advisory (May 2016)**	**USEPA RSL HQ = 0.1 (May 2021)**	WI-CV-1RW01	WI-CV-1RW07		WI-CV-1RW23	WI-CV-1RW27	WI-CV-1RW72	WI-CV-1RW90	WI-CV-2RW02	WI-CV-2RW04
Sample ID			WI-CV-1RW01-1021	WI-CV-1RW07-1021	WI-CV-1RW07P-1021	WI-CV-1RW23-1021	WI-CV-1RW27-1021	WI-CV-1RW72-1021	WI-CV-1RW90-0921	WI-CV-2RW02-1021	WI-CV-2RW04-1021
Sample Date			10/5/21	10/5/21	10/5/21	10/7/21	10/7/21	10/8/21	9/16/21	10/8/21	10/5/21
Chemical Name											
Semivolatile Organic Compounds (NG/L)											
Perfluorobutanesulfonic acid (PFBS)	--	**600**	17.0	30.3	21.9	15.3	3.14	1.79 J	61.1	32.3	13.1
Perfluorooctane Sulfonate (PFOS)	**70**	--	1.37 J	2.05	2.05	1.34 J	1.44 U	1.42 U	15.5	1.44 U	17.8
Perfluorooctanoic acid (PFOA)	**70**	--	**140**	**218**	**160**	49.0	1.44 U	0.879 J	**208**	**363**	8.68
PFOA + PFOS[1]	**70**	--	**141**	**220**	**162**	50.3	NA	NA	**224**	NA	26.5

Notes:

Shading indicates detections

Bold indicates detection above lifetime health advisory

CV - Coupeville

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

NG/L - Nanograms per liter

NA - Not applicable

HQ - Hazard quotient

[1] PFOS and PFOA are summed only if both PFOS and PFOA are detected in the sample.

Table 7. Detections of PFAS in Drinking Water - OLF Coupeville

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Station ID	**USEPA Lifetime Health Advisory (May 2016)**	**USEPA RSL HQ = 0.1 (May 2021)**	WI-CV-2RW06	WI-CV-3RW04	WI-CV-3RW10
Sample ID			WI-CV-2RW06-1021	WI-CV-3RW04-1021	WI-CV-3RW10-1021
Sample Date			10/5/21	10/8/21	10/5/21
Chemical Name					
Semivolatile Organic Compounds (NG/L)					
Perfluorobutanesulfonic acid (PFBS)	--	**600**	48.0	1.43 U	195
Perfluorooctane Sulfonate (PFOS)	**70**	--	0.873 J	1.43 U	3.41
Perfluorooctanoic acid (PFOA)	**70**	--	**297**	2.16	**133**
PFOA + PFOS[1]	**70**	--	**298**	NA	**136**

Notes:

Shading indicates detections

Bold indicates detection above lifetime health advisory

CV - Coupeville

J - Analyte present, value may or may not be accurate or precise

U - The material was analyzed for, but not detected

NG/L - Nanograms per liter

NA - Not applicable

HQ - Hazard quotient

[1] PFOS and PFOA are summed only if both PFOS and PFOA are detected in the sample.

Table 8. Results of Mann-Kendall Analysis - PFOS

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Drinking Water Well	Samples Collected	PFOS Detections	% Detected	Minimum PFOS Detection	Maximum PFOS Detection	Mean	Median	Standard Deviation (SD)	Coefficient of Variation (CV)	Most Recent PFOS Detection	Most Recent Sample Month	Mann-Kendall Test Statistic (S)	Calculated Probability (p-value)	Slope	Result	Trend	Stability
WI-AF-1RW12	9	6	66.67	1.15	3.55	2.0917	2.63	0.8283	0.396	1.15	Oct-2021	3	0.4205	---	58% (+)	No Trend	Stable
WI-AF-1RW28	5	4	80	0.85	1.25	1.0075	0.969	0.1477	0.1466	1.25	Oct-2021	10	0.008	0.3504	99.2% (sig +)	Increasing	---
WI-AF-1RW32	9	9	100	538	46800	17211.8889	7690	19019.4034	1.105	4720	Oct-2021	18	0.038	10975.0338	96.2% (sig +)	Increasing	---
WI-AF-1RW40	9	7	77.78	1.1	4.9	3.5129	3.91	1.1165	0.3178	4.9	Oct-2021	23	0.009	1.0532	99.1% (sig +)	Increasing	---
WI-AF-3RW41	9	9	100	4.01	17.7	11.6289	10.5	5.1029	0.4388	16.9	Oct-2021	26	0.003	3.3664	99.7% (sig +)	Increasing	---
WI-A06-RW03	**6**	**6**	**100**	**7.59**	**21.5**	**15.365**	**16.1**	**4.5963**	**0.2991**	**21.5**	**Oct-2021**	**9**	**0.068**	**---**	**93.2% (+)**	**No Trend**	**Stable**
WI-A06-RW04	**6**	**6**	**100**	**2.21**	**12.7**	**6.0333**	**5.575**	**3.7955**	**0.6291**	**12.7**	**Oct-2021**	**13**	**0.008**	**3.5984**	**99.2% (sig +)**	**Increasing**	**---**
WI-A06-RW05	7	7	100	56.2	95.3	71.4857	64.2	13.7166	0.1919	82.2	Oct-2021	1	0.5	---	50% (+)	No Trend	Stable
WI-A06-RW08	5	5	100	77.1	95.7	83.04	82.1	7.4289	0.0895	77.1	Oct-2021	-3	0.325	---	67.5% (-)	No Trend	Stable
WI-A06-RW14	**6**	**6**	**100**	**7.68**	**17**	**12.975**	**13.9**	**3.9312**	**0.303**	**17**	**Oct-2021**	**15**	**0.001**	**2.8213**	**99.9% (sig +)**	**Increasing**	**---**
WI-A06-RW18	5	5	100	12.6	44.7	22.14	18	12.8272	0.5794	18.6	Nov-2020	-2	0.408	---	59.2% (-)	No Trend	Stable
WI-A06-RW19	7	7	100	73.8	99	88.7143	91.3	10.2878	0.116	95.6	Oct-2021	11	0.068	---	93.2% (+)	No Trend	Stable
WI-A06-RW20	5	5	100	27.4	32.5	29.82	30.5	2.1649	0.0726	32.5	Apr-2021	2	0.408	---	59.2% (+)	No Trend	Stable
WI-A06-RW24	5	5	100	189	247	222.4	225	25.036	0.1126	247	Oct-2021	6	0.117	---	88.3% (+)	No Trend	Stable
WI-CV-1RW01	4	4	100	1.37	2.89	2.1925	2.255	0.7441	0.3394	1.37	Oct-2021	0	0.625	---	37.5% (+)	No Trend	Stable
WI-CV-1RW07	9	5	55.56	1.04	3.24	2.048	3.24	0.7175	0.3504	2.05	Oct-2021	18	0.038	0.5225	96.2% (sig +)	Increasing	---
WI-CV-1RW23	4	4	100	1.34	1.51	1.4325	1.44	0.0699	0.0488	1.34	Oct-2021	-3	0.271	---	72.9% (-)	No Trend	Stable
WI-CV-1RW90	9	9	100	3.28	15.5	7.7311	9.01	4.2206	0.5459	15.5	Oct-2021	28	0.001	2.7719	99.9% (sig +)	Increasing	---
WI-CV-2RW04	10	9	90	11.1	29.6	17.016	17.7	6.4769	0.3806	17.8	Oct-2021	-9	0.242	---	75.8% (-)	No Trend	Stable
WI-CV-3RW10	10	6	60	1.18	3.41	2.16	2.91	0.6841	0.3167	3.41	Oct-2021	23	0.023	0.43	97.7% (sig +)	Increasing	---
WI-CV-3RW11	9	6	66.67	1.2	43	6.1698	1.92	13.0241	2.1109	1.85	Apr-2021	3	0.4205	---	58% (+)	No Trend	Not Stable

Notes:

Shading indicates detections and mean/median concentrations above the health advisory.

Bold indicates a well located on a parcel adjacent to a parcel with a well that has an historical PFOS detection above the health advisory.

A06 - Area 6

AF - Ault Field

CV - Coupeville

Table 9. Results of Mann-Kendall Analysis - PFOA

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Drinking Water Well	Samples Collected	PFOA Detections	% Detected	Minimum PFOA Detection	Maximum PFOA Detection	Mean	Median	Standard Deviation (SD)	Coefficient of Variation (CV)	Most Recent PFOA Detection	Most Recent Sample Month	Mann-Kendall Test Statistic (S)	Calculated Probability (p-value)	Slope	Result	Trend	Stability
WI-AF-1RW12	9	7	77.78	2.35	6.88	4.4644	5.02	1.7534	0.3927	2.5	Oct-2021	-1	0.5	---	50% (-)	No Trend	Stable
WI-AF-1RW28	**9**	**9**	**100**	**28.4**	**41.6**	**32.2778**	**30.3**	**4.4919**	**0.1392**	**41.6**	**Oct-2021**	**8**	**0.238**	**---**	**76.2% (+)**	**No Trend**	**Stable**
WI-AF-1RW32	9	9	100	5.99	306	113.4778	46.1	123.9466	1.0923	42.5	Oct-2021	22	0.012	66.4125	98.8% (sig +)	Increasing	---
WI-AF-1RW40	9	9	100	3.24	73.1	22.5878	13.9	23.1374	1.0243	3.98	Oct-2021	-32	0.000614693	-12.2542	99.9% (sig -)	Decreasing	---
WI-AF-3RW41	9	9	100	4.13	6.13	4.93	4.8	0.6373	0.1293	4.13	Oct-2021	-14	0.09	---	91% (-)	No Trend	Stable
WI-A06-RW03	6	6	100	27.9	41.4	35.4333	36.45	4.5284	0.1278	41.4	Oct-2021	9	0.068	---	93.2% (+)	No Trend	Stable
WI-A06-RW04	6	6	100	3.86	9.03	5.7333	5.19	2.1077	0.3676	9.03	Oct-2021	11	0.028	2.3272	97.2% (sig +)	Increasing	---
WI-A06-RW05	7	7	100	48.7	57.7	53.3	53.5	3.3853	0.0635	49.6	Oct-2021	-13	0.035	-2.3343	96.5% (sig -)	Decreasing	---
WI-A06-RW08	5	5	100	21.4	31.2	26.34	25.4	3.7267	0.1415	21.4	Oct-2021	-6	0.117	---	88.3% (-)	No Trend	Stable
WI-A06-RW14	6	6	100	21.8	27	24.6833	24.8	1.7093	0.0692	25.5	Oct-2021	8	0.102	---	89.8% (+)	No Trend	Stable
WI-A06-RW18	5	5	100	24.5	29.1	26.78	26.1	2.0229	0.0755	25.5	Nov-2020	-4	0.242	---	75.8% (-)	No Trend	Stable
WI-A06-RW19	7	7	100	41.4	48.6	45.0571	45.6	2.5297	0.0561	42.2	Oct-2021	7	0.191	---	80.9% (+)	No Trend	Stable
WI-A06-RW20	5	5	100	43.7	50.1	46.76	46.4	2.5076	0.0536	50.1	Apr-2021	8	0.042	2.0199	95.8% (sig +)	Increasing	---
WI-A06-RW24	5	5	100	44.9	57.2	52.42	53	4.6365	0.0884	54.9	Oct-2021	4	0.242	---	75.8% (+)	No Trend	Stable
WI-CV-1RW01	10	10	100	140	443	337.1	338	103.1692	0.306	140	Oct-2021	-34	0.0005	-59.3206	100% (sig -)	Decreasing	---
WI-CV-1RW07	10	10	100	96.1	334	200.41	219.5	74.1841	0.3702	218	Oct-2021	3	0.431	---	56.9% (+)	No Trend	Stable
WI-CV-1RW23	10	10	100	49	70.9	61.63	62.9	6.563	0.1065	49	Oct-2021	-9	0.242	---	75.8% (-)	No Trend	Stable
WI-CV-1RW27	**5**	**5**	**100**	**25.7**	**38**	**33.62**	**36.8**	**5.5697**	**0.1657**	**25.7**	**Apr-2019**	**-8**	**0.042**	**-6.267**	**95.8% (sig -)**	**Decreasing**	**---**
WI-CV-1RW34	8	8	100	301	660	457.625	407	138.5929	0.3029	332	Nov-2020	-16	0.031	-78.9454	96.9% (sig -)	Decreasing	---
WI-CV-1RW72	**4**	**4**	**100**	**1.1**	**2.16**	**1.58**	**1.53**	**0.4891**	**0.3095**	**2.16**	**Oct-2021**	**2**	**0.375**	**---**	**62.5% (+)**	**No Trend**	**Stable**
WI-CV-1RW90	9	9	100	161	236	189.7778	176	25.9653	0.1368	208	Oct-2021	-13	0.11	---	89% (-)	No Trend	Stable
WI-CV-2RW02	9	9	100	138	363	237.6667	231	75.4569	0.3175	363	Oct-2021	24	0.006	43.1089	99.4% (sig +)	Increasing	---
WI-CV-2RW04	10	10	100	3.59	16.3	9.426	9.37	4.3727	0.4639	8.68	Oct-2021	-21	0.036	-1.4437	96.4% (sig -)	Decreasing	---
WI-CV-2RW06	8	8	100	153	297	203.625	193.5	48.3615	0.2375	297	Oct-2021	-10	0.138	---	86.2% (-)	No Trend	Stable
WI-CV-3RW10	10	10	100	62	133	103.22	100.85	25.604	0.2481	133	Oct-2021	10	0.216	---	78.4% (+)	No Trend	Stable
WI-CV-3RW11	9	9	100	296	611	481.3333	515	111.6703	0.232	375	Apr-2021	-28	0.001	-62.4644	99.9% (sig -)	Decreasing	---

Notes:

Shading indicates detections and mean/median concentrations above the health advisory.

Bold indicates a well located on a parcel adjacent to a parcel with a well that has an historical PFOA detection above the health advisory.

A06 - Area 6

AF - Ault Field

CV - Coupeville

Table 10. Results of Mann-Kendall Analysis - PFOS + PFOA

Results of Investigation of Per- and Polyfluoroalkyl Substances in
Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
NAS Whidbey Island, Oak Harbor and Coupeville, Washington

Drinking Water Well	Samples Collected	PFOS and/or PFOA Detections	% Detected	Minimum PFOS + PFOA Detection	Maximum PFOS + PFOA Detection	Mean	Median	Standard Deviation (SD)	Coefficient of Variation (CV)	Most Recent PFOS + PFOA Detection	Most Recent Sample Month	Mann-Kendall Test Statistic (S)	Calculated Probability (p-value)	Slope	Result	Trend	Stability
WI-AF-1RW12	7	7	100	3.65	10.16	6.6643	5.79	2.5728	0.3861	3.65	Oct-2021	-5	0.281	---	71.9% (-)	No Trend	Stable
WI-AF-1RW28	**9**	**9**	**100**	**28.8**	**42.85**	**32.7256**	**30.3**	**4.8544**	**0.1483**	**42.85**	**Oct-2021**	**12**	**0.13**	**---**	**87% (+)**	**No Trend**	**Stable**
WI-AF-1RW32	9	9	100	543.99	47106	18083.1444	7741.7	20109.0866	1.112	4762.5	Oct-2021	18	0.038	7458.9155	96.2% (sig +)	Increasing	---
WI-AF-1RW40	9	9	100	7.15	73.1	25.32	16.87	21.5139	0.8497	8.88	Oct-2021	-32	0.001	-10.2789	99.9% (sig -)	Decreasing	---
WI-AF-3RW41	9	9	100	9.03	23.01	16.5589	15.28	4.9504	0.299	21.03	Oct-2021	26	0.003	2.9947	99.7% (sig +)	Increasing	---
WI-A06-RW03	**6**	**6**	**100**	**35.49**	**62.9**	**50.7983**	**52.9**	**9.0912**	**0.179**	**62.9**	**Oct-2021**	**8**	**0.102**	**---**	**89.8% (+)**	**No Trend**	**Stable**
WI-A06-RW04	**6**	**6**	**100**	**2.21**	**21.73**	**11.1233**	**10.68**	**6.7119**	**0.6034**	**21.73**	**Oct-2021**	**13**	**0.008**	**6.0013**	**99.2% (sig +)**	**Increasing**	**---**
WI-A06-RW05	7	7	100	112.4	150.7	124.7857	121.8	13.6386	0.1093	131.8	Oct-2021	-3	0.386	---	61.4% (-)	No Trend	Stable
WI-A06-RW08	5	5	100	98.5	126.9	109.38	107.2	10.7846	0.0986	98.5	Oct-2021	-4	0.242	---	75.8% (-)	No Trend	Stable
WI-A06-RW14	**6**	**6**	**100**	**29.48**	**43.6**	**37.6583**	**38.4**	**5.3577**	**0.1423**	**42.5**	**Oct-2021**	**13**	**0.008**	**4.2641**	**99.2% (sig +)**	**Increasing**	**---**
WI-A06-RW18	5	5	100	37.1	73.8	48.92	44.1	14.2906	0.2921	44.1	Nov-2020	-3	0.325	---	67.5% (-)	No Trend	Stable
WI-A06-RW19	7	7	100	119.4	147.6	133.7714	135.8	10.8417	0.081	137.8	Oct-2021	13	0.035	6.1853	96.5% (sig +)	Increasing	---
WI-A06-RW20	5	5	100	73.1	82.6	76.58	74.2	4.1415	0.0541	82.6	Apr-2021	4	0.242	---	75.8% (+)	No Trend	Stable
WI-A06-RW24	5	5	100	233.9	302.2	274.82	278	29.356	0.1068	301.9	Nov-2021	4	0.242	---	75.8% (+)	No Trend	Stable
WI-CV-1RW01	10	10	100	141.37	443	337.977	338.88	102.3846	0.3029	141.37	Oct-2021	-34	0.0005	-56.2212	100% (sig -)	Decreasing	---
WI-CV-1RW07	10	10	100	96.1	335.04	201.434	221.38	74.8135	0.3714	220.05	Oct-2021	3	0.431	---	56.9% (+)	No Trend	Stable
WI-CV-1RW23	10	10	100	50.34	70.9	62.203	62.9	6.2583	0.1006	50.34	Oct-2021	-9	0.242	---	75.8% (-)	No Trend	Stable
WI-CV-1RW27	**5**	**5**	**100**	**25.7**	**38**	**33.62**	**36.8**	**5.5697**	**0.1657**	**25.7**	**Apr-2019**	**-8**	**0.042**	**-6.1675**	**95.8% (sig -)**	**Decreasing**	**---**
WI-CV-1RW34	8	8	100	301	660	457.625	407	138.5929	0.3029	332	Nov-2020	-16	0.031	-79.8032	96.9% (sig -)	Decreasing	---
WI-CV-1RW72	**4**	**4**	**100**	**1.1**	**2.16**	**1.58**	**1.53**	**0.4891**	**0.3095**	**2.16**	**Oct-2021**	**2**	**0.375**	**---**	**62.5% (+)**	**No Trend**	**Stable**
WI-CV-1RW90	9	9	100	170.28	239.78	197.5089	185.01	24.9713	0.1264	223.5	Nov-2021	-10	0.179	---	82.1% (-)	No Trend	Stable
WI-CV-2RW02	9	9	100	138	363	237.6667	231	75.4569	0.3175	363	Oct-2021	24	0.006	43.1089	99.4% (sig +)	Increasing	---
WI-CV-2RW04	10	10	100	4.96	45.9	25.956	27.515	11.733	0.452	26.48	Oct-2021	-13	0.146	---	85.4% (-)	No Trend	Stable
WI-CV-2RW06	8	8	100	153	297.873	203.7341	193.5	48.6027	0.2386	297.873	Oct-2021	-10	0.138	---	86.2% (-)	No Trend	Stable
WI-CV-3RW10	10	10	100	62	136.41	104.516	102.985	26.3799	0.2524	136.41	Oct-2021	11	0.19	---	81% (+)	No Trend	Stable
WI-CV-3RW11	9	9	100	297.49	633	486.9811	515	117.2645	0.2408	376.85	Apr-2021	-30	0	-64.8064	100% (sig -)	Decreasing	---

Notes:

Shading indicates detections and mean/median concentrations above the health advisory.

Bold indicates a well located on a parcel adjacent to a parcel with a well that has an historical sum of PFOS and PFOA detection above the health advisory.

A06 - Area 6

AF - Ault Field

CV - Coupeville

Figures

Legend
- City
- Secondary Road
- Local Connecting Road
- Important Local Road
- Base Boundary

NAS - Naval Air Station
OLF - Outlying Landing Field

N

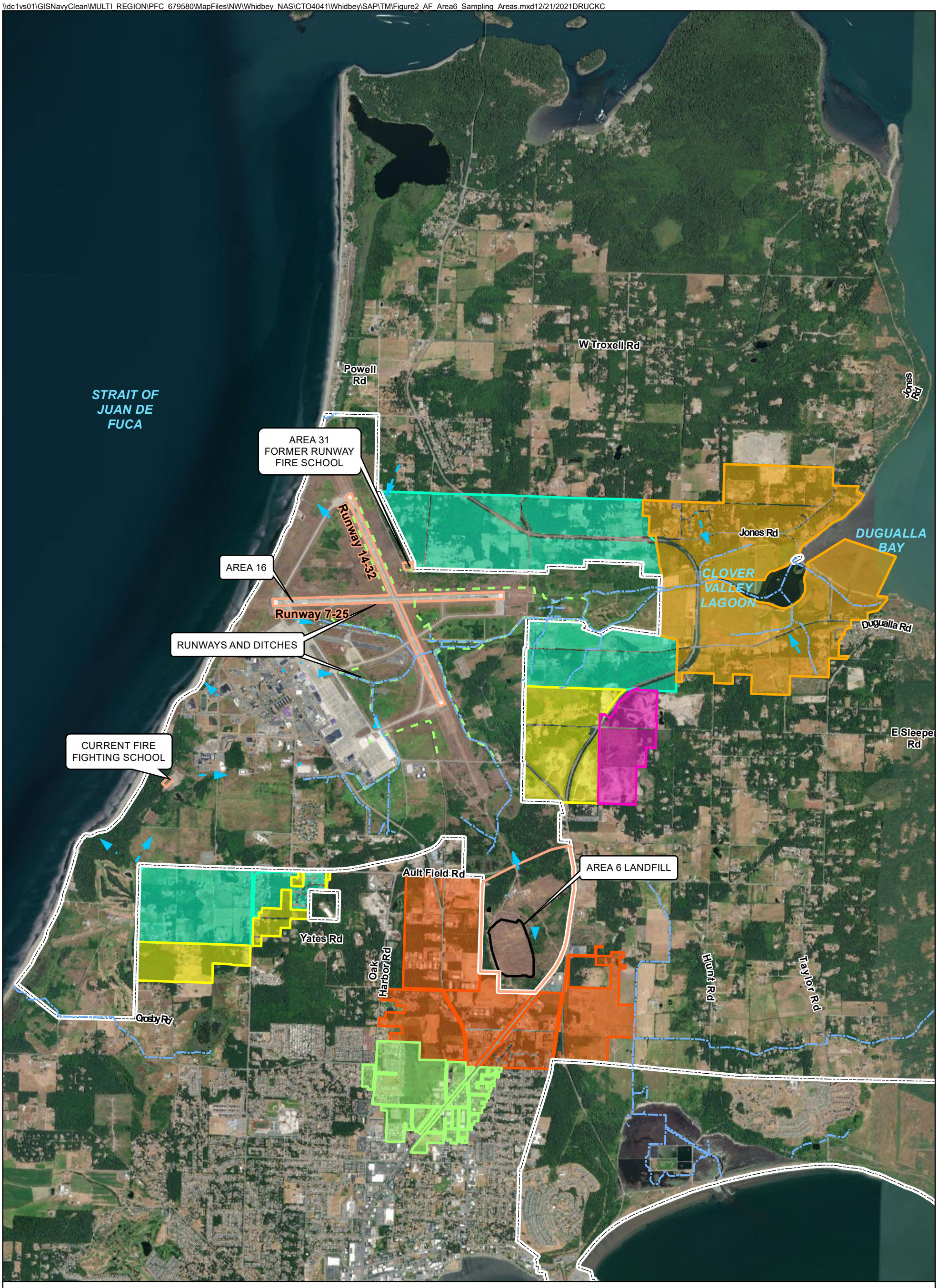
0 1 2 Miles

1 inch = 2 miles

Imagery Source: Esri

Figure 1
Installation Location Map
Drinking Water Technical Memorandum
NAS Whidbey Island
Oak Harbor and Coupeville, Washington

\\dc1vs01\GISNavyClean\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\Whidbey\SAP\TM\Figure2_AF_Area6_Sampling_Areas.mxd12/21/2021DRUCKC



Legend

- Site Boundary (suspected source)
- Drainage Ditch (Part of Area 16)
- Surface Water
- Estimated Groundwater Flow Direction
- Ault Field Phase 1 Sampling Area
- Ault Field Phase 2 Step-Out Sampling Area
- Ault Field Phase 3 Step-Out Sampling Area
- Ault Field Phase 4 Step-Out Sampling Area
- Area 6 Phase 1 Sampling Area
- Area 6 Phase 2 Step-Out Sampling Area
- Base Boundary

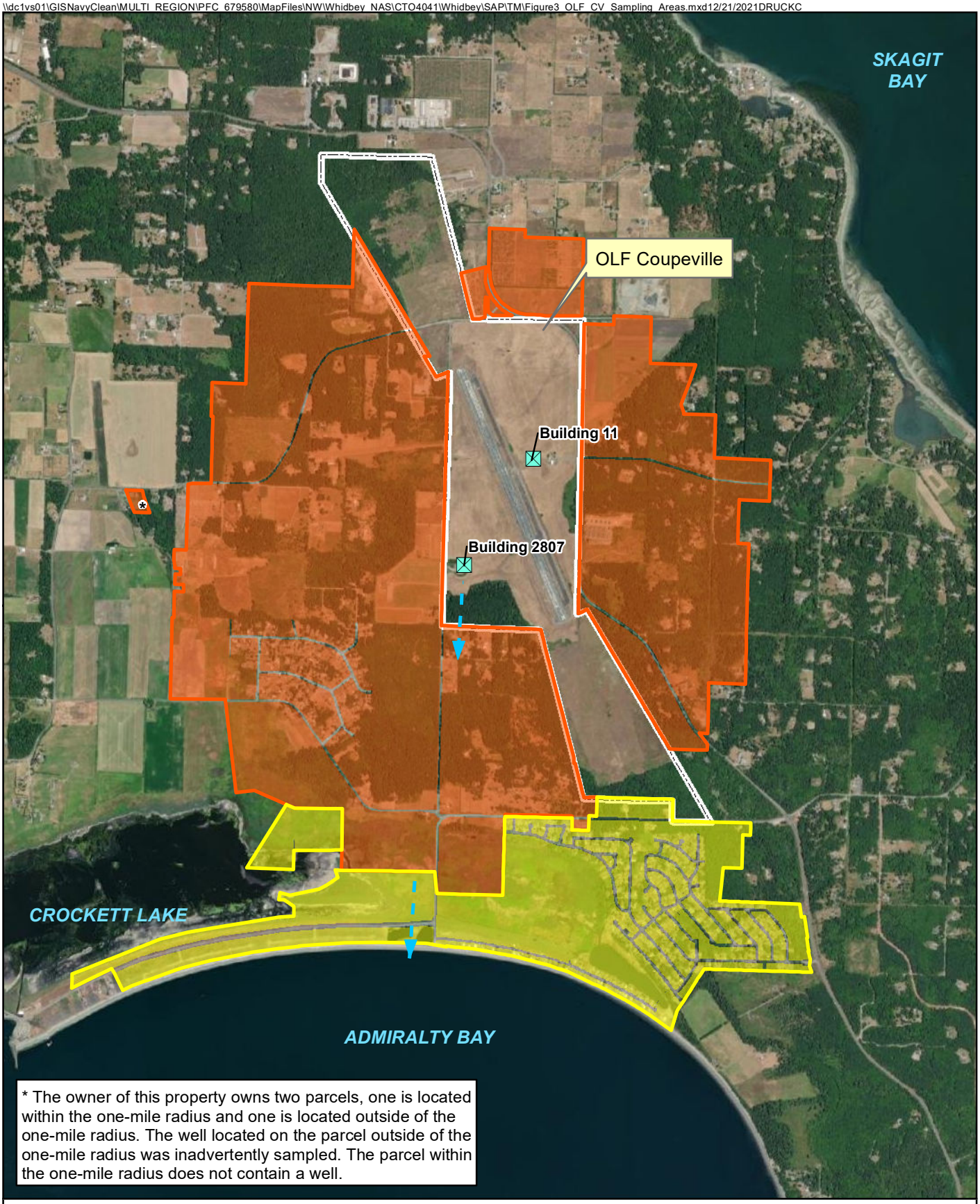
N

0 0.3 0.6 Miles

1 inch = 0.6 mile

Imagery Source: Esri

Figure 2
Ault Field and Area 6 Sampling Areas
Drinking Water Technical Memorandum
NAS Whidbey Island
Oak Harbor and Coupeville, Washington



* The owner of this property owns two parcels, one is located within the one-mile radius and one is located outside of the one-mile radius. The well located on the parcel outside of the one-mile radius was inadvertently sampled. The parcel within the one-mile radius does not contain a well.

Legend

- OLF Coupeville Supply Well
- Estimated Groundwater Flow Direction
- Phase 1 Sampling Area
- Phase 2 Step-Out Samping Area
- Base Boundary

N

0 0.25 0.5 Mile

1 inch = 0.5 mile

Imagery Source: Esri

Figure 3
OLF Coupeville Samplilng Areas
Drinking Water Technical Memorandum
NAS Whidbey Island
Oak Harbor and Coupeville, Washington

\\dc1vs01\GISNavyClean\MULTI_REGION\PFC_679580\MapFiles\NW\Whidbey_NAS\CTO4041\Whidbey\SAP\TM\Figure4_AF_Area6_PFAS_Results_Fall21.mxd2/24/2022DRUCKC

STRAIT OF JUAN DE FUCA

DUGUALLA BAY

CLOVER VALLEY LAGOON

Powell Rd

W Troxell Rd

Jones Rd

Dugualla Rd

E Sleepe Rd

Runway 14-32

Runway 7-25

Ault Field Rd

Yates Rd

Oak Harbor Rd

Hunt Rd

Taylor Rd

Crosby Rd

AREA 31
FORMER RUNWAY
FIRE SCHOOL

AREA 16

RUNWAYS AND DITCHES

CURRENT FIRE
FIGHTING SCHOOL

AREA 6 LANDFILL

2 samples collected
2 detections of PFOS/PFOA below the lifetime health advisory

1 sample collected
0 detections of PFOS/PFOA

1 sample collected
1 detection of PFOS/PFOA below the lifetime health advisory

0 samples collected*

3 samples collected
2 detections of PFOS/PFOA below the lifetime health advisory

5 samples collected
1 detection of PFOS/PFOA above the lifetime health advisory

6 samples collected
3 detections of PFOS/PFOA below the lifetime health advisory
3 detections of PFOS/PFOA above the lifetime health advisory

0 samples collected*

1 sample collected
1 detection of PFOS/PFOA above the lifetime health advisory

* There are no historical drinking water wells with PFAS detections or wells adjacent to exceedances within the Phase 3 Step-Out Sampling Area; therefore, no wells in these areas are included in the biannual sampling program.

Legend

- Site Boundary (suspected source)
- Drainage Ditch (Part of Area 16)
- Surface Water
- Estimated Groundwater Flow Direction
- Ault Field Phase 1 Sampling Area
- Ault Field Phase 2 Step-Out Sampling Area
- Ault Field Phase 3 Step-Out Sampling Area
- Ault Field Phase 4 Step-Out Sampling Area
- Area 6 Phase 1 Sampling Area
- Area 6 Phase 2 Step-Out Sampling Area
- Base Boundary

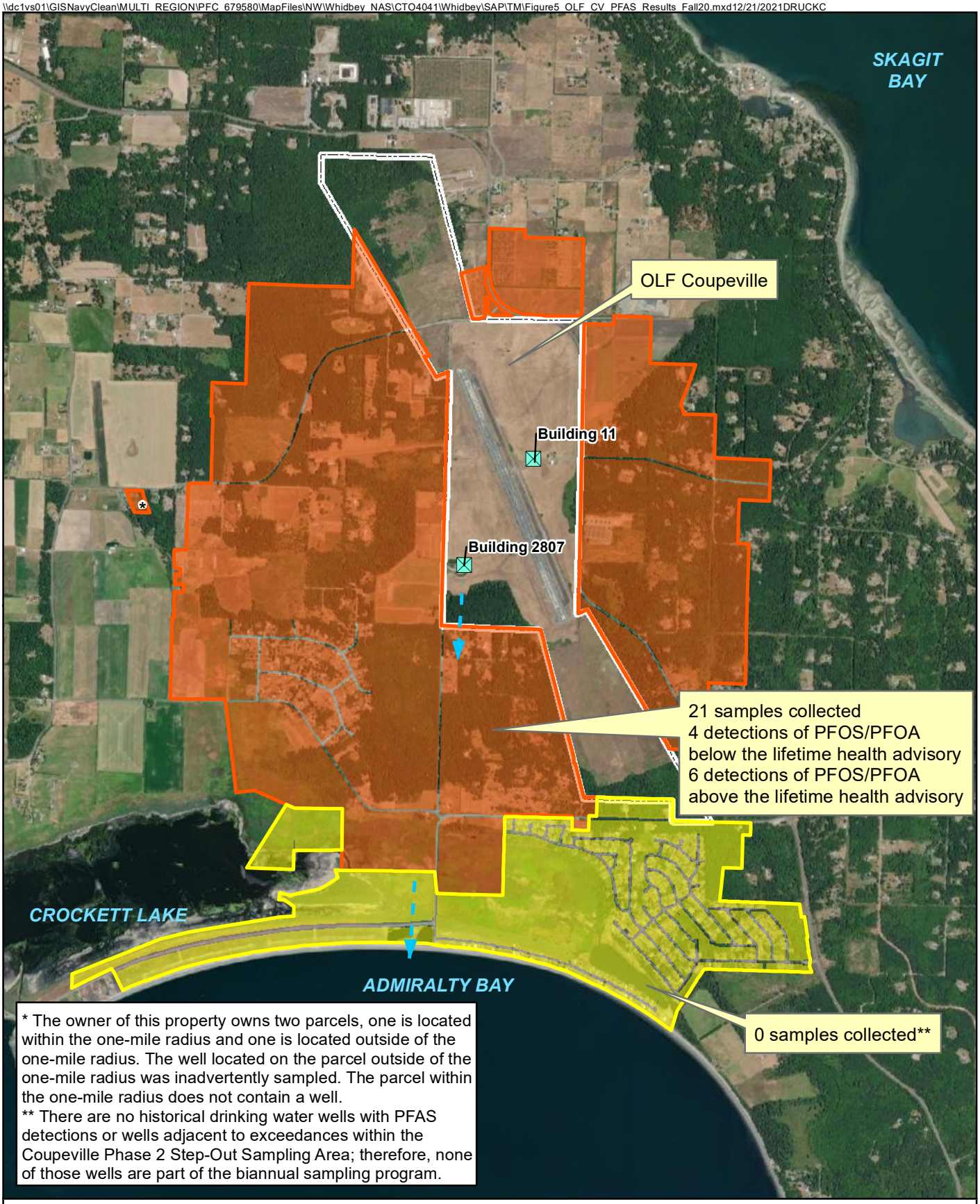
N

0 0.3 0.6 Miles

1 inch = 0.6 mile

Imagery Source: Esri

Figure 4
Ault Field and Area 6 Fall 2021 PFAS Results
Drinking Water Technical Memorandum
NAS Whidbey Island
Oak Harbor, Washington



* The owner of this property owns two parcels, one is located within the one-mile radius and one is located outside of the one-mile radius. The well located on the parcel outside of the one-mile radius was inadvertently sampled. The parcel within the one-mile radius does not contain a well.
** There are no historical drinking water wells with PFAS detections or wells adjacent to exceedances within the Coupeville Phase 2 Step-Out Sampling Area; therefore, none of those wells are part of the biannual sampling program.

Legend
- OLF Coupeville Supply Well
- Estimated Groundwater Flow Direction
- Phase 1 Sampling Area
- Phase 2 Step-Out Sampling Area
- Base Boundary

N

0 0.25 0.5 Mile

1 inch = 0.5 mile

Imagery Source: Esri

Figure 5
OLF Coupeville Fall 2021 PFAS Results
Drinking Water Technical Memorandum
NAS Whidbey Island
Coupeville, Washington

Attachment 1
Chains of Custody

CTO-4470

1/2

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: JILL SCHRUAU (name)

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

JILL SCHRUAU /JS — 10/7/21 — 1530
Relinquished by (printed name and signature) — Date — Time — Received by (printed name and signature) — Date — Time

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

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

ATTN: _____

Method of Shipment: _____
Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List-6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List-6	537.1 List of 14	537.1 List of 18	Comments
WI-A06-RW08-1021	10/4/21	1022		2	P	DW									X	
WI-A06-FB08-1021		1027														
WI-AF-1RW12-1021		1050														
WI-AF-1RW12P-1021		1052														
WI-AF-1FB12-1021		1057														
WI-AF-1RW01-1021		1156														
WI-AF-1FB01-1021		1201														
WI-AF-3RW18-1021		1418														
WI-AF-3FB18-1021		~~1432~~ 1423	TC													
WI-A06-RW05-1021		1452		2												

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:

Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-974-4856
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

CTO - 447U

2/2

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: JILL SCHRLAU (name)

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

JILL SCHRLAU — 10/7/21 — 1530
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

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

ATTN: _____

Method of Shipment: _____
Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Container(s) Type	Container(s) Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	PFAS by Isotope Dilution: UCMR3 PFAS List:6	PFAS by Isotope Dilution: 537.1 List: 14 or 18 (Circle One)	PFAS by Isotope Dilution: EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	EPA Method 537 (DW only): UCMR3 PFAS List:6	EPA Method 537 (DW only): 537.1 List of 14	EPA Method 537 (DW only): 537.1 List of 18	Comments
WI-A06-RW05-1021-MS	10/4/21	1452		2	P	DW									X	
WI-A06-RW05-1021-MSD		1452														
WI-A06-FB05-1021		1457														
WI-AF-1RW25-1021		1522														
WI-AF-1FB25-1021		1527														
WI-AF-3RW41-1021		1556														
WI-AF-3FB41-1021		1603														
WI-AF-3RW41P-1021		1558														

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:

Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-924-4856
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

ORIGIN ID:BLIA (801) 809-9702
THOMAS CHALMERS

1324 CRANBERRY COURT

BELLINGHAM, WA 98226
UNITED STATES US

SHIP DATE: 07OCT21
ACTWGT: 50.00 LB
CAD: 105505917/INET4400
DIMS: 24x18x18 IN

BILL SENDER

TO **MARTHA MAIER**
VISTA ANALYTICAL LABORATORY
1104 WINFIELD WAY

EL DORADO HILLS CA 95762
(916) 673-1520 REF: 186718208
INV:
PO: 9000NVT3.B.PN.ODC.03.FI-FS DEPT:

56DJ2J0778/FE4A

FedEx Express

J212021078981uv

FRI - 08 OCT 10:30A
PRIORITY OVERNIGHT

1 of 4

TRK# 0201 **7749 0651 1760**

MASTER

95762
CA-US SMF

WD MHRA

FedEx Ship Manager - Print Your Label(s)

10/7/21, 5:40 AM

CTO - 4472

1/2

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: JILL SCHRUAN (name)

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

JILL SCHRUAN — 10/7/21 — 1530
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

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

ATTN: _____

Method of Shipment: _____

Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	PFAS by Isotope Dilution PFOA/ PFOS	PFAS by Isotope Dilution UCMR3 PFAS List:6	PFAS by Isotope Dilution 537.1 List of 14	EPA Method 537 (DW only) 537.1 List of 18	Comments
WI-CV-1RW14-1021	10/5/21	0838		2	P	DW									X	
WI-CV-1FB14-1021		0843														
WI-CV-2RW04-1021		0903														
WI-CV-2FB04-1021		0908														
WI-CV-3RW10-1021		1001														
WI-CV-3FB10-1021		1006														
WI-CV-1RW07-1021		1016														
WI-CV-1FB07-1021		1023														
WI-CV-1RW07P-1021		1018														
WI-CV-3RW17-1021		1035														

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:

Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-924-4832
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

CTO - 4470

2/2

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: JILL SCHRUAN (name)

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
JILL SCHRUAN	10/7/21	1530			
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

ATTN: _____

Method of Shipment: _____

Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List of 14	537.1 List of 18	Comments
WI-CV-3FB17-1021	10/5/21	1040 ✓		2	P	DW									X	
WI-CV-2RW06-1021		1420 ✓														
WI-CV-2FB06-1021		1425 ✓														
WI-CV-1RW01-1021		~~1052~~ 1452 ✓														
WI-CV-1FB01-1021		1457 ✓														
WI-CV-1RW40-1021		1516 ✓														
WI-CV-1FB40-1021		1521 ✓														
WI-CV-1RW67-1021		1721														
WI-CV-1FB67-1021	↓	1726		↓	↓	↓									↓	

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:

Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-924-4856
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

ORIGIN ID:BLIA (801) 809-9702
THOMAS CHALMERS

1324 CRANBERRY COURT

BELLINGHAM, WA 98226
UNITED STATES US

SHIP DATE: 07OCT21
ACTWGT: 50.00 LB
CAD: 105505917/INET4400
DIMS: 24x18x18 IN

BILL SENDER

TO **MARTHA MAIER**
VISTA ANALYTICAL LABORATORY
1104 WINFIELD WAY

EL DORADO HILLS CA 95762
(916) 673-1520 REF: 186718208
INV:
PO: 9000NVT3.B.PN.ODC.03.FI-FS DEPT:

56DJ20778/FE4A

FedEx Express

J212021078901US

FedEx Ship Manager - Print Your Label(s)

FRI - 08 OCT 10:30A
PRIORITY OVERNIGHT

2 of 4
MPS# 0263 **7749 0651 1233**
Mstr# 7749 0651 1760
0201

95762
CA-US SMF

WD MHRA

10/7/21, 5:40 AM

GTO-4470

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: JILL SCHRLAU (name)

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

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
JILL SCHRLAU JS	10/7/21	15:30			

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

ATTN: _____

Method of Shipment: _____
Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	PFAS by Isotope Dilution: PFOA/ PFOS	PFAS by Isotope Dilution: UCMR3 PFAS List:6	PFAS by Isotope Dilution: 537.1 List of 14	PFAS by Isotope Dilution: 537.1 List of 18	EPA Method 537 (DW only)	Comments
WI-AF-1RW32-1021	10/6/21	0937 ✓		2	P	DW										X	Expect concentration 40,000 ppt ~~ng/L~~ JLS
WI-AF-1FB32-1021		0942 ✓															
WI-AF-1RW51-1021		0913 ✓															
WI-AF-1FB51-1021		0918 ✓															
WI-AF-1RW33-1021		1024 ✓															
WI-AF-1FB33-1021		1029 ✓															
WI-AOC-RW14-1021		1059 ✓															
WI-AOC-FB14-1021		1104 ✓															
WI-AOC-RW03-1021		1308 ✓															
WI-AOC-RW03P-1021		1310 ✓															

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:
Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-924-4856
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

CTO- 4477

2/2

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NYT3 PO#: _____ Sampler: JILL SCHRLAU (name)

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

JILL SCHRLAU — 10/7/21 — 1530
Relinquished by (printed name and signature) — Date — Time — Received by (printed name and signature) — Date — Time

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

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

ATTN: _____ Method of Shipment: _____ Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List of 14	537.1 List of 18	Comments
WI-AD06-FB03-1021	10/6/21	1315 ✓		2	P	DW									Y	
WI-AD06-RW04-1021		1342 ✓														
WI-AD06-FB04-1021		1347 ✓														
WI-AF-1RW28-1021		1144 ✓														
WI-AF-1RW28-1021-MS		1144 ✓														
WI-AF-1RW28-1021-MSD		DES 1149	1144 ✓													
WI-AF-1FB[X]28-1021		DES 1149 ✓														
WI-AF-1RW08-1021		1609 ✓														
WI-AF-1FB08-1021		1614 ✓														
WI-AF-1RW40-1021		1125 ✓														
WI-AF-1FB40-1021	↓	1130 ✓		↓	↓	↓										

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:
Name: Ginger Collins
Company: Jacobs
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-924-4856
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

ORIGIN ID:BLIA (801) 809-9702
THOMAS CHALMERS

1324 CRANBERRY COURT

BELLINGHAM, WA 98226
UNITED STATES US

SHIP DATE: 07OCT21
ACTWGT: 50.00 LB
CAD: 105505917/INET4400
DIMS: 24x18x18 IN

BILL SENDER

TO **MARTHA MAIER**
VISTA ANALYTICAL LABORATORY
1104 WINFIELD WAY

EL DORADO HILLS CA 95762
(916) 673-1520 REF: 186718208
INV:
PO: 9000NVT3.B.PN.ODC.03.FI-FS DEPT:

56D.D/0778/FE4A

FedEx Express

J212021070501uu

FRI - 08 OCT 10:30A
PRIORITY OVERNIGHT

3 of 4

MPS# 0263 **7749 0651 1520**

Mstr# 7749 0651 1760 0201

95762

WD MHRA

CA-US **SMF**

FedEx Ship Manager - Print Your Label(s)

10/7/21, 5:40 AM

CTO-447U

1/2

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: JILL SCHRLAU (name)

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

JILL SCHRLAU _____ 10/7/21 1530
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

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

ATTN: _____

Method of Shipment: _____
Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List of 14	537.1 List of 18	Comments
WI-CV-1RW27-1021	10/7/21	0830		2	P	DW						X			X	
WI-CV-1FB27-1021		0835														
WI-CV-1RW25-1021		0855														
WI-CV-1FB25-1021		0900														
WI-CV-1RW26-1021		0911														
WI-CV-1RW26P-1021		0913														
WI-CV-1FB26-1021		0916														
WI-CV-1RW23-1021		0948														
WI-CV-1FB23-1021		0953														
WI-CV-3RW07-1021		1021														

NO

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:

Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97333
Phone: 541-974-4854
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

CTO-447U

2/2

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: JILL SCHRUPP (name)

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

JILL SCHRUPP — 10/7/21 — 1530
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

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

ATTN: _____

Method of Shipment: _____

Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List of 14	537.1 List of 18	Comments
WI-CV-3FB07-1021	10/7/21	1026		2	P	DW									X	
WI-CV-1RW22-1021	"	1109		"	"	"									"	
WI-CV-1FB22-1021	"	1114		"	"	"									"	
WI-CV-1RW37-1021	"	1152		"	"	"									"	
WI-CV-1FB37-1021	"	1157		"	"	"									"	
WI-PDG-RW19-1021	"	1311		"	"	"									"	
WI-PDG-FB19-1021	"	1316		"	"	"									"	
WI-CV-1RW24-1021	"	0927		"	"	"									"	
WI-CV-1FB24-1021	"	0932		"	"	"									"	

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:
Name: Ginger Collins
Company: Jacobs
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-974-4850
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

ORIGIN ID:BLIA (801) 809-9702
THOMAS CHALMERS

1324 CRANBERRY COURT

BELLINGHAM, WA 98226
UNITED STATES US

SHIP DATE: 07OCT21
ACTWGT: 50.00 LB
CAD: 105505917/INET4400
DIMS: 24x18x18 IN

BILL SENDER

TO **MARTHA MAIER**
VISTA ANALYTICAL LABORATORY
1104 WINFIELD WAY

EL DORADO HILLS CA 95762
(916) 673-1520 REF: 186718208
INV:
PO: 9000NVT3.B.PN.ODC.03.FI-FS DEPT:

56DJ20778/FE4A

FedEx Express

J212021070801uv

FRI - 08 OCT 10:30A
PRIORITY OVERNIGHT

4 of 4
MPS# 0263 **7749 0651 1634**
Mstr# 7749 0651 1760 0201

95762
CA-US SMF

WD MHRA

FedEx Ship Manager - Print Your Label(s)

10/7/21, 5:40 AM

CTO-4470

1/1

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: Tom Chalmers (name)

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

Tom Chalmers [signature] 10/11/21 1500
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

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

ATTN: _____

Method of Shipment: _____

Tracking No.: _____

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List-6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List-6	537.1 List of 14	537.1 List of 18	Comments
WI-CV-3RW04-1021	10/8/21	0820	CV-3RW04	2	PY	DW									X	
WI-CV-3RW04-1021-MS		0820		2											X	
WI-CV-3RW04-1021-MSD		0820		2											X	
WI-CV-3FB04-1021		0825	↓	2											X	
WI-CV-2RW02-1021		0911	CV-2RW02	2											X	
WI-CV-2FB02-1021		0916	↓	2											X	
WI-CV-1RW72-1021		1002	CV-1RW72	2											X	
WI-CV-1FB72-1021	↓	1007	↓	2	↓	↓									X	

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:

Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97333
Phone: 541-974-4856
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Vista Analytical Laboratory

CHAIN OF CUSTODY

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

Project ID: 9000NVT3 PO#: _____ Sampler: Tom Chalmers (name)

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

Tom Chalmers 11/8/21 1600
Relinquished by (printed name and signature) Date Time Received by (printed name and signature) Date Time

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

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

Method of Shipment: Fed Ex
Tracking No.: 7751 5054 5622

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List of 14	537.1 List of 18	Comments
WI-AF-1RW77-1121	11/5/21	1045	1RW77	2	PY	DW									X	Pres. w/ TZ
WI-AF-1FB77-1121	↓	1047	1RW77	↓	↓	↓									X	↓
WI-AØ6-RW24-1121		1150	RW24												X	
WI-AØ6-RW24P-1121		1152	↓												X	
WI-AØ6-FB24-1121	↓	1154	↓	↓	↓	↓									X	

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:
Name: Ginger Collins
Company: Jacobs Engineering
Address: 1100 NE Circle Blvd #300
City: Corvallis State: OR Zip: 97330
Phone: 541-974-4856
Email: ginger.collins@jacobs.com

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

Bottle Preservation Type:
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 _____

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.

Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Attachment 2
Raw Data Table

Whidbey Island CTO 4470
Residential Drinking Water
Sept - Nov 2021
Validated

Sample ID	WI-A06-RW03-1021	WI-A06-RW03P-1021	WI-A06-RW04-1021	WI-A06-RW05-1021	WI-A06-RW08-1021	WI-A06-RW14-1021	WI-A06-RW19-1021	WI-A06-RW24-1121
Sample Date	10/6/21	10/6/21	10/6/21	10/4/21	10/4/21	10/6/21	10/7/21	11/5/21
Chemical Name								
Per- and Polyfluorinated Alkyl Substances (NG/L)								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
Perfluorobutanesulfonic acid (PFBS)	42.7	45.3	36	22	18.4	59.1	60	23.6
Perfluorodecanoic Acid (PFDA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
Perfluorododecanoic Acid (PFDoA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
Perfluoroheptanoic acid (PFHpA)	22.7	21.6	6.99	13.7	6.76	18.3	29.1	8.55
Perfluorohexanesulfonic acid (PFHxS)	124	124	86.3	165	92.7	228	247	391
Perfluorohexanoic Acid (PFHxA)	61.3	59.5	12.3	37.4	12	73	58.5	48.8
Perfluorononanoic acid (PFNA)	0.786 J	0.777 J	1.49 U	1.15 J	2.31	1.54 U	2.57	1.55 U
Perfluorooctane Sulfonate (PFOS)	21.5	23.6	12.7	82.2	77.1	17	95.6	247
Perfluorooctanoic acid (PFOA)	41.4	39.7 J	9.03	49.6	21.4	25.5	42.2	54.9
Perfluorotetradecanoic Acid (PFTeDA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
Perfluorotridecanoic Acid (PFTrDA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U
Perfluoroundecanoic Acid (PFUnA)	1.47 U	1.49 U	1.49 U	1.47 U	1.44 U	1.54 U	1.47 U	1.55 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/L - Nanograms per liter
U - The material was analyzed for, but not detected

Whidbey Island CTO 4470
Residential Drinking Water
Sept - Nov 2021
Validated

Sample ID	WI-A06-RW24P-1121	WI-AF-1RW01-1021	WI-AF-1RW12-1021	WI-AF-1RW12P-1021	WI-AF-1RW25-1021	WI-AF-1RW28-1021	WI-AF-1RW32-1021	WI-AF-1RW33-1021
Sample Date	11/5/21	10/4/21	10/4/21	10/4/21	10/4/21	10/6/21	10/6/21	10/6/21
Chemical Name								
Per- and Polyfluorinated Alkyl Substances (NG/L)								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
Perfluorobutanesulfonic acid (PFBS)	25	1.46 U	2.66	2.6	1.47 U	3.65	276	74.7
Perfluorodecanoic Acid (PFDA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
Perfluorododecanoic Acid (PFDoA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
Perfluoroheptanoic acid (PFHpA)	8.86	1.46 U	0.881 J	0.846 J	1.47 U	4.41	21.4	3.22
Perfluorohexanesulfonic acid (PFHxS)	495	1.46 U	1.46 U	0.775 J	0.745 J	11.5	1,150	10.6
Perfluorohexanoic Acid (PFHxA)	55.5	1.46 U	1.38 J	1.34 J	1.47 U	7.26	204	82.7
Perfluorononanoic acid (PFNA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
Perfluorooctane Sulfonate (PFOS)	243	1.46 U	1.15 J	1.29 J	1.47 U	1.25 J	4,720	1.45 U
Perfluorooctanoic acid (PFOA)	59.8	1.46 U	2.5	2.36	1.47 U	41.6	42.5	1.45 U
Perfluorotetradecanoic Acid (PFTeDA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
Perfluorotridecanoic Acid (PFTrDA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U
Perfluoroundecanoic Acid (PFUnA)	1.54 U	1.46 U	1.46 U	1.51 U	1.47 U	1.47 U	1.55 U	1.45 U

Notes:
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NG/L - Nanograms per liter
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Whidbey Island CTO 4470
Residential Drinking Water
Sept - Nov 2021
Validated

Sample ID	WI-AF-1RW40-1021	WI-AF-1RW51-1021	WI-AF-1RW68-1021	WI-AF-1RW77-1121	WI-AF-3RW18-1021	WI-AF-3RW41-1021	WI-AF-3RW41P-1021	WI-CV-1RW01-1021
Sample Date	10/6/21	10/6/21	10/6/21	11/5/21	10/4/21	10/4/21	10/4/21	10/5/21
Chemical Name								
Per- and Polyfluorinated Alkyl Substances (NG/L)								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
Perfluorobutanesulfonic acid (PFBS)	2.09	1.44 U	1.48 U	3.48	1.48 U	51.2	47.4	17
Perfluorodecanoic Acid (PFDA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
Perfluorododecanoic Acid (PFDoA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
Perfluoroheptanoic acid (PFHpA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	2.94	2.94	12.6
Perfluorohexanesulfonic acid (PFHxS)	6.19	0.963 J	1.48 U	10	1.48 U	53.4	54.2	135
Perfluorohexanoic Acid (PFHxA)	1.64 J	1.44 U	1.48 U	1.52 U	1.48 U	13.9	13.8	39.3
Perfluorononanoic acid (PFNA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
Perfluorooctane Sulfonate (PFOS)	4.9	1.44 U	1.48 U	0.783 J	1.48 U	16.9	18.6	1.37 J
Perfluorooctanoic acid (PFOA)	3.98	1.44 U	1.48 U	3.61	1.48 U	4.13	4.27	140
Perfluorotetradecanoic Acid (PFTeDA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
Perfluorotridecanoic Acid (PFTrDA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U
Perfluoroundecanoic Acid (PFUnA)	1.43 U	1.44 U	1.48 U	1.52 U	1.48 U	1.46 U	1.48 U	1.46 U

Notes:
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NG/L - Nanograms per liter
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Whidbey Island CTO 4470
Residential Drinking Water
Sept - Nov 2021
Validated

Sample ID	WI-CV-1RW07-1021	WI-CV-1RW07P-1021	WI-CV-1RW14-1021	WI-CV-1RW22-1021	WI-CV-1RW23-1021	WI-CV-1RW24-1021	WI-CV-1RW25-1021	WI-CV-1RW26-1021
Sample Date	10/5/21	10/5/21	10/5/21	10/7/21	10/7/21	10/7/21	10/7/21	10/7/21
Chemical Name								
Per- and Polyfluorinated Alkyl Substances (NG/L)								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
Perfluorobutanesulfonic acid (PFBS)	30.3 J	21.9 J	1.47 U	1.53 U	15.3	1.46 U	1.52 U	1.49 U
Perfluorodecanoic Acid (PFDA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
Perfluorododecanoic Acid (PFDoA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
Perfluoroheptanoic acid (PFHpA)	15.3 J	11.2 J	1.47 U	1.53 U	7.27	1.46 U	1.52 U	1.49 U
Perfluorohexanesulfonic acid (PFHxS)	78 J	56.5 J	1.47 U	1.53 U	48.9	1.46 U	1.52 U	1.49 U
Perfluorohexanoic Acid (PFHxA)	69.8 J	50.5 J	1.47 U	1.53 U	29.4	1.46 U	1.52 U	1.49 U
Perfluorononanoic acid (PFNA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
Perfluorooctane Sulfonate (PFOS)	2.05 J	2.05	1.47 U	1.53 U	1.34 J	1.46 U	1.52 U	1.49 U
Perfluorooctanoic acid (PFOA)	218 J	160 J	1.47 U	1.53 U	49	1.46 U	1.52 U	1.49 U
Perfluorotetradecanoic Acid (PFTeDA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
Perfluorotridecanoic Acid (PFTrDA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U
Perfluoroundecanoic Acid (PFUnA)	1.51 U	1.47 U	1.47 U	1.53 U	1.46 U	1.46 U	1.52 U	1.49 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/L - Nanograms per liter
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Whidbey Island CTO 4470
Residential Drinking Water
Sept - Nov 2021
Validated

Sample ID	WI-CV-1RW26P-1021	WI-CV-1RW27-1021	WI-CV-1RW37-1021	WI-CV-1RW40-1021	WI-CV-1RW67-1021	WI-CV-1RW72-1021	WI-CV-1RW90-0921	WI-CV-2RW02-1021
Sample Date	10/7/21	10/7/21	10/7/21	10/5/21	10/5/21	10/8/21	9/16/21	10/8/21
Chemical Name								
Per- and Polyfluorinated Alkyl Substances (NG/L)								
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
Perfluorobutanesulfonic acid (PFBS)	1.49 U	3.14	1.46 U	1.44 U	1.47 U	1.79 J	61.1	32.3
Perfluorodecanoic Acid (PFDA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
Perfluorododecanoic Acid (PFDoA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
Perfluoroheptanoic acid (PFHpA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	22.4	19.1
Perfluorohexanesulfonic acid (PFHxS)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.05 J	227	83.5
Perfluorohexanoic Acid (PFHxA)	1.49 U	14.2	1.46 U	1.44 U	1.47 U	1.66 J	74.7	76.2
Perfluorononanoic acid (PFNA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
Perfluorooctane Sulfonate (PFOS)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	15.5	1.44 U
Perfluorooctanoic acid (PFOA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	0.879 J	208	363
Perfluorotetradecanoic Acid (PFTeDA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
Perfluorotridecanoic Acid (PFTrDA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U
Perfluoroundecanoic Acid (PFUnA)	1.49 U	1.44 U	1.46 U	1.44 U	1.47 U	1.42 U	1.54 U	1.44 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/L - Nanograms per liter
U - The material was analyzed for, but not detected

Whidbey Island CTO 4470
Residential Drinking Water
Sept - Nov 2021
Validated

Sample ID	WI-CV-2RW04-1021	WI-CV-2RW06-1021	WI-CV-3RW04-1021	WI-CV-3RW07-1021	WI-CV-3RW10-1021	WI-CV-3RW17-1021
Sample Date	10/5/21	10/5/21	10/8/21	10/7/21	10/5/21	10/5/21
Chemical Name						
Per- and Polyfluorinated Alkyl Substances (NG/L)						
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
Perfluorobutanesulfonic acid (PFBS)	13.1	48	1.43 U	1.46 U	195	1.52 U
Perfluorodecanoic Acid (PFDA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
Perfluorododecanoic Acid (PFDoA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
Perfluoroheptanoic acid (PFHpA)	2.3	22.8	1.43 U	1.46 U	23.7	1.52 U
Perfluorohexanesulfonic acid (PFHxS)	20.1	54.4	3.11	1.46 U	103	1.52 U
Perfluorohexanoic Acid (PFHxA)	5.38	147	1.43 U	1.46 U	227	1.52 U
Perfluorononanoic acid (PFNA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
Perfluorooctane Sulfonate (PFOS)	17.8	0.873 J	1.43 U	1.46 U	3.41 U	1.52 U
Perfluorooctanoic acid (PFOA)	8.68	297	2.16	1.46 U	133	1.52 U
Perfluorotetradecanoic Acid (PFTeDA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
Perfluorotridecanoic Acid (PFTrDA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U
Perfluoroundecanoic Acid (PFUnA)	1.49 U	1.5 U	1.43 U	1.46 U	1.45 U	1.52 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/L - Nanograms per liter
U - The material was analyzed for, but not detected

Attachment 3
Data Validation Summary Reports

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 2109156
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Residential Wells, CTO-4470, Washington
Date: November 15, 2021

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW90-0921	2109156-01	Water
1MS	WI-CV-1RW90-0921MS	2109156-01MS	Water
1MSD	WI-CV-1RW90-0921MSD	2109156-01MSD	Water
2	WI-CV-2FB90-091621	2109156-02	Water

A full data validation was performed on the analytical data for one water sample and one aqueous field blank sample collected on September 16, 2020 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	*Method References*
PFAS	USEPA Method 537.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Final Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water Ault Field, Area 6, and Outlying Landing Field Coupeville, Naval Air Station Whidbey Island, April 2020, the DoD Final General Data Validation Guidelines, November 2019, and the USEPA Data Review and Validation Guidelines as follows:

- The USEPA "Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537," November 2018;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation

- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Stage 2B/4) data validation was performed with this review including a recalculation of 100% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Alkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-2FB90-091621	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values except for the following.

MS/MSD Sample	Compound	MS %R/MSD %R/RPD	Qualifier
1	PFHxS	182%/5.76%/188	None - 4X Rule Applies
	PFOA	-93.5%/-90.6%/OK	

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 11/17/21

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW90-0921

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: Outdoor Spigot
Matrix: Drinking Water
Date Collected: 16-Sep-21 16:58

Laboratory Data

Lab Sample: 2109156-01
Date Received: 18-Sep-21 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	61.1	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFHxA	307-24-4	74.7	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFHpA	375-85-9	22.4	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFHxS	355-46-4	227	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFOA	335-67-1	208	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFNA	375-95-1	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFOS	1763-23-1	15.5	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFDA	335-76-2	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
MeFOSAA	2355-31-9	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
EtFOSAA	2991-50-6	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFUnA	2058-94-8	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFDoA	307-55-1	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFTrDA	72629-94-8	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
PFTeDA	376-06-7	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
HFPO-DA	13252-13-6	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
ADONA	919005-14-4	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
9Cl-PF3ONS	756426-58-1	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
11Cl-PF3OUdS	763051-92-9	ND	0.771	1.54	2.06		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
13C2-PFDA	SURR	110	70 - 130		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
d5-EtFOSAA	SURR	104	70 - 130		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1
13C3-HFPO-DA	SURR	104	70 - 130		B1I0139	22-Sep-21	0.243 L	24-Sep-21 17:49	1

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

Results reported to the DL.

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

MW 11/5/21

Vista
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Sample ID: WI-CV-2FB90-091621

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: Outdoor Spigot
Matrix: Drinking Water
Date Collected: 16-Sep-21 16:55

Laboratory Data

Lab Sample: 2109156-02
Date Received: 18-Sep-21 09:35
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFHxA	307-24-4	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFHpA	375-85-9	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFHxS	355-46-4	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFOA	335-67-1	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFNA	375-95-1	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFOS	1763-23-1	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFDA	335-76-2	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
MeFOSAA	2355-31-9	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
EtFOSAA	2991-50-6	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFUnA	2058-94-8	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFDoA	307-55-1	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFTrDA	72629-94-8	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
PFTeDA	376-06-7	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
HFPO-DA	13252-13-6	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
ADONA	919005-14-4	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
9Cl-PF3ONS	756426-58-1	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
11Cl-PF3OUdS	763051-92-9	ND	0.732	1.46	1.95		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	105	70 - 130		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
13C2-PFDA	SURR	82.8	70 - 130		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
d5-EtFOSAA	SURR	83.2	70 - 130		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1
13C3-HFPO-DA	SURR	107	70 - 130		B1I0139	22-Sep-21	0.256 L	23-Sep-21 21:17	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 2110074
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Residential Wells, CTO-4470, Washington
Date: November 15, 2021

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW08-1021	2110074-01	Water
2	WI-A06-FB08-1021	2110074-02	Water
3	WI-AF-1RW12-1021	2110074-03	Water
4	WI-AF-1RW12P-1021	2110074-04	Water
5	WI-AF-1FB12-1021	2110074-05	Water
6	WI-AF-1RW01-1021	2110074-06	Water
7	WI-AF-1FB01-1021	2110074-07	Water
8	WI-AF-3RW18-1021	2110074-08	Water
9	WI-AF-3FB18-1021	2110074-09	Water
10	WI-A06-RW05-1021	2110074-10	Water
10MS	WI-A06-RW05-1021MS	2110074 10MS	Water
10MSD	WI-A06-RW05-1021MSD	2110074-10MSD	Water
11	WI-A06-FB05-1021	2110074-11	Water
12	WI-AF-1RW25-1021	2110074-12	Water
13	WI-AF-1FB25-1021	2110074-13	Water
14	WI-AF-3RW41-1021	2110074-14	Water
15	WI-AF-3FB41-1021	2110074-15	Water
16	WI-AF-3RW41P-1021	2110074-16	Water

A full data validation was performed on the analytical data for nine water samples and seven aqueous field blank samples collected on October 4, 2020 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	*Method References*
PFAS	USEPA Method 537.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Final Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water Ault Field, Area 6, and Outlying Landing Field Coupeville, Naval Air Station Whidbey Island, April 2020, the DoD Final General Data

Validation Guidelines, November 2019, and the USEPA Data Review and Validation Guidelines as follows:

- The USEPA "Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537," November 2018;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Stage 2B/4) data validation was performed with this review including a recalculation of 100% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Alkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB08-1021	None - ND	-	-	-
WI-AF-1FB12-1021	None - ND	-	-	-
WI-AF-1FB01-1021	None - ND	-	-	-
WI-AF-3FB18-1021	None - ND	-	-	-
WI-A06-FB05-1021	None - ND	-	-	-
WI-AF-1FB25-1021	None - ND	-	-	-
WI-AF-3FB41-1021	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples are summarized below. The precision was acceptable.

Compound	WI-AF-1RW12-1021 ng/L	WI-AF-1RW12P-1021 ng/L	RPD	Qualifier
PFBS	2.66	2.60	2%	None
PFHxA	1.38	1.34	3%	
PFHpA	0.881	0.846	4%	
PFHxS	1.46U	0.775	NC	
PFOA	2.50	2.36	6%	
PFOS	1.15	1.29	11%	

Compound	WI-AF-3RW41-1021 ng/L	WI-AF-3RW41P-1021 ng/L	RPD	Qualifier
PFBS	51.2	47.4	8%	None
PFHxA	13.9	13.8	1%	
PFHpA	2.94	2.94	0%	
PFHxS	53.4	54.2	1%	
PFOA	4.13	4.27	3%	
PFOS	16.9	18.6	10%	

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 11/17/21

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-RW08-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 10:22

Laboratory Data

Lab Sample: 2110074-01
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	18.4	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFHxA	307-24-4	12.0	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFHpA	375-85-9	6.76	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFHxS	355-46-4	92.7	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFOA	335-67-1	21.4	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFNA	375-95-1	2.31	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFOS	1763-23-1	77.1	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFDA	335-76-2	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
MeFOSAA	2355-31-9	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
EtFOSAA	2991-50-6	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFUnA	2058-94-8	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFDoA	307-55-1	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFTrDA	72629-94-8	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
PFTeDA	376-06-7	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
HFPO-DA	13252-13-6	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
ADONA	919005-14-4	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
9Cl-PF3ONS	756426-58-1	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
11Cl-PF3OUdS	763051-92-9	ND	0.719	1.44	1.92		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	99.1	70 - 130		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
13C2-PFDA	SURR	92.7	70 - 130		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
d5-EtFOSAA	SURR	86.8	70 - 130		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1
13C3-HFPO-DA	SURR	102	70 - 130		B1J0065	12-Oct-21	0.261 L	14-Oct-21 19:29	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL

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

NW 11/15/21

Vista
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2

Sample ID: WI-A06-FB08-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 10:27

Laboratory Data

Lab Sample: 2110074-02
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFHxA	307-24-4	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFHpA	375-85-9	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFHxS	355-46-4	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFOA	335-67-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFNA	375-95-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFOS	1763-23-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFDA	335-76-2	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
MeFOSAA	2355-31-9	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
EtFOSAA	2991-50-6	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFUnA	2058-94-8	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFDoA	307-55-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFTrDA	72629-94-8	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
PFTeDA	376-06-7	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
HFPO-DA	13252-13-6	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
ADONA	919005-14-4	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
9Cl-PF3ONS	756426-58-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
11Cl-PF3OUdS	763051-92-9	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	100	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
13C2-PFDA	SURR	97.6	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
d5-EtFOSAA	SURR	95.6	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1
13C3-HFPO-DA	SURR	103	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 19:40	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL.
When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 11/15/21

Vista 3
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1RW12-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 10:50

Laboratory Data

Lab Sample: 2110074-03
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	2.66	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFHxA	307-24-4	1.38	0.732	1.46	1.95	J	B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFHpA	375-85-9	0.881	0.732	1.46	1.95	J	B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFHxS	355-46-4	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFOA	335-67-1	2.50	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFNA	375-95-1	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFOS	1763-23-1	1.15	0.732	1.46	1.95	J	B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFDA	335-76-2	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
MeFOSAA	2355-31-9	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
EtFOSAA	2991-50-6	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFUnA	2058-94-8	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFDoA	307-55-1	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFTrDA	72629-94-8	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
PFTeDA	376-06-7	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
HFPO-DA	13252-13-6	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
ADONA	919005-14-4	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
9Cl-PF3ONS	756426-58-1	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
11Cl-PF3OUdS	763051-92-9	ND	0.732	1.46	1.95		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	114	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
13C2-PFDA	SURR	108	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
d5-EtFOSAA	SURR	96.2	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1
13C3-HFPO-DA	SURR	110	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 19:51	1

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

Results reported to the DL.

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

MW 11/15/21

Vista 4
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1RW12P-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 10:52

Laboratory Data

Lab Sample: 2110074-04
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	2.60	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFHxA	307-24-4	1.34	0.754	1.51	2.01	J	B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFHpA	375-85-9	0.846	0.754	1.51	2.01	J	B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFHxS	355-46-4	0.775	0.754	1.51	2.01	J	B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFOA	335-67-1	2.36	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFNA	375-95-1	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFOS	1763-23-1	1.29	0.754	1.51	2.01	J	B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFDA	335-76-2	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
MeFOSAA	2355-31-9	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
EtFOSAA	2991-50-6	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFUnA	2058-94-8	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFDoA	307-55-1	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFTrDA	72629-94-8	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
PFTeDA	376-06-7	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
HFPO-DA	13252-13-6	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
ADONA	919005-14-4	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
9Cl-PF3ONS	756426-58-1	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
11Cl-PF3OUdS	763051-92-9	ND	0.754	1.51	2.01		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	103	70 - 130		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
13C2-PFDA	SURR	100	70 - 130		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
d5-EtFOSAA	SURR	92.1	70 - 130		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1
13C3-HFPO-DA	SURR	103	70 - 130		B1J0065	12-Oct-21	0.249 L	14-Oct-21 20:02	1

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

Results reported to the DL

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

NW 11/15/21

Vista 5
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1FB12-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 10:57

Laboratory Data

Lab Sample: 2110074-05
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFHxA	307-24-4	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFHpA	375-85-9	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFHxS	355-46-4	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFOA	335-67-1	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFNA	375-95-1	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFOS	1763-23-1	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFDA	335-76-2	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
MeFOSAA	2355-31-9	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
EtFOSAA	2991-50-6	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFUnA	2058-94-8	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFDoA	307-55-1	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFTrDA	72629-94-8	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
PFTeDA	376-06-7	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
HFPO-DA	13252-13-6	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
ADONA	919005-14-4	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
9Cl-PF3ONS	756426-58-1	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
11Cl-PF3OUdS	763051-92-9	ND	0.767	1.54	2.05		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95.0	70 - 130		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
13C2-PFDA	SURR	90.8	70 - 130		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
d5-EtFOSAA	SURR	91.3	70 - 130		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1
13C3-HFPO-DA	SURR	95.1	70 - 130		B1J0065	12-Oct-21	0.244 L	14-Oct-21 20:13	1

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

Results reported to the DL.

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

11/15/21

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Sample ID: WI-AF-1RW01-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 11:56

Laboratory Data

Lab Sample: 2110074-06
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFHxA	307-24-4	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFHpA	375-85-9	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFHxS	355-46-4	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFOA	335-67-1	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFNA	375-95-1	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFOS	1763-23-1	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFDA	335-76-2	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
MeFOSAA	2355-31-9	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
EtFOSAA	2991-50-6	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFUnA	2058-94-8	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFDoA	307-55-1	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFTrDA	72629-94-8	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
PFTeDA	376-06-7	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
HFPO-DA	13252-13-6	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
ADONA	919005-14-4	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
9Cl-PF3ONS	756426-58-1	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
11Cl-PF3OUdS	763051-92-9	ND	0.734	1.46	1.96		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	103	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
13C2-PFDA	SURR	97.9	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
d5-EtFOSAA	SURR	99.5	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1
13C3-HFPO-DA	SURR	103	70 - 130		B1J0065	12-Oct-21	0.256 L	14-Oct-21 20:24	1

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

Results reported to the DL.

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

Vista an Enthalpy Analytical Laboratory

7

Sample ID: WI-AF-1FB01-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 04-Oct-21 12:01

Laboratory Data

Lab Sample: 2110074-07
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFHxA	307-24-4	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFHpA	375-85-9	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFHxS	355-46-4	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFOA	335-67-1	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFNA	375-95-1	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFOS	1763-23-1	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFDA	335-76-2	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
MeFOSAA	2355-31-9	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
EtFOSAA	2991-50-6	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFUnA	2058-94-8	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFDoA	307-55-1	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFTrDA	72629-94-8	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
PFTeDA	376-06-7	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
HFPO-DA	13252-13-6	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
ADONA	919005-14-4	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
9Cl-PF3ONS	756426-58-1	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
11Cl-PF3OUdS	763051-92-9	ND	0.764	1.53	2.04		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	105	70 - 130		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
13C2-PFDA	SURR	102	70 - 130		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
d5-EtFOSAA	SURR	88.3	70 - 130		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1
13C3-HFPO-DA	SURR	106	70 - 130		B1J0065	12-Oct-21	0.245 L	14-Oct-21 20:35	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista
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8

Sample ID: WI-AF-3RW18-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 14:18

Laboratory Data

Lab Sample: 2110074-08
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFHxA	307-24-4	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFHpA	375-85-9	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFHxS	355-46-4	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFOA	335-67-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFNA	375-95-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFOS	1763-23-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFDA	335-76-2	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
MeFOSAA	2355-31-9	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
EtFOSAA	2991-50-6	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFUnA	2058-94-8	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFDoA	307-55-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFTrDA	72629-94-8	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
PFTeDA	376-06-7	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
HFPO-DA	13252-13-6	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
ADONA	919005-14-4	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
9Cl-PF3ONS	756426-58-1	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
11Cl-PF3OUdS	763051-92-9	ND	0.738	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.7	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
13C2-PFDA	SURR	88.7	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
d5-EtFOSAA	SURR	82.6	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1
13C3-HFPO-DA	SURR	101	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 20:46	1

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

Results reported to the DL.

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

MW 11/15/21

Sample ID: WI-AF-3FB18-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 14:23

Laboratory Data

Lab Sample: 2110074-09
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFHxA	307-24-4	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFHpA	375-85-9	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFHxS	355-46-4	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFOA	335-67-1	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFNA	375-95-1	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFOS	1763-23-1	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFDA	335-76-2	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
MeFOSAA	2355-31-9	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
EtFOSAA	2991-50-6	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFUnA	2058-94-8	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFDoA	307-55-1	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFTrDA	72629-94-8	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
PFTeDA	376-06-7	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
HFPO-DA	13252-13-6	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
ADONA	919005-14-4	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
9Cl-PF3ONS	756426-58-1	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
11Cl-PF3OUdS	763051-92-9	ND	0.773	1.54	2.06		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104	70 - 130		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
13C2-PFDA	SURR	103	70 - 130		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
d5-EtFOSAA	SURR	94.3	70 - 130		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1
13C3-HFPO-DA	SURR	104	70 - 130		B1J0065	12-Oct-21	0.243 L	14-Oct-21 20:57	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL.

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

Rev 11/15/21

Vista 10
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-RW05-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 14:52

Laboratory Data

Lab Sample: 2110074-10
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	22.0	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFHxA	307-24-4	37.4	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFHpA	375-85-9	13.7	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFHxS	355-46-4	165	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFOA	335-67-1	49.6	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFNA	375-95-1	1.15	0.734	1.47	1.96	J	B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFOS	1763-23-1	82.2	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFDA	335-76-2	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
MeFOSAA	2355-31-9	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
EtFOSAA	2991-50-6	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFUnA	2058-94-8	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFDoA	307-55-1	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFTrDA	72629-94-8	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
PFTeDA	376-06-7	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
HFPO-DA	13252-13-6	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
ADONA	919005-14-4	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
9Cl-PF3ONS	756426-58-1	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
11Cl-PF3OUdS	763051-92-9	ND	0.734	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
13C2-PFDA	SURR	102	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
d5-EtFOSAA	SURR	91.6	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1
13C3-HFPO-DA	SURR	109	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:08	1

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

Results reported to the DL.

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

11/15/21

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-FB05-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 04-Oct-21 14:57

Laboratory Data

Lab Sample: 2110074-11
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFHxA	307-24-4	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFHpA	375-85-9	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFHxS	355-46-4	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFOA	335-67-1	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFNA	375-95-1	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFOS	1763-23-1	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFDA	335-76-2	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
MeFOSAA	2355-31-9	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
EtFOSAA	2991-50-6	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFUnA	2058-94-8	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFDoA	307-55-1	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFTrDA	72629-94-8	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
PFTeDA	376-06-7	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
HFPO-DA	13252-13-6	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
ADONA	919005-14-4	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
9Cl-PF3ONS	756426-58-1	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
11Cl-PF3OUdS	763051-92-9	ND	0.743	1.49	1.98		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.8	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
13C2-PFDA	SURR	91.2	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
d5-EtFOSAA	SURR	85.1	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1
13C3-HFPO-DA	SURR	101	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 21:19	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista an Enthalpy Analytical Laboratory 12

Sample ID: WI-AF-1RW25-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 15:22

Laboratory Data

Lab Sample: 2110074-12
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFHxA	307-24-4	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFHpA	375-85-9	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFHxS	355-46-4	0.745	0.735	1.47	1.96	J	B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFOA	335-67-1	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFNA	375-95-1	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFOS	1763-23-1	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFDA	335-76-2	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
MeFOSAA	2355-31-9	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
EtFOSAA	2991-50-6	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFUnA	2058-94-8	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFDoA	307-55-1	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFTrDA	72629-94-8	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
PFTeDA	376-06-7	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
HFPO-DA	13252-13-6	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
ADONA	919005-14-4	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
9Cl-PF3ONS	756426-58-1	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
11Cl-PF3OUdS	763051-92-9	ND	0.735	1.47	1.96		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	99.0	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
13C2-PFDA	SURR	86.3	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
d5-EtFOSAA	SURR	70.6	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1
13C3-HFPO-DA	SURR	99.2	70 - 130		B1J0065	12-Oct-21	0.255 L	14-Oct-21 21:30	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

Nov 11/15/21

Vista 13
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1FB25-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 15:27

Laboratory Data

Lab Sample: 2110074-13
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFHxA	307-24-4	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFHpA	375-85-9	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFHxS	355-46-4	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFOA	335-67-1	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFNA	375-95-1	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFOS	1763-23-1	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFDA	335-76-2	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
MeFOSAA	2355-31-9	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
EtFOSAA	2991-50-6	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFUnA	2058-94-8	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFDoA	307-55-1	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFTrDA	72629-94-8	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
PFTeDA	376-06-7	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
HFPO-DA	13252-13-6	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
ADONA	919005-14-4	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
9Cl-PF3ONS	756426-58-1	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
11Cl-PF3OUdS	763051-92-9	ND	0.763	1.52	2.03		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.1	70 - 130		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
13C2-PFDA	SURR	91.0	70 - 130		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
d5-EtFOSAA	SURR	91.2	70 - 130		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1
13C3-HFPO-DA	SURR	96.7	70 - 130		B1J0065	12-Oct-21	0.246 L	14-Oct-21 21:41	1

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

Results reported to the DL.

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

MW 11/15/21

Vista 14
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-3RW41-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 15:56

Laboratory Data

Lab Sample: 2110074-14
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	51.2	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFHxA	307-24-4	13.9	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFHpA	375-85-9	2.94	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFHxS	355-46-4	53.4	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFOA	335-67-1	4.13	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFNA	375-95-1	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFOS	1763-23-1	16.9	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFDA	335-76-2	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
MeFOSAA	2355-31-9	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
EtFOSAA	2991-50-6	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFUnA	2058-94-8	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFDoA	307-55-1	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFTrDA	72629-94-8	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
PFTeDA	376-06-7	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
HFPO-DA	13252-13-6	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
ADONA	919005-14-4	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
9Cl-PF3ONS	756426-58-1	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
11Cl-PF3OUdS	763051-92-9	ND	0.728	1.46	1.94		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
13C2-PFDA	SURR	101	70 - 130		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
d5-EtFOSAA	SURR	86.5	70 - 130		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1
13C3-HFPO-DA	SURR	108	70 - 130		B1J0065	12-Oct-21	0.257 L	14-Oct-21 21:52	1

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

Results reported to the DL

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

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Vista 15
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-3FB41-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 16:03

Laboratory Data

Lab Sample: 2110074-15
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFHxA	307-24-4	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFHpA	375-85-9	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFHxS	355-46-4	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFOA	335-67-1	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFNA	375-95-1	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFOS	1763-23-1	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFDA	335-76-2	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
MeFOSAA	2355-31-9	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
EtFOSAA	2991-50-6	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFUnA	2058-94-8	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFDoA	307-55-1	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFTrDA	72629-94-8	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
PFTeDA	376-06-7	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
HFPO-DA	13252-13-6	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
ADONA	919005-14-4	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
9Cl-PF3ONS	756426-58-1	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
11Cl-PF3OUdS	763051-92-9	ND	0.745	1.49	1.99		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
13C2-PFDA	SURR	97.7	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
d5-EtFOSAA	SURR	88.8	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1
13C3-HFPO-DA	SURR	102	70 - 130		B1J0065	12-Oct-21	0.252 L	14-Oct-21 22:04	1

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

Results reported to the DL.

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

MW 11/15/21

Vista 16
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-3RW41P-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 04-Oct-21 15:58

Laboratory Data

Lab Sample: 2110074-16
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	47.4	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFHxA	307-24-4	13.8	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFHpA	375-85-9	2.94	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFHxS	355-46-4	54.2	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFOA	335-67-1	4.27	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFNA	375-95-1	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFOS	1763-23-1	18.6	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFDA	335-76-2	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
MeFOSAA	2355-31-9	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
EtFOSAA	2991-50-6	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFUnA	2058-94-8	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFDoA	307-55-1	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFTrDA	72629-94-8	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
PFTeDA	376-06-7	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
HFPO-DA	13252-13-6	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
ADONA	919005-14-4	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
9Cl-PF3ONS	756426-58-1	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
11Cl-PF3OUdS	763051-92-9	ND	0.737	1.48	1.97		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	107	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
13C2-PFDA	SURR	94.1	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
d5-EtFOSAA	SURR	79.5	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1
13C3-HFPO-DA	SURR	106	70 - 130		B1J0065	12-Oct-21	0.254 L	14-Oct-21 22:15	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 2110075
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Residential Wells, CTO-4470, Washington
Date: November 15, 2021

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW14-1021	2110075-01	Water
2	WI-CV-1FB14-1021	2110075-02	Water
3	WI-CV-2RW04-1021	2110075-03	Water
4	WI-CV-2FB04-1021	2110075-04	Water
5	WI-CV-3RW10-1021	2110075-05	Water
6	WI-CV-3FB10-1021	2110075-06	Water
7	WI-CV-1RW07-1021	2110075-07	Water
8	WI-CV-1FB07-1021	2110075-08	Water
9	WI-CV-1RW07P-1021	2110075-09	Water
10	WI-CV-3RW17-1021	2110075-10	Water
11	WI-CV-3FB17-1021	2110075-11	Water
12	WI-CV-2RW06-1021	2110075-12	Water
13	WI-CV-2FB06-1021	2110075-13	Water
14	WI-CV-1RW01-1021	2110075-14	Water
15	WI-CV-1FB01-1021	2110075-15	Water
16	WI-CV-1RW40-1021	2110075-16	Water
17	WI-CV-1FB40-1021	2110075-17	Water
18	WI-CV-1RW67-1021	2110075-18	Water
19	WI-CV-1FB67-1021	2110075-19	Water

A full data validation was performed on the analytical data for ten water samples and nine aqueous field blank samples collected on October 5, 2020 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	*Method References*
PFAS	USEPA Method 537.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Final Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water Ault Field, Area 6, and Outlying Landing

Field Coupeville, Naval Air Station Whidbey Island, April 2020, the DoD Final General Data Validation Guidelines, November 2019, and the USEPA Data Review and Validation Guidelines as follows:

- The USEPA "Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537," November 2018;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Stage 2B/4) data validation was performed with this review including a recalculation of 100% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Alkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-1FB14-1021	None - ND	-	-	-
WI-CV-2FB04-1021	None - ND	-	-	-
WI-CV-3FB10-1021	PFOS	0.870	U	5
WI-CV-1FB07-1021	None - ND	-	-	-
WI-CV-3FB17-1021	None - ND	-	-	-
WI-CV-2FB06-1021	None - ND	-	-	-
WI-CV-1FB01-1021	None - ND	-	-	-
WI-CV-1FB40-1021	None - ND	-	-	-
WI-CV-1FB67-1021	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	Area Count	Qualifier
7	13C4-PFOS	Low	J - PFOS
17	13C2-PFOA	Low	UJ - PFOA
	d3-N-MeFOSAA	Low	UJ - N-MeFOSAA

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples are summarized below. The precision was unacceptable for several compounds. These results were qualified as estimated (J).

Compound	WI-CV-1RW07-1021 ng/L	WI-CV-1RW07P-1021 ng/L	RPD	Qualifier
PFBS	30.3	21.9	32%	J
PFHxA	69.8	50.5	32%	
PFHpA	15.3	11.2	31%	
PFHxS	78.0	56.5	32%	
PFOA	218	160	31%	
PFOS	2.05	2.05	0%	None

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 11/17/21

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW14-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 08:38

Laboratory Data

Lab Sample: 2110075-01
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFHxA	307-24-4	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFHpA	375-85-9	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFHxS	355-46-4	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFOA	335-67-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFNA	375-95-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFOS	1763-23-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFDA	335-76-2	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
MeFOSAA	2355-31-9	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
EtFOSAA	2991-50-6	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFUnA	2058-94-8	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFDoA	307-55-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFTrDA	72629-94-8	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
PFTeDA	376-06-7	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
HFPO-DA	13252-13-6	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
ADONA	919005-14-4	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
9Cl-PF3ONS	756426-58-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
11Cl-PF3OUdS	763051-92-9	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
13C2-PFDA	SURR	99.2	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
d5-EtFOSAA	SURR	87.0	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1
13C3-HFPO-DA	SURR	110	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:32	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL

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

NW 11/15/21

Vista
an Enthalpy Analytical Laboratory

2

Sample ID: WI-CV-1FB14-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 05-Oct-21 08:43

Laboratory Data

Lab Sample: 2110075-02
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFHxA	307-24-4	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFHpA	375-85-9	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFHxS	355-46-4	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFOA	335-67-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFNA	375-95-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFOS	1763-23-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFDA	335-76-2	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
MeFOSAA	2355-31-9	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
EtFOSAA	2991-50-6	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFUnA	2058-94-8	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFDoA	307-55-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFTrDA	72629-94-8	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
PFTeDA	376-06-7	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
HFPO-DA	13252-13-6	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
ADONA	919005-14-4	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
9Cl-PF3ONS	756426-58-1	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
11Cl-PF3OUdS	763051-92-9	ND	0.736	1.47	1.96		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	77.8	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
13C2-PFDA	SURR	77.0	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
d5-EtFOSAA	SURR	73.3	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1
13C3-HFPO-DA	SURR	81.1	70 - 130		B1J0066	12-Oct-21	0.255 L	14-Oct-21 23:43	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 3
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-2RW04-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 09:03

Laboratory Data

Lab Sample: 2110075-03
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	13.1	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFHxA	307-24-4	5.38	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFHpA	375-85-9	2.30	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFHxS	355-46-4	20.1	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFOA	335-67-1	8.68	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFNA	375-95-1	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFOS	1763-23-1	17.8	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFDA	335-76-2	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
MeFOSAA	2355-31-9	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
EtFOSAA	2991-50-6	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFUnA	2058-94-8	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFDoA	307-55-1	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFTrDA	72629-94-8	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
PFTeDA	376-06-7	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
HFPO-DA	13252-13-6	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
ADONA	919005-14-4	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
9Cl-PF3ONS	756426-58-1	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
11Cl-PF3OUdS	763051-92-9	ND	0.746	1.49	1.99		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	101	70 - 130		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
13C2-PFDA	SURR	90.1	70 - 130		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
d5-EtFOSAA	SURR	76.0	70 - 130		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1
13C3-HFPO-DA	SURR	104	70 - 130		B1J0066	12-Oct-21	0.251 L	14-Oct-21 23:54	1

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

Results reported to the DL.

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

MW 11/15/21

Vista 4
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-2FB04-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 09:08

Laboratory Data

Lab Sample: 2110075-04
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFHxA	307-24-4	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFHpA	375-85-9	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFHxS	355-46-4	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFOA	335-67-1	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFNA	375-95-1	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFOS	1763-23-1	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFDA	335-76-2	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
MeFOSAA	2355-31-9	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
EtFOSAA	2991-50-6	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFUnA	2058-94-8	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFDoA	307-55-1	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFTrDA	72629-94-8	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
PFTeDA	376-06-7	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
HFPO-DA	13252-13-6	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
ADONA	919005-14-4	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
9Cl-PF3ONS	756426-58-1	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
11Cl-PF3OUdS	763051-92-9	ND	0.784	1.57	2.09		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	107	70 - 130		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
13C2-PFDA	SURR	96.1	70 - 130		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
d5-EtFOSAA	SURR	89.0	70 - 130		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1
13C3-HFPO-DA	SURR	109	70 - 130		B1J0066	12-Oct-21	0.239 L	15-Oct-21 00:05	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 5
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-3RW10-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 10:01

Laboratory Data

Lab Sample: 2110075-05
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	195	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFHxA	307-24-4	227	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFHpA	375-85-9	23.7	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFHxS	355-46-4	103	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFOA	335-67-1	133	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFNA	375-95-1	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFOS	1763-23-1	3.41 U	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1 FBL
PFDA	335-76-2	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
MeFOSAA	2355-31-9	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
EtFOSAA	2991-50-6	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFUnA	2058-94-8	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFDoA	307-55-1	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFTrDA	72629-94-8	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
PFTeDA	376-06-7	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
HFPO-DA	13252-13-6	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
ADONA	919005-14-4	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
9Cl-PF3ONS	756426-58-1	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
11Cl-PF3OUdS	763051-92-9	ND	0.728	1.45	1.94		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	109	70 - 130		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
13C2-PFDA	SURR	99.9	70 - 130		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
d5-EtFOSAA	SURR	91.5	70 - 130		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1
13C3-HFPO-DA	SURR	110	70 - 130		B1J0066	12-Oct-21	0.258 L	15-Oct-21 00:16	1

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

Results reported to the DL.

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

MW 11/15/21

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-3FB10-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 05-Oct-21 10:06

Laboratory Data

Lab Sample: 2110075-06
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFHxA	307-24-4	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFHpA	375-85-9	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFHxS	355-46-4	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFOA	335-67-1	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFNA	375-95-1	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFOS	1763-23-1	0.870	0.772	1.54	2.06	J	B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFDA	335-76-2	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
MeFOSAA	2355-31-9	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
EtFOSAA	2991-50-6	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFUnA	2058-94-8	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFDoA	307-55-1	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFTrDA	72629-94-8	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
PFTeDA	376-06-7	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
HFPO-DA	13252-13-6	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
ADONA	919005-14-4	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
9Cl-PF3ONS	756426-58-1	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
11Cl-PF3OUdS	763051-92-9	ND	0.772	1.54	2.06		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95.7	70 - 130		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
13C2-PFDA	SURR	86.2	70 - 130		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
d5-EtFOSAA	SURR	81.7	70 - 130		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1
13C3-HFPO-DA	SURR	99.9	70 - 130		B1J0066	12-Oct-21	0.243 L	15-Oct-21 00:27	1

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

Results reported to the DL.

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

MW 11/15/21

Vista 7
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW07-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 10:16

Laboratory Data

Lab Sample: 2110075-07
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	30.3 J	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFHxA	307-24-4	69.8 J	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFHpA	375-85-9	15.3 J	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFHxS	355-46-4	78.0 J	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFOA	335-67-1	218 J	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFNA	375-95-1	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFOS	1763-23-1	2.05 J	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFDA	335-76-2	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
MeFOSAA	2355-31-9	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
EtFOSAA	2991-50-6	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFUnA	2058-94-8	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFDoA	307-55-1	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFTrDA	72629-94-8	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
PFTeDA	376-06-7	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
HFPO-DA	13252-13-6	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
ADONA	919005-14-4	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
9Cl-PF3ONS	756426-58-1	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
11Cl-PF3OUdS	763051-92-9	ND	0.754	1.51	2.01		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	114	70 - 130		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
13C2-PFDA	SURR	106	70 - 130		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
d5-EtFOSAA	SURR	93.3	70 - 130		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1
13C3-HFPO-DA	SURR	110	70 - 130		B1J0135	19-Oct-21	0.249 L	25-Oct-21 17:17	1

FD

ISL

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 9
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB07-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 10:23

Laboratory Data

Lab Sample: 2110075-08
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFHxA	307-24-4	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFHpA	375-85-9	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFHxS	355-46-4	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFOA	335-67-1	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFNA	375-95-1	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFOS	1763-23-1	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFDA	335-76-2	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
MeFOSAA	2355-31-9	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
EtFOSAA	2991-50-6	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFUnA	2058-94-8	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFDoA	307-55-1	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFTrDA	72629-94-8	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
PFTeDA	376-06-7	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
HFPO-DA	13252-13-6	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
ADONA	919005-14-4	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
9Cl-PF3ONS	756426-58-1	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
11Cl-PF3OUdS	763051-92-9	ND	0.732	1.46	1.95		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
13C2-PFDA	SURR	96.7	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
d5-EtFOSAA	SURR	89.0	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1
13C3-HFPO-DA	SURR	107	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 00:49	1

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

Results reported to the DL.

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

NW 11/15/21

Vista 9
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW07P-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 10:18

Laboratory Data

Lab Sample: 2110075-09
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	21.9 J	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFHxA	307-24-4	50.5 J	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFHpA	375-85-9	11.2 J	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFHxS	355-46-4	56.5 J	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFOA	335-67-1	160 J	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFNA	375-95-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFOS	1763-23-1	2.05	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFDA	335-76-2	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
MeFOSAA	2355-31-9	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
EtFOSAA	2991-50-6	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFUnA	2058-94-8	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFDoA	307-55-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFTrDA	72629-94-8	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
PFTeDA	376-06-7	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
HFPO-DA	13252-13-6	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
ADONA	919005-14-4	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
9Cl-PF3ONS	756426-58-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
11Cl-PF3OUdS	763051-92-9	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
13C2-PFDA	SURR	98.6	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
d5-EtFOSAA	SURR	86.2	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1
13C3-HFPO-DA	SURR	104	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 01:00	1

FD

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

Results reported to the DL.

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

MW 11/15/21

Vista 10
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-3RW17-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 10:35

Laboratory Data

Lab Sample: 2110075-10
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFHxA	307-24-4	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFHpA	375-85-9	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFHxS	355-46-4	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFOA	335-67-1	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFNA	375-95-1	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFOS	1763-23-1	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFDA	335-76-2	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
MeFOSAA	2355-31-9	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
EtFOSAA	2991-50-6	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFUnA	2058-94-8	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFDoA	307-55-1	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFTrDA	72629-94-8	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
PFTeDA	376-06-7	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
HFPO-DA	13252-13-6	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
ADONA	919005-14-4	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
9Cl-PF3ONS	756426-58-1	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
11Cl-PF3OUdS	763051-92-9	ND	0.758	1.52	2.02		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	107	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
13C2-PFDA	SURR	95.9	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
d5-EtFOSAA	SURR	83.6	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1
13C3-HFPO-DA	SURR	107	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:12	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista II
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-3FB17-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 10:40

Laboratory Data

Lab Sample: 2110075-11
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFHxA	307-24-4	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFHpA	375-85-9	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFHxS	355-46-4	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFOA	335-67-1	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFNA	375-95-1	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFOS	1763-23-1	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFDA	335-76-2	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
MeFOSAA	2355-31-9	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
EtFOSAA	2991-50-6	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFUnA	2058-94-8	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFDoA	307-55-1	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFTrDA	72629-94-8	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
PFTeDA	376-06-7	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
HFPO-DA	13252-13-6	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
ADONA	919005-14-4	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
9Cl-PF3ONS	756426-58-1	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
11Cl-PF3OUdS	763051-92-9	ND	0.760	1.52	2.03		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	110	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
13C2-PFDA	SURR	96.3	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
d5-EtFOSAA	SURR	86.9	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1
13C3-HFPO-DA	SURR	115	70 - 130		B1J0066	12-Oct-21	0.247 L	15-Oct-21 01:23	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista 12
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-2RW06-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 14:20

Laboratory Data

Lab Sample: 2110075-12
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	48.0	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFHxA	307-24-4	147	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFHpA	375-85-9	22.8	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFHxS	355-46-4	54.4	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFOA	335-67-1	297	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFNA	375-95-1	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFOS	1763-23-1	0.873	0.749	1.50	2.00	J	B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFDA	335-76-2	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
MeFOSAA	2355-31-9	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
EtFOSAA	2991-50-6	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFUnA	2058-94-8	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFDoA	307-55-1	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFTrDA	72629-94-8	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
PFTeDA	376-06-7	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
HFPO-DA	13252-13-6	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
ADONA	919005-14-4	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
9Cl-PF3ONS	756426-58-1	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
11Cl-PF3OUdS	763051-92-9	ND	0.749	1.50	2.00		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	114	70 - 130		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
13C2-PFDA	SURR	98.2	70 - 130		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
d5-EtFOSAA	SURR	88.4	70 - 130		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1
13C3-HFPO-DA	SURR	112	70 - 130		B1J0066	12-Oct-21	0.250 L	15-Oct-21 01:34	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 13
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-2FB06-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 14:25

Laboratory Data

Lab Sample: 2110075-13
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFHxA	307-24-4	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFHpA	375-85-9	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFHxS	355-46-4	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFOA	335-67-1	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFNA	375-95-1	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFOS	1763-23-1	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFDA	335-76-2	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
MeFOSAA	2355-31-9	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
EtFOSAA	2991-50-6	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFUnA	2058-94-8	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFDoA	307-55-1	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFTrDA	72629-94-8	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
PFTeDA	376-06-7	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
HFPO-DA	13252-13-6	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
ADONA	919005-14-4	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
9Cl-PF3ONS	756426-58-1	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
11Cl-PF3OUdS	763051-92-9	ND	0.770	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	110	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
13C2-PFDA	SURR	102	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
d5-EtFOSAA	SURR	84.6	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1
13C3-HFPO-DA	SURR	112	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 01:45	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 14
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW01-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 05-Oct-21 14:52

Laboratory Data

Lab Sample: 2110075-14
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	17.0	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFHxA	307-24-4	39.3	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFHpA	375-85-9	12.6	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFHxS	355-46-4	135	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFOA	335-67-1	140	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFNA	375-95-1	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFOS	1763-23-1	1.37	0.733	1.46	1.96	J	B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFDA	335-76-2	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
MeFOSAA	2355-31-9	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
EtFOSAA	2991-50-6	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFUnA	2058-94-8	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFDoA	307-55-1	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFTrDA	72629-94-8	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
PFTeDA	376-06-7	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
HFPO-DA	13252-13-6	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
ADONA	919005-14-4	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
9Cl-PF3ONS	756426-58-1	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
11Cl-PF3OUdS	763051-92-9	ND	0.733	1.46	1.96		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	111	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
13C2-PFDA	SURR	100	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
d5-EtFOSAA	SURR	98.5	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1
13C3-HFPO-DA	SURR	111	70 - 130		B1J0066	12-Oct-21	0.256 L	15-Oct-21 01:56	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista an Enthalpy Analytical Laboratory 15

Sample ID: WI-CV-1FB01-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 05-Oct-21 14:57

Laboratory Data

Lab Sample: 2110075-15
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFHxA	307-24-4	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFHpA	375-85-9	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFHxS	355-46-4	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFOA	335-67-1	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFNA	375-95-1	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFOS	1763-23-1	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFDA	335-76-2	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
MeFOSAA	2355-31-9	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
EtFOSAA	2991-50-6	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFUnA	2058-94-8	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFDoA	307-55-1	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFTrDA	72629-94-8	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
PFTeDA	376-06-7	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
HFPO-DA	13252-13-6	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
ADONA	919005-14-4	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
9Cl-PF3ONS	756426-58-1	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
11Cl-PF3OUdS	763051-92-9	ND	0.752	1.51	2.01		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
13C2-PFDA	SURR	94.5	70 - 130		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
d5-EtFOSAA	SURR	83.9	70 - 130		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1
13C3-HFPO-DA	SURR	111	70 - 130		B1J0066	12-Oct-21	0.249 L	15-Oct-21 02:07	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 16
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW40-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 15:16

Laboratory Data

Lab Sample: 2110075-16
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFHxA	307-24-4	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFHpA	375-85-9	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFHxS	355-46-4	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFOA	335-67-1	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFNA	375-95-1	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFOS	1763-23-1	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFDA	335-76-2	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
MeFOSAA	2355-31-9	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
EtFOSAA	2991-50-6	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFUnA	2058-94-8	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFDoA	307-55-1	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFTrDA	72629-94-8	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
PFTeDA	376-06-7	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
HFPO-DA	13252-13-6	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
ADONA	919005-14-4	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
9Cl-PF3ONS	756426-58-1	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
11Cl-PF3OUdS	763051-92-9	ND	0.722	1.44	1.93		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	113	70 - 130		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
13C2-PFDA	SURR	103	70 - 130		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
d5-EtFOSAA	SURR	89.0	70 - 130		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1
13C3-HFPO-DA	SURR	114	70 - 130		B1J0066	12-Oct-21	0.260 L	15-Oct-21 02:18	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 17
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB40-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 15:21

Laboratory Data

Lab Sample: 2110075-17
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFHxA	307-24-4	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFHpA	375-85-9	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFHxS	355-46-4	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFOA	335-67-1	ND UJ	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	ISL
PFNA	375-95-1	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFOS	1763-23-1	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFDA	335-76-2	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
MeFOSAA	2355-31-9	ND UJ	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	ISL
EtFOSAA	2991-50-6	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFUnA	2058-94-8	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFDoA	307-55-1	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFTrDA	72629-94-8	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
PFTeDA	376-06-7	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
HFPO-DA	13252-13-6	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
ADONA	919005-14-4	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
9Cl-PF3ONS	756426-58-1	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	
11Cl-PF3OUdS	763051-92-9	ND	0.740	1.48	1.97		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1	

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104	70 - 130		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1
13C2-PFDA	SURR	104	70 - 130		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1
d5-EtFOSAA	SURR	92.9	70 - 130		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1
13C3-HFPO-DA	SURR	103	70 - 130		B1J0135	19-Oct-21	0.253 L	25-Oct-21 17:28	1

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

Results reported to the DL.

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

MW 11/15/21

Vista 18
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW67-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 17:21

Laboratory Data

Lab Sample: 2110075-18
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFHxA	307-24-4	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFHpA	375-85-9	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFHxS	355-46-4	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFOA	335-67-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFNA	375-95-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFOS	1763-23-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFDA	335-76-2	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
MeFOSAA	2355-31-9	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
EtFOSAA	2991-50-6	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFUnA	2058-94-8	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFDoA	307-55-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFTrDA	72629-94-8	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
PFTeDA	376-06-7	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
HFPO-DA	13252-13-6	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
ADONA	919005-14-4	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
9Cl-PF3ONS	756426-58-1	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
11Cl-PF3OUdS	763051-92-9	ND	0.737	1.47	1.96		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	112	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
13C2-PFDA	SURR	92.0	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
d5-EtFOSAA	SURR	81.7	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1
13C3-HFPO-DA	SURR	114	70 - 130		B1J0066	12-Oct-21	0.255 L	15-Oct-21 02:40	1

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

Results reported to the DL.

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

nw 11/15/21

Vista 19
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB67-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 05-Oct-21 17:26

Laboratory Data

Lab Sample: 2110075-19
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFHxA	307-24-4	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFHpA	375-85-9	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFHxS	355-46-4	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFOA	335-67-1	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFNA	375-95-1	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFOS	1763-23-1	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFDA	335-76-2	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
MeFOSAA	2355-31-9	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
EtFOSAA	2991-50-6	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFUnA	2058-94-8	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFDoA	307-55-1	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFTrDA	72629-94-8	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
PFTeDA	376-06-7	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
HFPO-DA	13252-13-6	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
ADONA	919005-14-4	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
9Cl-PF3ONS	756426-58-1	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
11Cl-PF3OUdS	763051-92-9	ND	0.767	1.54	2.05		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	110	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
13C2-PFDA	SURR	92.6	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
d5-EtFOSAA	SURR	88.0	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1
13C3-HFPO-DA	SURR	111	70 - 130		B1J0066	12-Oct-21	0.244 L	15-Oct-21 02:51	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 2110076
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Residential Wells, CTO-4470, Washington
Date: November 15, 2021

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-AF-1RW32-1021	2110076-01	Water
2	WI-AF-1FB32-1021	2110076-02	Water
3	WI-AF-1RW51-1021	2110076-03	Water
4	WI-AF-1FB51-1021	2110076-04	Water
5	WI-AF-1RW33-1021	2110076-05	Water
6	WI-AF-1FB33-1021	2110076-06	Water
7	WI-A06-RW14-1021	2110076-07	Water
8	WI-A06-FB14-1021	2110076-08	Water
9	WI-A06-RW03-1021	2110076-09	Water
10	WI-A06-RW03P-1021	2110076-10	Water
11	WI-A06-FB03-1021	2110076-11	Water
12	WI-A06-RW04-1021	2110076-12	Water
13	WI-A06-FB04-1021	2110076-13	Water
14	WI-AF-1RW28-1021	2110076-14	Water
14MS	WI-AF-1RW28-1021MS	2110076-14MS	Water
14MSD	WI-AF-1RW28-1021MSD	2110076-14MSD	Water
15	WI-AF-1FB28-1021	2110076-15	Water
16	WI-AF-1RW68-1021	2110076-16	Water
17	WI-AF-1FB68-1021	2110076-17	Water
18	WI-AF-1RW40-1021	2110076-18	Water
19	WI-AF-1FB40-1021	2110076-19	Water

A full data validation was performed on the analytical data for ten water samples and nine aqueous field blank samples collected on October 6, 2020 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	*Method References*
PFAS	USEPA Method 537.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Final Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water Ault Field, Area 6, and Outlying Landing Field Coupeville, Naval Air Station Whidbey Island, April 2020, the DoD Final General Data Validation Guidelines, November 2019, and the USEPA Data Review and Validation Guidelines as follows:

- The USEPA "Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537," November 2018;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Stage 2B/4) data validation was performed with this review including a recalculation of 100% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes as qualified for the deficiencies detailed in this report.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedances of QC criteria.

Perfluorinated Alkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-AF-1FB32-1021	None - ND	-	-	-
WI-AF-1FB51-1021	None - ND	-	-	-
WI-AF-1FB33-1021	None - ND	-	-	-
WI-A06-FB14-1021	None - ND	-	-	-
WI-A06-FB03-1021	None - ND	-	-	-
WI-A06-FB04-1021	None - ND	-	-	-
WI-AF-1FB28-1021	None - ND	-	-	-
WI-AF-1FB68-1021	None - ND	-	-	-
WI-AF-1FB40-1021	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria except for the following.

EDS Sample	Internal Standard	Area Count	Qualifier
10	13C2-PFOA	High	J - PFOA
	D3-N-MeFOSAA	High	None - Sample ND

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples are summarized below. The precision was acceptable.

Compound	WI-A06-RW03-1021 ng/L	WI-A06-RW03P-1021 ng/L	RPD	Qualifier
PFBS	42.7	45.3	6%	None
PFHxA	61.3	59.5	3%	
PFHpA	22.7	21.6	5%	
PFHxS	124	124	0%	
PFOA	41.4	39.7	4%	
PFNA	0.786	0.777	1%	
PFOS	21.5	23.6	9%	

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 11/17/21

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1RW32-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 09:37

Laboratory Data

Lab Sample: 2110076-01
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	276	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFHxA	307-24-4	204	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFHpA	375-85-9	21.4	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFHxS	355-46-4	1150	38.7	77.5	103	J	B1J0138	13-Oct-21	0.242 L	25-Oct-21 23:00	50
PFOA	335-67-1	42.5	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFNA	375-95-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFOS	1763-23-1	4720	38.7	77.5	103	J	B1J0138	13-Oct-21	0.242 L	25-Oct-21 23:00	50
PFDA	335-76-2	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
MeFOSAA	2355-31-9	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
EtFOSAA	2991-50-6	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFUnA	2058-94-8	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFDoA	307-55-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFTrDA	72629-94-8	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
PFTeDA	376-06-7	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
HFPO-DA	13252-13-6	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
ADONA	919005-14-4	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
9Cl-PF3ONS	756426-58-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
11Cl-PF3OUdS	763051-92-9	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	115	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
13C2-PFDA	SURR	109	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
d5-EtFOSAA	SURR	94.1	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1
13C3-HFPO-DA	SURR	119	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 17:05	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 2
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1FB32-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 09:42

Laboratory Data

Lab Sample: 2110076-02
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFHxA	307-24-4	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFHpA	375-85-9	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFHxS	355-46-4	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFOA	335-67-1	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFNA	375-95-1	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFOS	1763-23-1	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFDA	335-76-2	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
MeFOSAA	2355-31-9	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
EtFOSAA	2991-50-6	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFUnA	2058-94-8	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFDoA	307-55-1	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFTrDA	72629-94-8	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
PFTeDA	376-06-7	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
HFPO-DA	13252-13-6	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
ADONA	919005-14-4	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
9Cl-PF3ONS	756426-58-1	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
11Cl-PF3OUdS	763051-92-9	ND	0.741	1.48	1.98		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	103	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
13C2-PFDA	SURR	96.7	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
d5-EtFOSAA	SURR	83.5	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1
13C3-HFPO-DA	SURR	106	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 18:57	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MWillis121

Vista 3
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1RW51-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 09:13

Laboratory Data

Lab Sample: 2110076-03
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFHxA	307-24-4	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFHpA	375-85-9	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFHxS	355-46-4	0.963	0.718	1.44	1.91	J	B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFOA	335-67-1	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFNA	375-95-1	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFOS	1763-23-1	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFDA	335-76-2	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
MeFOSAA	2355-31-9	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
EtFOSAA	2991-50-6	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFUnA	2058-94-8	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFDoA	307-55-1	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFTrDA	72629-94-8	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
PFTeDA	376-06-7	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
HFPO-DA	13252-13-6	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
ADONA	919005-14-4	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
9Cl-PF3ONS	756426-58-1	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
11Cl-PF3OUdS	763051-92-9	ND	0.718	1.44	1.91		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	109	70 - 130		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
13C2-PFDA	SURR	104	70 - 130		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
d5-EtFOSAA	SURR	94.3	70 - 130		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1
13C3-HFPO-DA	SURR	113	70 - 130		B1J0138	20-Oct-21	0.261 L	25-Oct-21 19:08	1

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

Results reported to the DL.

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

mw 11/15/21

Vista 4
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1FB51-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 09:18

Laboratory Data

Lab Sample: 2110076-04
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFHxA	307-24-4	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFHpA	375-85-9	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFHxS	355-46-4	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFOA	335-67-1	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFNA	375-95-1	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFOS	1763-23-1	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFDA	335-76-2	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
MeFOSAA	2355-31-9	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
EtFOSAA	2991-50-6	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFUnA	2058-94-8	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFDoA	307-55-1	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFTrDA	72629-94-8	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
PFTeDA	376-06-7	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
HFPO-DA	13252-13-6	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
ADONA	919005-14-4	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
9Cl-PF3ONS	756426-58-1	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
11Cl-PF3OUdS	763051-92-9	ND	0.754	1.51	2.01		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	121	70 - 130		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
13C2-PFDA	SURR	116	70 - 130		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
d5-EtFOSAA	SURR	102	70 - 130		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1
13C3-HFPO-DA	SURR	121	70 - 130		B1J0138	20-Oct-21	0.249 L	25-Oct-21 19:19	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 5
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1RW33-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 06-Oct-21 10:24

Laboratory Data

Lab Sample: 2110076-05
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	74.7	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFHxA	307-24-4	82.7	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFHpA	375-85-9	3.22	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFHxS	355-46-4	10.6	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFOA	335-67-1	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFNA	375-95-1	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFOS	1763-23-1	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFDA	335-76-2	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
MeFOSAA	2355-31-9	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
EtFOSAA	2991-50-6	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFUnA	2058-94-8	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFDoA	307-55-1	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFTrDA	72629-94-8	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
PFTeDA	376-06-7	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
HFPO-DA	13252-13-6	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
ADONA	919005-14-4	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
9Cl-PF3ONS	756426-58-1	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
11Cl-PF3OUdS	763051-92-9	ND	0.727	1.45	1.94		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	120	70 - 130		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
13C2-PFDA	SURR	114	70 - 130		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
d5-EtFOSAA	SURR	93.7	70 - 130		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1
13C3-HFPO-DA	SURR	117	70 - 130		B1J0138	20-Oct-21	0.258 L	25-Oct-21 19:30	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

mw 11/15/21

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Sample ID: WI-AF-1FB33-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 10:29

Laboratory Data

Lab Sample: 2110076-06
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFHxA	307-24-4	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFHpA	375-85-9	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFHxS	355-46-4	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFOA	335-67-1	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFNA	375-95-1	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFOS	1763-23-1	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFDA	335-76-2	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
MeFOSAA	2355-31-9	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
EtFOSAA	2991-50-6	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFUnA	2058-94-8	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFDoA	307-55-1	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFTrDA	72629-94-8	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
PFTeDA	376-06-7	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
HFPO-DA	13252-13-6	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
ADONA	919005-14-4	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
9Cl-PF3ONS	756426-58-1	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
11Cl-PF3OUdS	763051-92-9	ND	0.746	1.49	1.99		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	127	70 - 130		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
13C2-PFDA	SURR	124	70 - 130		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
d5-EtFOSAA	SURR	111	70 - 130		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1
13C3-HFPO-DA	SURR	128	70 - 130		B1J0138	20-Oct-21	0.251 L	25-Oct-21 19:41	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

Nw 11/15/21

Vista 7
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-RW14-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 10:59

Laboratory Data

Lab Sample: 2110076-07
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	59.1	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFHxA	307-24-4	73.0	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFHpA	375-85-9	18.3	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFHxS	355-46-4	228	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFOA	335-67-1	25.5	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFNA	375-95-1	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFOS	1763-23-1	17.0	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFDA	335-76-2	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
MeFOSAA	2355-31-9	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
EtFOSAA	2991-50-6	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFUnA	2058-94-8	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFDoA	307-55-1	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFTrDA	72629-94-8	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
PFTeDA	376-06-7	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
HFPO-DA	13252-13-6	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
ADONA	919005-14-4	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
9Cl-PF3ONS	756426-58-1	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
11Cl-PF3OUdS	763051-92-9	ND	0.771	1.54	2.06		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	109	70 - 130		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
13C2-PFDA	SURR	99.5	70 - 130		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
d5-EtFOSAA	SURR	89.4	70 - 130		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1
13C3-HFPO-DA	SURR	115	70 - 130		B1J0138	20-Oct-21	0.243 L	25-Oct-21 20:25	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL.
When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

MW 11.5.21

Vista
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Sample ID: WI-A06-FB14-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 11:04

Laboratory Data

Lab Sample: 2110076-08
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFHxA	307-24-4	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFHpA	375-85-9	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFHxS	355-46-4	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFOA	335-67-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFNA	375-95-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFOS	1763-23-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFDA	335-76-2	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
MeFOSAA	2355-31-9	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
EtFOSAA	2991-50-6	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFUnA	2058-94-8	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFDoA	307-55-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFTrDA	72629-94-8	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
PFTeDA	376-06-7	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
HFPO-DA	13252-13-6	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
ADONA	919005-14-4	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
9Cl-PF3ONS	756426-58-1	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
11Cl-PF3OUdS	763051-92-9	ND	0.773	1.55	2.06		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	103	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
13C2-PFDA	SURR	102	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
d5-EtFOSAA	SURR	98.2	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1
13C3-HFPO-DA	SURR	106	70 - 130		B1J0138	20-Oct-21	0.242 L	26-Oct-21 15:25	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 9
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-RW03-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 13:08

Laboratory Data

Lab Sample: 2110076-09
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	42.7	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFHxA	307-24-4	61.3	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFHpA	375-85-9	22.7	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFHxS	355-46-4	124	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFOA	335-67-1	41.4	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFNA	375-95-1	0.786	0.736	1.47	1.96	J	B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFOS	1763-23-1	21.5	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFDA	335-76-2	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
MeFOSAA	2355-31-9	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
EtFOSAA	2991-50-6	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFUnA	2058-94-8	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFDoA	307-55-1	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFTrDA	72629-94-8	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
PFTeDA	376-06-7	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
HFPO-DA	13252-13-6	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
ADONA	919005-14-4	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
9Cl-PF3ONS	756426-58-1	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
11Cl-PF3OUdS	763051-92-9	ND	0.736	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	120	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
13C2-PFDA	SURR	114	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
d5-EtFOSAA	SURR	94.8	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1
13C3-HFPO-DA	SURR	121	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 15:37	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

Vista lb
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-RW03P-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 13:10

Laboratory Data

Lab Sample: 2110076-10
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	45.3	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFHxA	307-24-4	59.5	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFHpA	375-85-9	21.6	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFHxS	355-46-4	124	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFOA	335-67-1	39.7 J	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFNA	375-95-1	0.777	0.745	1.49	1.99	J	B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFOS	1763-23-1	23.6	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFDA	335-76-2	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
MeFOSAA	2355-31-9	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
EtFOSAA	2991-50-6	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFUnA	2058-94-8	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFDoA	307-55-1	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFTrDA	72629-94-8	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
PFTeDA	376-06-7	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
HFPO-DA	13252-13-6	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
ADONA	919005-14-4	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
9Cl-PF3ONS	756426-58-1	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
11Cl-PF3OUdS	763051-92-9	ND	0.745	1.49	1.99		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	117	70 - 130		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
13C2-PFDA	SURR	114	70 - 130		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
d5-EtFOSAA	SURR	103	70 - 130		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1
13C3-HFPO-DA	SURR	117	70 - 130		B1J0138	20-Oct-21	0.252 L	26-Oct-21 15:48	1

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

Results reported to the DL.

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

JSH

NW 11/15/21

Vista II
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-FB03-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 06-Oct-21 13:15

Laboratory Data

Lab Sample: 2110076-11
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFHxA	307-24-4	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFHpA	375-85-9	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFHxS	355-46-4	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFOA	335-67-1	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFNA	375-95-1	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFOS	1763-23-1	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFDA	335-76-2	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
MeFOSAA	2355-31-9	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
EtFOSAA	2991-50-6	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFUnA	2058-94-8	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFDoA	307-55-1	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFTrDA	72629-94-8	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
PFTeDA	376-06-7	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
HFPO-DA	13252-13-6	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
ADONA	919005-14-4	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
9Cl-PF3ONS	756426-58-1	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
11Cl-PF3OUdS	763051-92-9	ND	0.778	1.56	2.07		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
13C2-PFDA	SURR	98.4	70 - 130		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
d5-EtFOSAA	SURR	90.8	70 - 130		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1
13C3-HFPO-DA	SURR	106	70 - 130		B1J0138	20-Oct-21	0.241 L	26-Oct-21 15:59	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista
an Enthalpy Analytical Laboratory

12

Sample ID: WI-A06-RW04-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 06-Oct-21 13:42

Laboratory Data

Lab Sample: 2110076-12
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	36.0	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFHxA	307-24-4	12.3	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFHpA	375-85-9	6.99	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFHxS	355-46-4	86.3	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFOA	335-67-1	9.03	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFNA	375-95-1	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFOS	1763-23-1	12.7	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFDA	335-76-2	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
MeFOSAA	2355-31-9	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
EtFOSAA	2991-50-6	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFUnA	2058-94-8	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFDoA	307-55-1	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFTrDA	72629-94-8	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
PFTeDA	376-06-7	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
HFPO-DA	13252-13-6	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
ADONA	919005-14-4	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
9Cl-PF3ONS	756426-58-1	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
11Cl-PF3OUdS	763051-92-9	ND	0.748	1.49	2.00		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	106	70 - 130		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
13C2-PFDA	SURR	106	70 - 130		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
d5-EtFOSAA	SURR	89.2	70 - 130		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1
13C3-HFPO-DA	SURR	108	70 - 130		B1J0138	20-Oct-21	0.251 L	26-Oct-21 16:10	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 13
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-FB04-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 06-Oct-21 13:47

Laboratory Data

Lab Sample: 2110076-13
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFHxA	307-24-4	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFHpA	375-85-9	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFHxS	355-46-4	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFOA	335-67-1	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFNA	375-95-1	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFOS	1763-23-1	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFDA	335-76-2	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
MeFOSAA	2355-31-9	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
EtFOSAA	2991-50-6	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFUnA	2058-94-8	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFDoA	307-55-1	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFTrDA	72629-94-8	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
PFTeDA	376-06-7	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
HFPO-DA	13252-13-6	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
ADONA	919005-14-4	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
9Cl-PF3ONS	756426-58-1	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
11Cl-PF3OUdS	763051-92-9	ND	0.739	1.48	1.97		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	112	70 - 130		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
13C2-PFDA	SURR	115	70 - 130		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
d5-EtFOSAA	SURR	103	70 - 130		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1
13C3-HFPO-DA	SURR	115	70 - 130		B1J0138	20-Oct-21	0.254 L	26-Oct-21 16:21	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 14
an Enthalpy Analytical Laboratory

Sample ID: WI-AF-1RW28-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 11:44

Laboratory Data

Lab Sample: 2110076-14
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	3.65	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFHxA	307-24-4	7.26	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFHpA	375-85-9	4.41	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFHxS	355-46-4	11.5	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFOA	335-67-1	41.6	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFNA	375-95-1	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFOS	1763-23-1	1.25	0.734	1.47	1.96	J	B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFDA	335-76-2	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
MeFOSAA	2355-31-9	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
EtFOSAA	2991-50-6	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFUnA	2058-94-8	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFDoA	307-55-1	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFTrDA	72629-94-8	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
PFTeDA	376-06-7	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
HFPO-DA	13252-13-6	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
ADONA	919005-14-4	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
9Cl-PF3ONS	756426-58-1	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
11Cl-PF3OUdS	763051-92-9	ND	0.734	1.47	1.96		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	128	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
13C2-PFDA	SURR	119	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
d5-EtFOSAA	SURR	111	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1
13C3-HFPO-DA	SURR	130	70 - 130		B1J0138	20-Oct-21	0.255 L	26-Oct-21 16:32	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 15
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Sample ID: WI-AF-1FB28-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 06-Oct-21 11:49

Laboratory Data

Lab Sample: 2110076-15
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFHxA	307-24-4	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFHpA	375-85-9	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFHxS	355-46-4	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFOA	335-67-1	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFNA	375-95-1	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFOS	1763-23-1	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFDA	335-76-2	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
MeFOSAA	2355-31-9	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
EtFOSAA	2991-50-6	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFUnA	2058-94-8	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFDoA	307-55-1	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFTrDA	72629-94-8	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
PFTeDA	376-06-7	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
HFPO-DA	13252-13-6	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
ADONA	919005-14-4	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
9Cl-PF3ONS	756426-58-1	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
11Cl-PF3OUdS	763051-92-9	ND	0.738	1.48	1.97		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	113	70 - 130		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
13C2-PFDA	SURR	105	70 - 130		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
d5-EtFOSAA	SURR	92.7	70 - 130		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1
13C3-HFPO-DA	SURR	109	70 - 130		B1J0138	20-Oct-21	0.254 L	25-Oct-21 21:54	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

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Sample ID: WI-AF-1RW68-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 16:09

Laboratory Data

Lab Sample: 2110076-16
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFHxA	307-24-4	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFHpA	375-85-9	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFHxS	355-46-4	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFOA	335-67-1	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFNA	375-95-1	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFOS	1763-23-1	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFDA	335-76-2	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
MeFOSAA	2355-31-9	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
EtFOSAA	2991-50-6	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFUnA	2058-94-8	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFDoA	307-55-1	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFTrDA	72629-94-8	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
PFTeDA	376-06-7	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
HFPO-DA	13252-13-6	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
ADONA	919005-14-4	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
9Cl-PF3ONS	756426-58-1	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
11Cl-PF3OUdS	763051-92-9	ND	0.740	1.48	1.97		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	99.3	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
13C2-PFDA	SURR	88.0	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
d5-EtFOSAA	SURR	74.7	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1
13C3-HFPO-DA	SURR	101	70 - 130		B1J0138	20-Oct-21	0.253 L	25-Oct-21 22:05	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

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17

Sample ID: WI-AF-1FB68-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 06-Oct-21 16:14

Laboratory Data

Lab Sample: 2110076-17
Date Received: 08-Oct-21 09:46

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFHxA	307-24-4	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFHpA	375-85-9	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFHxS	355-46-4	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFOA	335-67-1	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFNA	375-95-1	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFOS	1763-23-1	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFDA	335-76-2	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
MeFOSAA	2355-31-9	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
EtFOSAA	2991-50-6	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFUnA	2058-94-8	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFDoA	307-55-1	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFTrDA	72629-94-8	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
PFTeDA	376-06-7	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
HFPO-DA	13252-13-6	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
ADONA	919005-14-4	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
9Cl-PF3ONS	756426-58-1	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
11Cl-PF3OUdS	763051-92-9	ND	0.744	1.49	1.98		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	110	70 - 130		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
13C2-PFDA	SURR	104	70 - 130		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
d5-EtFOSAA	SURR	93.3	70 - 130		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1
13C3-HFPO-DA	SURR	107	70 - 130		B1J0138	20-Oct-21	0.252 L	25-Oct-21 22:16	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista 18
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Sample ID: WI-AF-1RW40-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 11:25

Laboratory Data

Lab Sample: 2110076-18
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	2.09	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFHxA	307-24-4	1.64	0.716	1.43	1.91	J	B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFHpA	375-85-9	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFHxS	355-46-4	6.19	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFOA	335-67-1	3.98	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFNA	375-95-1	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFOS	1763-23-1	4.90	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFDA	335-76-2	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
MeFOSAA	2355-31-9	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
EtFOSAA	2991-50-6	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFUnA	2058-94-8	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFDoA	307-55-1	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFTrDA	72629-94-8	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
PFTeDA	376-06-7	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
HFPO-DA	13252-13-6	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
ADONA	919005-14-4	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
9Cl-PF3ONS	756426-58-1	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
11Cl-PF3OUdS	763051-92-9	ND	0.716	1.43	1.91		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	124	70 - 130		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
13C2-PFDA	SURR	113	70 - 130		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
d5-EtFOSAA	SURR	97.5	70 - 130		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1
13C3-HFPO-DA	SURR	125	70 - 130		B1J0138	20-Oct-21	0.262 L	26-Oct-21 16:43	1

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

Results reported to the DL.

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

11/15/21

Sample ID: WI-AF-1FB40-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 06-Oct-21 11:30

Laboratory Data

Lab Sample: 2110076-19
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFHxA	307-24-4	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFHpA	375-85-9	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFHxS	355-46-4	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFOA	335-67-1	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFNA	375-95-1	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFOS	1763-23-1	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFDA	335-76-2	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
MeFOSAA	2355-31-9	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
EtFOSAA	2991-50-6	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFUnA	2058-94-8	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFDoA	307-55-1	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFTrDA	72629-94-8	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
PFTeDA	376-06-7	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
HFPO-DA	13252-13-6	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
ADONA	919005-14-4	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
9Cl-PF3ONS	756426-58-1	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
11Cl-PF3OUdS	763051-92-9	ND	0.770	1.54	2.05		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	116	70 - 130		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
13C2-PFDA	SURR	114	70 - 130		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
d5-EtFOSAA	SURR	96.2	70 - 130		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1
13C3-HFPO-DA	SURR	117	70 - 130		B1J0138	20-Oct-21	0.244 L	26-Oct-21 16:54	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL
When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

NW 11/15/21

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 2110077
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Residential Wells, CTO-4470, Washington
Date: November 15, 2021

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW27-1021	2110077-01	Water
2	WI-CV-1FB27-1021	2110077-02	Water
3	WI-CV-1RW25-1021	2110077-03	Water
4	WI-CV-1FB25-1021	2110077-04	Water
5	WI-CV-1RW26-1021	2110077-05	Water
6	WI-CV-1RW26P-1021	2110077-06	Water
7	WI-CV-1FB26-1021	2110077-07	Water
8	WI-CV-1RW23-1021	2110077-08	Water
9	WI-CV-1FB23-1021	2110077-09	Water
10	WI-CV-3RW07-1021	2110077-10	Water
11	WI-CV-3FB07-1021	2110077-11	Water
12	WI-CV-1RW22-1021	2110077-12	Water
13	WI-CV-1FB22-1021	2110077-13	Water
14	WI-CV-1RW37-1021	2110077-14	Water
15	WI-CV-1FB37-1021	2110077-15	Water
16	WI-A06-1RW19-1021	2110077-16	Water
17	WI-A06-1FB19-1021	2110077-17	Water
18	WI-CV-1RW24-1021	2110077-18	Water
19	WI-CV-1FB24-1021	2110077-19	Water

A full data validation was performed on the analytical data for ten water samples and nine aqueous field blank samples collected on October 7, 2020 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	*Method References*
PFAS	USEPA Method 537.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Final Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water Ault Field, Area 6, and Outlying Landing

Field Coupeville, Naval Air Station Whidbey Island, April 2020, the DoD Final General Data Validation Guidelines, November 2019, and the USEPA Data Review and Validation Guidelines as follows:

- The USEPA "Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537," November 2018;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Stage 2B/4) data validation was performed with this review including a recalculation of 100% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Alkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-1FB27-1021	None - ND	-	-	-
WI-CV-1FB25-1021	None - ND	-	-	-
WI-CV-1FB26-1021	None - ND	-	-	-
WI-CV-1FB23-1021	None - ND	-	-	-
WI-CV-3FB07-1021	None - ND	-	-	-
WI-CV-1FB22-1021	None - ND	-	-	-
WI-CV-1FB37-1021	None - ND	-	-	-
WI-A06-1FB19-1021	None - ND	-	-	-
WI-CV-1FB24-1021	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples are summarized below. The precision was acceptable.

Compound	WI-CV-1RW26-1021 ng/L	WI-CV-1RW26P-1021 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 11/17/21

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW27-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 08:30

Laboratory Data

Lab Sample: 2110077-01
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	3.14	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFHxA	307-24-4	14.2	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFHpA	375-85-9	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFHxS	355-46-4	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFOA	335-67-1	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFNA	375-95-1	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFOS	1763-23-1	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFDA	335-76-2	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
MeFOSAA	2355-31-9	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
EtFOSAA	2991-50-6	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFUnA	2058-94-8	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFDoA	307-55-1	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFTrDA	72629-94-8	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
PFTeDA	376-06-7	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
HFPO-DA	13252-13-6	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
ADONA	919005-14-4	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
9Cl-PF3ONS	756426-58-1	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
11Cl-PF3OUdS	763051-92-9	ND	0.718	1.44	1.91		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
13C2-PFDA	SURR	93.0	70 - 130		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
d5-EtFOSAA	SURR	78.3	70 - 130		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1
13C3-HFPO-DA	SURR	96.3	70 - 130		B1J0067	13-Oct-21	0.261 L	19-Oct-21 00:59	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista 2
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB27-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 08:35

Laboratory Data

Lab Sample: 2110077-02
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFHxA	307-24-4	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFHpA	375-85-9	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFHxS	355-46-4	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFOA	335-67-1	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFNA	375-95-1	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFOS	1763-23-1	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFDA	335-76-2	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
MeFOSAA	2355-31-9	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
EtFOSAA	2991-50-6	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFUnA	2058-94-8	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFDoA	307-55-1	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFTrDA	72629-94-8	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
PFTeDA	376-06-7	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
HFPO-DA	13252-13-6	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
ADONA	919005-14-4	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
9Cl-PF3ONS	756426-58-1	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
11Cl-PF3OUdS	763051-92-9	ND	0.751	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	109	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
13C2-PFDA	SURR	94.3	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
d5-EtFOSAA	SURR	91.0	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1
13C3-HFPO-DA	SURR	93.7	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 01:10	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

Vista 3
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW25-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 08:55

Laboratory Data

Lab Sample: 2110077-03
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFHxA	307-24-4	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFHpA	375-85-9	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFHxS	355-46-4	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFOA	335-67-1	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFNA	375-95-1	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFOS	1763-23-1	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFDA	335-76-2	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
MeFOSAA	2355-31-9	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
EtFOSAA	2991-50-6	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFUnA	2058-94-8	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFDoA	307-55-1	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFTrDA	72629-94-8	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
PFTeDA	376-06-7	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
HFPO-DA	13252-13-6	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
ADONA	919005-14-4	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
9Cl-PF3ONS	756426-58-1	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
11Cl-PF3OUdS	763051-92-9	ND	0.761	1.52	2.03		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	107	70 - 130		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
13C2-PFDA	SURR	98.3	70 - 130		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
d5-EtFOSAA	SURR	74.7	70 - 130		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1
13C3-HFPO-DA	SURR	96.8	70 - 130		B1J0067	13-Oct-21	0.246 L	19-Oct-21 01:21	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

Vista 4
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB25-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 09:00

Laboratory Data

Lab Sample: 2110077-04
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFHxA	307-24-4	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFHpA	375-85-9	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFHxS	355-46-4	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFOA	335-67-1	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFNA	375-95-1	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFOS	1763-23-1	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFDA	335-76-2	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
MeFOSAA	2355-31-9	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
EtFOSAA	2991-50-6	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFUnA	2058-94-8	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFDoA	307-55-1	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFTrDA	72629-94-8	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
PFTeDA	376-06-7	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
HFPO-DA	13252-13-6	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
ADONA	919005-14-4	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
9Cl-PF3ONS	756426-58-1	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
11Cl-PF3OUdS	763051-92-9	ND	0.779	1.56	2.08		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	110	70 - 130		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
13C2-PFDA	SURR	97.1	70 - 130		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
d5-EtFOSAA	SURR	87.4	70 - 130		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1
13C3-HFPO-DA	SURR	97.9	70 - 130		B1J0067	13-Oct-21	0.241 L	19-Oct-21 01:32	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MJ 11/15/21

Vista 5
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW26-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 09:11

Laboratory Data

Lab Sample: 2110077-05
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFHxA	307-24-4	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFHpA	375-85-9	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFHxS	355-46-4	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFOA	335-67-1	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFNA	375-95-1	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFOS	1763-23-1	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFDA	335-76-2	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
MeFOSAA	2355-31-9	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
EtFOSAA	2991-50-6	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFUnA	2058-94-8	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFDoA	307-55-1	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFTrDA	72629-94-8	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
PFTeDA	376-06-7	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
HFPO-DA	13252-13-6	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
ADONA	919005-14-4	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
9Cl-PF3ONS	756426-58-1	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
11Cl-PF3OUdS	763051-92-9	ND	0.748	1.49	2.00		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	103	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
13C2-PFDA	SURR	91.0	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
d5-EtFOSAA	SURR	74.4	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1
13C3-HFPO-DA	SURR	92.9	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 01:43	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL

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

11/15/21

Vista b
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW26P-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 09:13

Laboratory Data

Lab Sample: 2110077-06
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFHxA	307-24-4	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFHpA	375-85-9	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFHxS	355-46-4	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFOA	335-67-1	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFNA	375-95-1	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFOS	1763-23-1	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFDA	335-76-2	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
MeFOSAA	2355-31-9	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
EtFOSAA	2991-50-6	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFUnA	2058-94-8	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFDoA	307-55-1	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFTrDA	72629-94-8	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
PFTeDA	376-06-7	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
HFPO-DA	13252-13-6	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
ADONA	919005-14-4	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
9Cl-PF3ONS	756426-58-1	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
11Cl-PF3OUdS	763051-92-9	ND	0.744	1.49	1.98		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	109	70 - 130		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
13C2-PFDA	SURR	95.2	70 - 130		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
d5-EtFOSAA	SURR	75.2	70 - 130		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1
13C3-HFPO-DA	SURR	98.0	70 - 130		B1J0067	13-Oct-21	0.252 L	19-Oct-21 01:54	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 7
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB26-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 09:16

Laboratory Data

Lab Sample: 2110077-07
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFHxA	307-24-4	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFHpA	375-85-9	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFHxS	355-46-4	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFOA	335-67-1	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFNA	375-95-1	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFOS	1763-23-1	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFDA	335-76-2	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
MeFOSAA	2355-31-9	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
EtFOSAA	2991-50-6	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFUnA	2058-94-8	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFDoA	307-55-1	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFTrDA	72629-94-8	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
PFTeDA	376-06-7	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
HFPO-DA	13252-13-6	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
ADONA	919005-14-4	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
9Cl-PF3ONS	756426-58-1	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
11Cl-PF3OUdS	763051-92-9	ND	0.768	1.54	2.05		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
13C2-PFDA	SURR	87.5	70 - 130		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
d5-EtFOSAA	SURR	85.0	70 - 130		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1
13C3-HFPO-DA	SURR	87.8	70 - 130		B1J0067	13-Oct-21	0.244 L	19-Oct-21 02:05	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/1/21

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Sample ID: WI-CV-1RW23-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 09:48

Laboratory Data

Lab Sample: 2110077-08
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	15.3	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFHxA	307-24-4	29.4	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFHpA	375-85-9	7.27	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFHxS	355-46-4	48.9	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFOA	335-67-1	49.0	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFNA	375-95-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFOS	1763-23-1	1.34	0.729	1.46	1.94	J	B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFDA	335-76-2	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
MeFOSAA	2355-31-9	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
EtFOSAA	2991-50-6	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFUnA	2058-94-8	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFDoA	307-55-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFTrDA	72629-94-8	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
PFTeDA	376-06-7	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
HFPO-DA	13252-13-6	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
ADONA	919005-14-4	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
9Cl-PF3ONS	756426-58-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
11Cl-PF3OUdS	763051-92-9	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	101	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
13C2-PFDA	SURR	88.0	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
d5-EtFOSAA	SURR	84.9	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1
13C3-HFPO-DA	SURR	92.8	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:16	1

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

Results reported to the DL.

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

MW 11/15/21

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9

Sample ID: WI-CV-1FB23-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 09:53

Laboratory Data

Lab Sample: 2110077-09
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFHxA	307-24-4	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFHpA	375-85-9	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFHxS	355-46-4	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFOA	335-67-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFNA	375-95-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFOS	1763-23-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFDA	335-76-2	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
MeFOSAA	2355-31-9	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
EtFOSAA	2991-50-6	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFUnA	2058-94-8	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFDoA	307-55-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFTrDA	72629-94-8	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
PFTeDA	376-06-7	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
HFPO-DA	13252-13-6	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
ADONA	919005-14-4	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
9Cl-PF3ONS	756426-58-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
11Cl-PF3OUdS	763051-92-9	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.6	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
13C2-PFDA	SURR	85.6	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
d5-EtFOSAA	SURR	75.3	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1
13C3-HFPO-DA	SURR	89.6	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:27	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 10
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-3RW07-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 10:21

Laboratory Data

Lab Sample: 2110077-10
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFHxA	307-24-4	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFHpA	375-85-9	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFHxS	355-46-4	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFOA	335-67-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFNA	375-95-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFOS	1763-23-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFDA	335-76-2	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
MeFOSAA	2355-31-9	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
EtFOSAA	2991-50-6	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFUnA	2058-94-8	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFDoA	307-55-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFTrDA	72629-94-8	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
PFTeDA	376-06-7	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
HFPO-DA	13252-13-6	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
ADONA	919005-14-4	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
9Cl-PF3ONS	756426-58-1	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
11Cl-PF3OUdS	763051-92-9	ND	0.729	1.46	1.94		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	96.4	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
13C2-PFDA	SURR	87.8	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
d5-EtFOSAA	SURR	74.6	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1
13C3-HFPO-DA	SURR	87.7	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 02:38	1

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

Results reported to the DL.

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

MW 11/15/21

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Sample ID: WI-CV-3FB07-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 10:26

Laboratory Data

Lab Sample: 2110077-11
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFHxA	307-24-4	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFHpA	375-85-9	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFHxS	355-46-4	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFOA	335-67-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFNA	375-95-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFOS	1763-23-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFDA	335-76-2	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
MeFOSAA	2355-31-9	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
EtFOSAA	2991-50-6	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFUnA	2058-94-8	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFDoA	307-55-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFTrDA	72629-94-8	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
PFTeDA	376-06-7	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
HFPO-DA	13252-13-6	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
ADONA	919005-14-4	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
9Cl-PF3ONS	756426-58-1	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
11Cl-PF3OUdS	763051-92-9	ND	0.742	1.48	1.98		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.4	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
13C2-PFDA	SURR	85.7	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
d5-EtFOSAA	SURR	93.7	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1
13C3-HFPO-DA	SURR	91.7	70 - 130		B1J0067	13-Oct-21	0.253 L	19-Oct-21 02:49	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista an Enthalpy Analytical Laboratory 12

Sample ID: WI-CV-1RW22-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 11:09

Laboratory Data

Lab Sample: 2110077-12
Date Received: 08-Oct-21 09:46
Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFHxA	307-24-4	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFHpA	375-85-9	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFHxS	355-46-4	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFOA	335-67-1	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFNA	375-95-1	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFOS	1763-23-1	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFDA	335-76-2	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
MeFOSAA	2355-31-9	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
EtFOSAA	2991-50-6	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFUnA	2058-94-8	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFDoA	307-55-1	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFTrDA	72629-94-8	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
PFTeDA	376-06-7	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
HFPO-DA	13252-13-6	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
ADONA	919005-14-4	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
9Cl-PF3ONS	756426-58-1	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
11Cl-PF3OUdS	763051-92-9	ND	0.764	1.53	2.04		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108	70 - 130		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
13C2-PFDA	SURR	108	70 - 130		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
d5-EtFOSAA	SURR	79.8	70 - 130		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1
13C3-HFPO-DA	SURR	111	70 - 130		B1J0135	19-Oct-21	0.245 L	25-Oct-21 17:39	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 13
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB22-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 11:14

Laboratory Data

Lab Sample: 2110077-13
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFHxA	307-24-4	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFHpA	375-85-9	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFHxS	355-46-4	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFOA	335-67-1	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFNA	375-95-1	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFOS	1763-23-1	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFDA	335-76-2	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
MeFOSAA	2355-31-9	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
EtFOSAA	2991-50-6	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFUnA	2058-94-8	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFDoA	307-55-1	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFTrDA	72629-94-8	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
PFTeDA	376-06-7	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
HFPO-DA	13252-13-6	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
ADONA	919005-14-4	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
9Cl-PF3ONS	756426-58-1	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
11Cl-PF3OUdS	763051-92-9	ND	0.749	1.50	2.00		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	96.7	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
13C2-PFDA	SURR	87.4	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
d5-EtFOSAA	SURR	84.9	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1
13C3-HFPO-DA	SURR	89.8	70 - 130		B1J0067	13-Oct-21	0.250 L	19-Oct-21 03:11	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista 14
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW37-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 11:52

Laboratory Data

Lab Sample: 2110077-14
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFHxA	307-24-4	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFHpA	375-85-9	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFHxS	355-46-4	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFOA	335-67-1	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFNA	375-95-1	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFOS	1763-23-1	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFDA	335-76-2	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
MeFOSAA	2355-31-9	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
EtFOSAA	2991-50-6	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFUnA	2058-94-8	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFDoA	307-55-1	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFTrDA	72629-94-8	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
PFTeDA	376-06-7	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
HFPO-DA	13252-13-6	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
ADONA	919005-14-4	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
9Cl-PF3ONS	756426-58-1	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
11Cl-PF3OUdS	763051-92-9	ND	0.730	1.46	1.95		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
13C2-PFDA	SURR	88.4	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
d5-EtFOSAA	SURR	88.6	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1
13C3-HFPO-DA	SURR	92.0	70 - 130		B1J0067	13-Oct-21	0.257 L	19-Oct-21 03:22	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

AW 11/15/21

Vista 15
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB37-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 11:57

Laboratory Data

Lab Sample: 2110077-15
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFHxA	307-24-4	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFHpA	375-85-9	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFHxS	355-46-4	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFOA	335-67-1	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFNA	375-95-1	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFOS	1763-23-1	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFDA	335-76-2	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
MeFOSAA	2355-31-9	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
EtFOSAA	2991-50-6	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFUnA	2058-94-8	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFDoA	307-55-1	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFTrDA	72629-94-8	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
PFTeDA	376-06-7	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
HFPO-DA	13252-13-6	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
ADONA	919005-14-4	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
9Cl-PF3ONS	756426-58-1	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
11Cl-PF3OUdS	763051-92-9	ND	0.759	1.52	2.02		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	99.9	70 - 130		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
13C2-PFDA	SURR	84.2	70 - 130		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
d5-EtFOSAA	SURR	81.7	70 - 130		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1
13C3-HFPO-DA	SURR	84.4	70 - 130		B1J0067	13-Oct-21	0.247 L	19-Oct-21 03:34	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MW 11/15/21

Vista 16
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-RW19-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 13:11

Laboratory Data

Lab Sample: 2110077-16
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	60.0	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFHxA	307-24-4	58.5	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFHpA	375-85-9	29.1	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFHxS	355-46-4	247	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFOA	335-67-1	42.2	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFNA	375-95-1	2.57	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFOS	1763-23-1	95.6	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFDA	335-76-2	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
MeFOSAA	2355-31-9	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
EtFOSAA	2991-50-6	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFUnA	2058-94-8	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFDoA	307-55-1	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFTrDA	72629-94-8	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
PFTeDA	376-06-7	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
HFPO-DA	13252-13-6	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
ADONA	919005-14-4	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
9Cl-PF3ONS	756426-58-1	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
11Cl-PF3OUdS	763051-92-9	ND	0.734	1.47	1.96		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	112	70 - 130		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
13C2-PFDA	SURR	97.7	70 - 130		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
d5-EtFOSAA	SURR	101	70 - 130		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1
13C3-HFPO-DA	SURR	101	70 - 130		B1J0067	13-Oct-21	0.255 L	19-Oct-21 03:45	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

Vista 17
an Enthalpy Analytical Laboratory

Sample ID: WI-A06-FB19-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 13:16

Laboratory Data

Lab Sample: 2110077-17
Date Received: 08-Oct-21 09:46

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFHxA	307-24-4	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFHpA	375-85-9	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFHxS	355-46-4	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFOA	335-67-1	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFNA	375-95-1	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFOS	1763-23-1	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFDA	335-76-2	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
MeFOSAA	2355-31-9	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
EtFOSAA	2991-50-6	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFUnA	2058-94-8	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFDoA	307-55-1	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFTrDA	72629-94-8	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
PFTeDA	376-06-7	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
HFPO-DA	13252-13-6	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
ADONA	919005-14-4	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
9Cl-PF3ONS	756426-58-1	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
11Cl-PF3OUdS	763051-92-9	ND	0.747	1.49	1.99		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	91.1	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
13C2-PFDA	SURR	83.9	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
d5-EtFOSAA	SURR	79.4	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1
13C3-HFPO-DA	SURR	79.8	70 - 130		B1J0067	13-Oct-21	0.251 L	19-Oct-21 10:57	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL

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

11/15/21

Vista 18
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1RW24-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3

Matrix: Drinking Water
Date Collected: 07-Oct-21 09:27

Laboratory Data

Lab Sample: 2110077-18
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFHxA	307-24-4	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFHpA	375-85-9	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFHxS	355-46-4	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFOA	335-67-1	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFNA	375-95-1	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFOS	1763-23-1	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFDA	335-76-2	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
MeFOSAA	2355-31-9	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
EtFOSAA	2991-50-6	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFUnA	2058-94-8	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFDoA	307-55-1	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFTrDA	72629-94-8	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
PFTeDA	376-06-7	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
HFPO-DA	13252-13-6	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
ADONA	919005-14-4	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
9Cl-PF3ONS	756426-58-1	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
11Cl-PF3OUdS	763051-92-9	ND	0.732	1.46	1.95		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	125	70 - 130		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
13C2-PFDA	SURR	109	70 - 130		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
d5-EtFOSAA	SURR	98.6	70 - 130		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1
13C3-HFPO-DA	SURR	112	70 - 130		B1J0067	13-Oct-21	0.256 L	19-Oct-21 04:07	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista an Enthalpy Analytical Laboratory 19

Sample ID: WI-CV-1FB24-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Matrix: Drinking Water
Date Collected: 07-Oct-21 09:32

Laboratory Data

Lab Sample: 2110077-19
Date Received: 08-Oct-21 09:46
Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFHxA	307-24-4	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFHpA	375-85-9	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFHxS	355-46-4	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFOA	335-67-1	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFNA	375-95-1	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFOS	1763-23-1	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFDA	335-76-2	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
MeFOSAA	2355-31-9	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
EtFOSAA	2991-50-6	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFUnA	2058-94-8	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFDoA	307-55-1	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFTrDA	72629-94-8	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
PFTeDA	376-06-7	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
HFPO-DA	13252-13-6	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
ADONA	919005-14-4	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
9Cl-PF3ONS	756426-58-1	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
11Cl-PF3OUdS	763051-92-9	ND	0.754	1.51	2.01		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	123	70 - 130		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
13C2-PFDA	SURR	108	70 - 130		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
d5-EtFOSAA	SURR	106	70 - 130		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1
13C3-HFPO-DA	SURR	113	70 - 130		B1J0067	13-Oct-21	0.249 L	19-Oct-21 04:18	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL

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

MW 11/15/21

ENVIRONMENTAL
Data Services, Inc.

DATA VALIDATION SUMMARY REPORT
NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon
SDG: 2110098
Laboratory: Vista Analytical Laboratory, El Dorado Hills, California
Site: NAS Whidbey Island, Residential Wells, CTO-4470, Washington
Date: November 15, 2021

PFAS			
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-3RW04-1021	2110098-01	Water
1MS	WI-CV-3RW04-1021MS	2110098-01MS	Water
1MSD	WI-CV-3RW04-1021MSD	2110098-01MSD	Water
2	WI-CV-3FB04-1021	2110098-02	Water
3	WI-CV-2RW02-1021	2110098-03	Water
4	WI-CV-2FB02-1021	2110098-04	Water
5	WI-CV-1RW72-1021	2110098-05	Water
6	WI-CV-1FB72-1021	2110098-06	Water

A full data validation was performed on the analytical data for three water samples and three aqueous field blank samples collected on October 8, 2020 by CH2M Hill at the NAS Whidbey Island site in Washington. The samples were analyzed under the EPA Method "Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS)".

Specific method references are as follows:

Analysis	*Method References*
PFAS	USEPA Method 537.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method, the Final Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water Ault Field, Area 6, and Outlying Landing Field Coupeville, Naval Air Station Whidbey Island, April 2020, the DoD Final General Data Validation Guidelines, November 2019, and the USEPA Data Review and Validation Guidelines as follows:

- The USEPA "Data Review and Validation Guidelines for Perfluoroalkyl Substances (PFASs) Analyzed Using EPA Method 537," November 2018;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Date Completeness, Case Narrative & Custody Documentation
- Holding times
- Liquid Chromatography/Mass Spectrometry (LC/MS) Tuning
- Initial and continuing calibration summaries
- Method blank and field QC blank contamination
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD) recoveries
- Internal standard area and retention time summary forms
- Target Compound Identification
- Compound Quantitation
- Field Duplicate sample precision

A full (Stage 2B/4) data validation was performed with this review including a recalculation of 100% of the detected results in the samples.

Data Usability Assessment

There were no serious deficiencies of data.

The data are acceptable for the intended purposes. There were no qualifications.

Perfluorinated Alkyl Substances (PFAS)

Data Completeness, Case Narrative & Custody Documentation

- The case narrative and chain-of-custody documentation were included in the data package as required. All criteria were met.

Holding Times

- All samples were extracted within 14 days for water samples and analyzed within 28 days.

LC/MS Tuning

- All criteria were met.

Initial Calibration

- All relative standard deviation (%RSD) and/or correlation coefficients criteria were met.

Continuing Calibration

- All percent difference (%D) and RRF criteria were met.

Method Blank

- The method blanks were free of contamination.

Field QC Blank

- Field QC sample results are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-3FB04-1021	None - ND	-	-	-
WI-CV-2FB02-1021	None - ND	-	-	-
WI-CV-1FB72-1021	None - ND	-	-	-

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate percent recoveries (%R).

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- The MS/MSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Laboratory Control Samples (LCS)

- The LCS samples exhibited acceptable percent recoveries (%R).

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Target Compound Identification

- All mass spectra and quantitation criteria were met.

Compound Quantitation

- All criteria were met.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Please contact the undersigned at (561) 475-2000 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 11/17/21

Nancy Weaver
Senior Chemist

Qualifier	Definition
U	The analyte was not detected and was reported as less than the LOD or as defined by the customer. The LOD has been adjusted for any dilution or concentration of the sample.
J	The reported result was an estimated value with an unknown bias.
J+	The result was an estimated quantity, but the result may be biased high.
J-	The result was an estimated quantity, but the result may be biased low.
N	The analysis indicates the presence of an analyte for which there was presumptive evidence to make a "tentative identification."
NJ	The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value was the estimated concentration in the sample.
UJ	The analyte was not detected and was reported as less than the LOD or as defined by the customer. However, the associated numerical value is approximate.
X	The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided. Acceptance or rejection of the data should be decided by the project team (which should include a project chemist), but exclusion of the data is recommended.

Vista
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-3RW04-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: CV-3RW04

Matrix: Drinking Water
Date Collected: 08-Oct-21 08:20

Laboratory Data

Lab Sample: 2110098-01
Date Received: 12-Oct-21 10:34

Column:

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFHxA	307-24-4	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFHpA	375-85-9	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFHxS	355-46-4	3.11	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFOA	335-67-1	2.16	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFNA	375-95-1	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFOS	1763-23-1	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFDA	335-76-2	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
MeFOSAA	2355-31-9	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
EtFOSAA	2991-50-6	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFUnA	2058-94-8	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFDoA	307-55-1	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFTrDA	72629-94-8	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
PFTeDA	376-06-7	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
HFPO-DA	13252-13-6	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
ADONA	919005-14-4	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
9Cl-PF3ONS	756426-58-1	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
11Cl-PF3OUdS	763051-92-9	ND	0.713	1.43	1.90		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	92.6	70 - 130		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
13C2-PFDA	SURR	88.9	70 - 130		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
d5-EtFOSAA	SURR	97.3	70 - 130		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1
13C3-HFPO-DA	SURR	82.8	70 - 130		B1J0085	14-Oct-21	0.263 L	19-Oct-21 15:50	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

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Vista 2
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-3FB04-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: CV-3RW04

Matrix: Drinking Water
Date Collected: 08-Oct-21 08:25

Laboratory Data

Lab Sample: 2110098-02
Date Received: 12-Oct-21 10:34

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFHxA	307-24-4	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFHpA	375-85-9	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFHxS	355-46-4	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFOA	335-67-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFNA	375-95-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFOS	1763-23-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFDA	335-76-2	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
MeFOSAA	2355-31-9	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
EtFOSAA	2991-50-6	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFUnA	2058-94-8	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFDoA	307-55-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFTrDA	72629-94-8	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
PFTeDA	376-06-7	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
HFPO-DA	13252-13-6	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
ADONA	919005-14-4	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
9Cl-PF3ONS	756426-58-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
11Cl-PF3OUdS	763051-92-9	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	99.5	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
13C2-PFDA	SURR	91.3	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
d5-EtFOSAA	SURR	90.1	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1
13C3-HFPO-DA	SURR	81.8	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 16:01	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Vista 3
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Sample ID: WI-CV-2RW02-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: CV-2RW02

Matrix: Drinking Water
Date Collected: 08-Oct-21 09:11

Laboratory Data

Lab Sample: 2110098-03
Date Received: 12-Oct-21 10:34

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	32.3	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFHxA	307-24-4	76.2	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFHpA	375-85-9	19.1	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFHxS	355-46-4	83.5	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFOA	335-67-1	363	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFNA	375-95-1	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFOS	1763-23-1	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFDA	335-76-2	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
MeFOSAA	2355-31-9	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
EtFOSAA	2991-50-6	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFUnA	2058-94-8	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFDoA	307-55-1	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFTrDA	72629-94-8	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
PFTeDA	376-06-7	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
HFPO-DA	13252-13-6	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
ADONA	919005-14-4	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
9Cl-PF3ONS	756426-58-1	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
11Cl-PF3OUdS	763051-92-9	ND	0.721	1.44	1.92		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95.9	70 - 130		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
13C2-PFDA	SURR	86.0	70 - 130		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
d5-EtFOSAA	SURR	79.3	70 - 130		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1
13C3-HFPO-DA	SURR	82.9	70 - 130		B1J0085	14-Oct-21	0.260 L	19-Oct-21 16:12	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

NW 11/15/21

Vista
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4

Sample ID: WI-CV-2FB02-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: CV-2RW02

Matrix: Drinking Water
Date Collected: 08-Oct-21 09:16

Laboratory Data

Lab Sample: 2110098-04
Date Received: 12-Oct-21 10:34

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFHxA	307-24-4	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFHpA	375-85-9	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFHxS	355-46-4	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFOA	335-67-1	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFNA	375-95-1	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFOS	1763-23-1	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFDA	335-76-2	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
MeFOSAA	2355-31-9	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
EtFOSAA	2991-50-6	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFUnA	2058-94-8	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFDoA	307-55-1	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFTrDA	72629-94-8	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
PFTeDA	376-06-7	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
HFPO-DA	13252-13-6	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
ADONA	919005-14-4	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
9Cl-PF3ONS	756426-58-1	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
11Cl-PF3OUdS	763051-92-9	ND	0.744	1.49	1.98		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.6	70 - 130		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
13C2-PFDA	SURR	93.3	70 - 130		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
d5-EtFOSAA	SURR	86.8	70 - 130		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1
13C3-HFPO-DA	SURR	85.4	70 - 130		B1J0085	14-Oct-21	0.252 L	19-Oct-21 16:23	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

MS 11/15/21

Vista 5
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Sample ID: WI-CV-1RW72-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: CV-1RW72

Matrix: Drinking Water
Date Collected: 08-Oct-21 10:02

Laboratory Data

Lab Sample: 2110098-05
Date Received: 12-Oct-21 10:34

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	1.79	0.711	1.42	1.90	J	B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFHxA	307-24-4	1.66	0.711	1.42	1.90	J	B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFHpA	375-85-9	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFHxS	355-46-4	1.05	0.711	1.42	1.90	J	B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFOA	335-67-1	0.879	0.711	1.42	1.90	J	B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFNA	375-95-1	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFOS	1763-23-1	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFDA	335-76-2	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
MeFOSAA	2355-31-9	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
EtFOSAA	2991-50-6	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFUnA	2058-94-8	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFDoA	307-55-1	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFTrDA	72629-94-8	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
PFTeDA	376-06-7	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
HFPO-DA	13252-13-6	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
ADONA	919005-14-4	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
9Cl-PF3ONS	756426-58-1	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
11Cl-PF3OUdS	763051-92-9	ND	0.711	1.42	1.90		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	93.1	70 - 130		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
13C2-PFDA	SURR	81.9	70 - 130		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
d5-EtFOSAA	SURR	80.9	70 - 130		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1
13C3-HFPO-DA	SURR	76.9	70 - 130		B1J0085	14-Oct-21	0.264 L	19-Oct-21 16:35	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

Mw 11/5/21

Vista 6
an Enthalpy Analytical Laboratory

Sample ID: WI-CV-1FB72-1021

EPA Method 537.1

Client Data

Name: CH2M Hill
Project: 9000NVT3
Location: CV-1RW72

Matrix: Drinking Water
Date Collected: 08-Oct-21 10:07

Laboratory Data

Lab Sample: 2110098-06
Date Received: 12-Oct-21 10:34

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFHxA	307-24-4	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFHpA	375-85-9	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFHxS	355-46-4	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFOA	335-67-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFNA	375-95-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFOS	1763-23-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFDA	335-76-2	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
MeFOSAA	2355-31-9	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
EtFOSAA	2991-50-6	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFUnA	2058-94-8	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFDoA	307-55-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFTrDA	72629-94-8	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
PFTeDA	376-06-7	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
HFPO-DA	13252-13-6	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
ADONA	919005-14-4	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
9Cl-PF3ONS	756426-58-1	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
11Cl-PF3OUdS	763051-92-9	ND	0.758	1.52	2.02		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	106	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
13C2-PFDA	SURR	92.2	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
d5-EtFOSAA	SURR	93.0	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1
13C3-HFPO-DA	SURR	97.1	70 - 130		B1J0085	14-Oct-21	0.247 L	19-Oct-21 08:10	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

11/15/21

Attachment 4
Trend Graphs

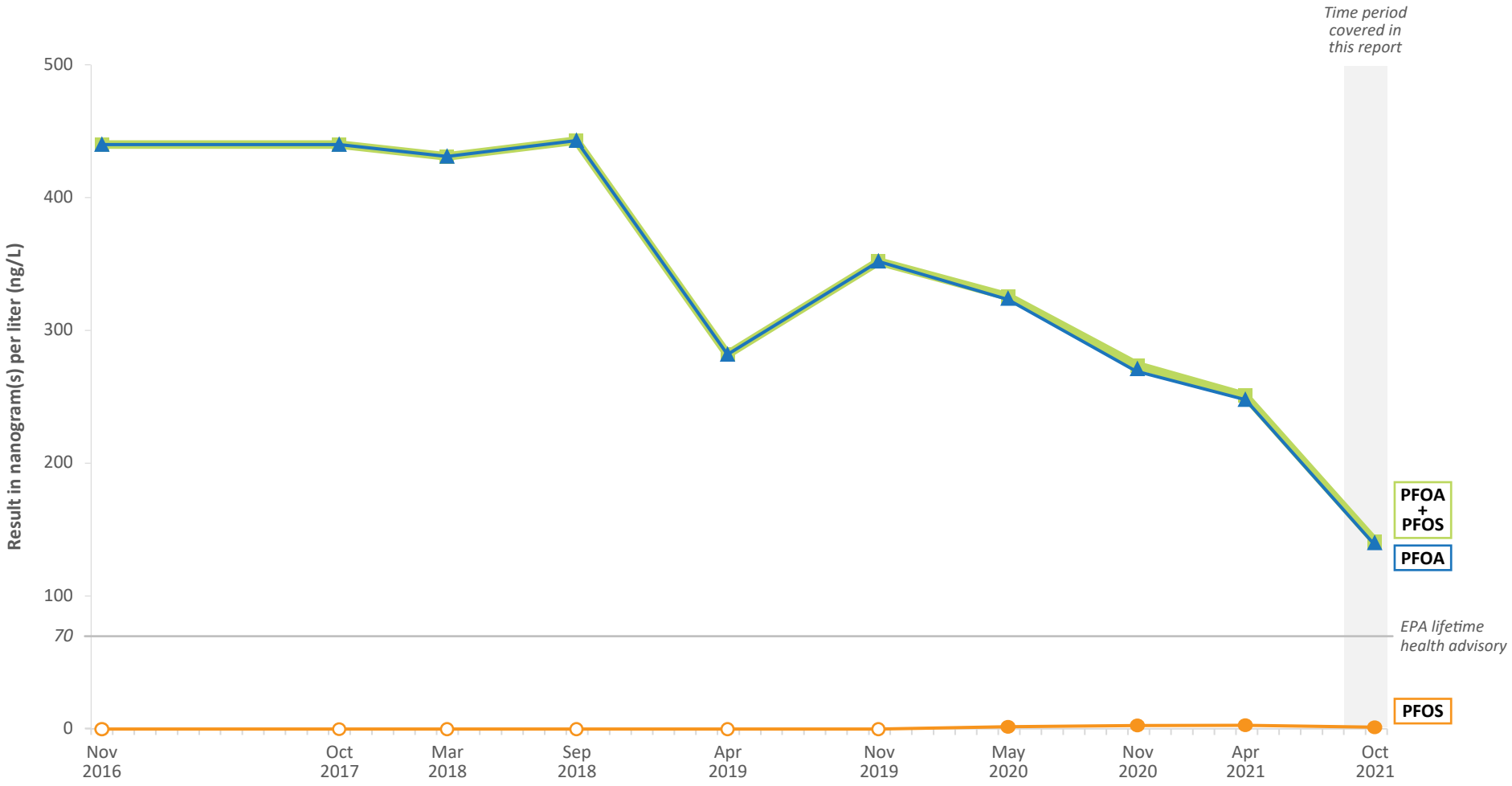


Figure A4-1.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW01
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

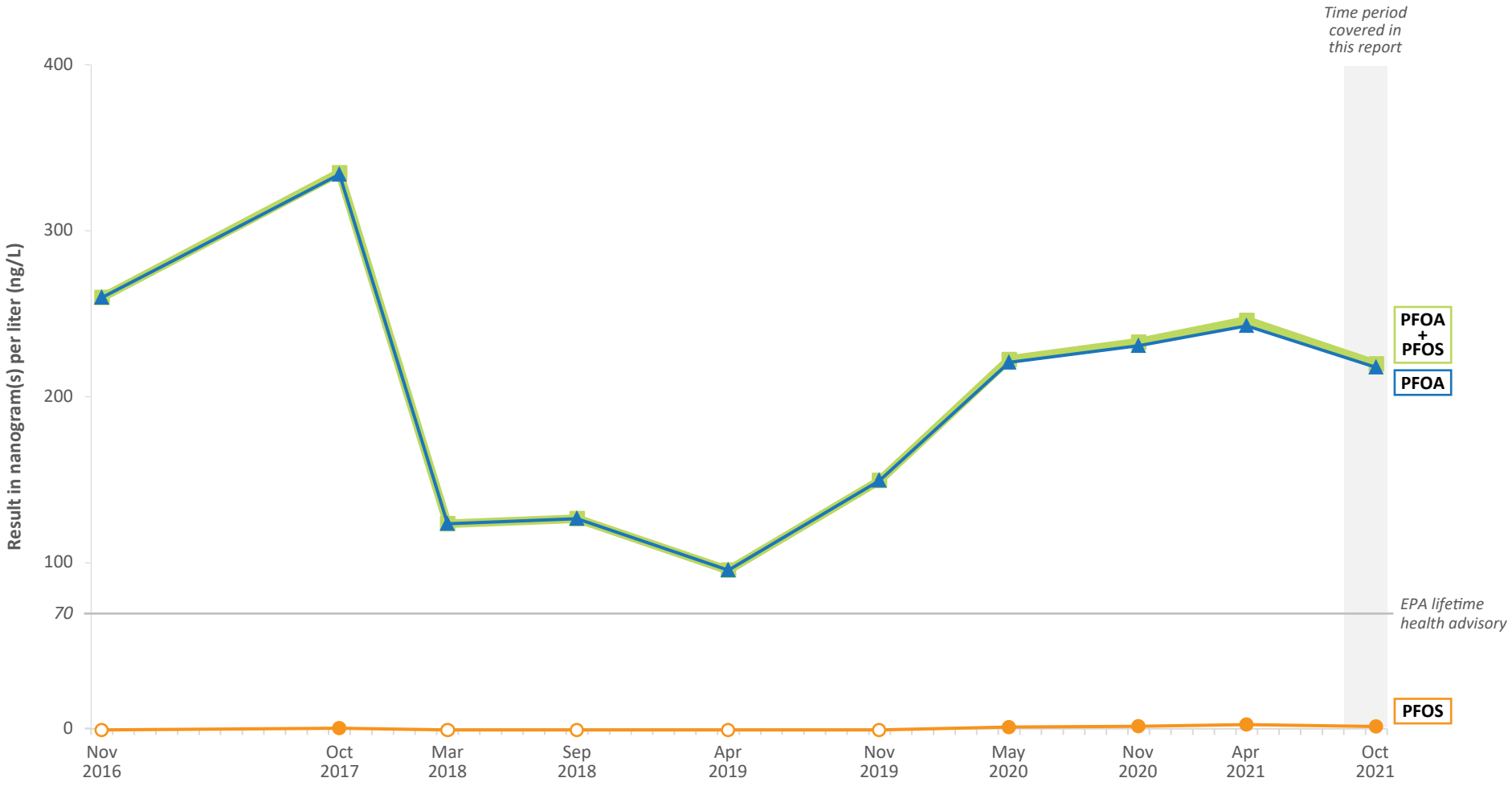


Figure A4-2.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW07
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

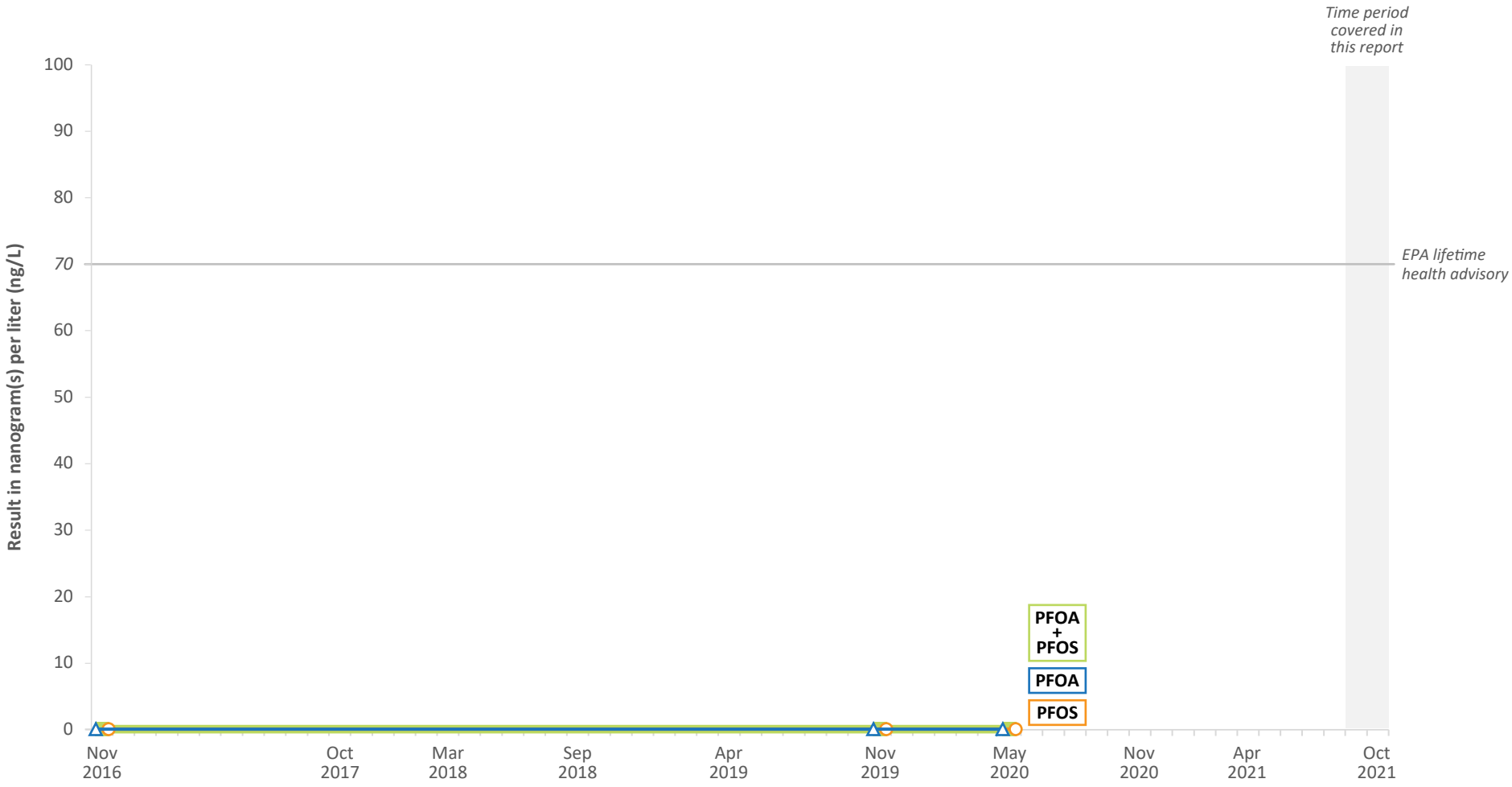


Figure A4-3.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW09
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

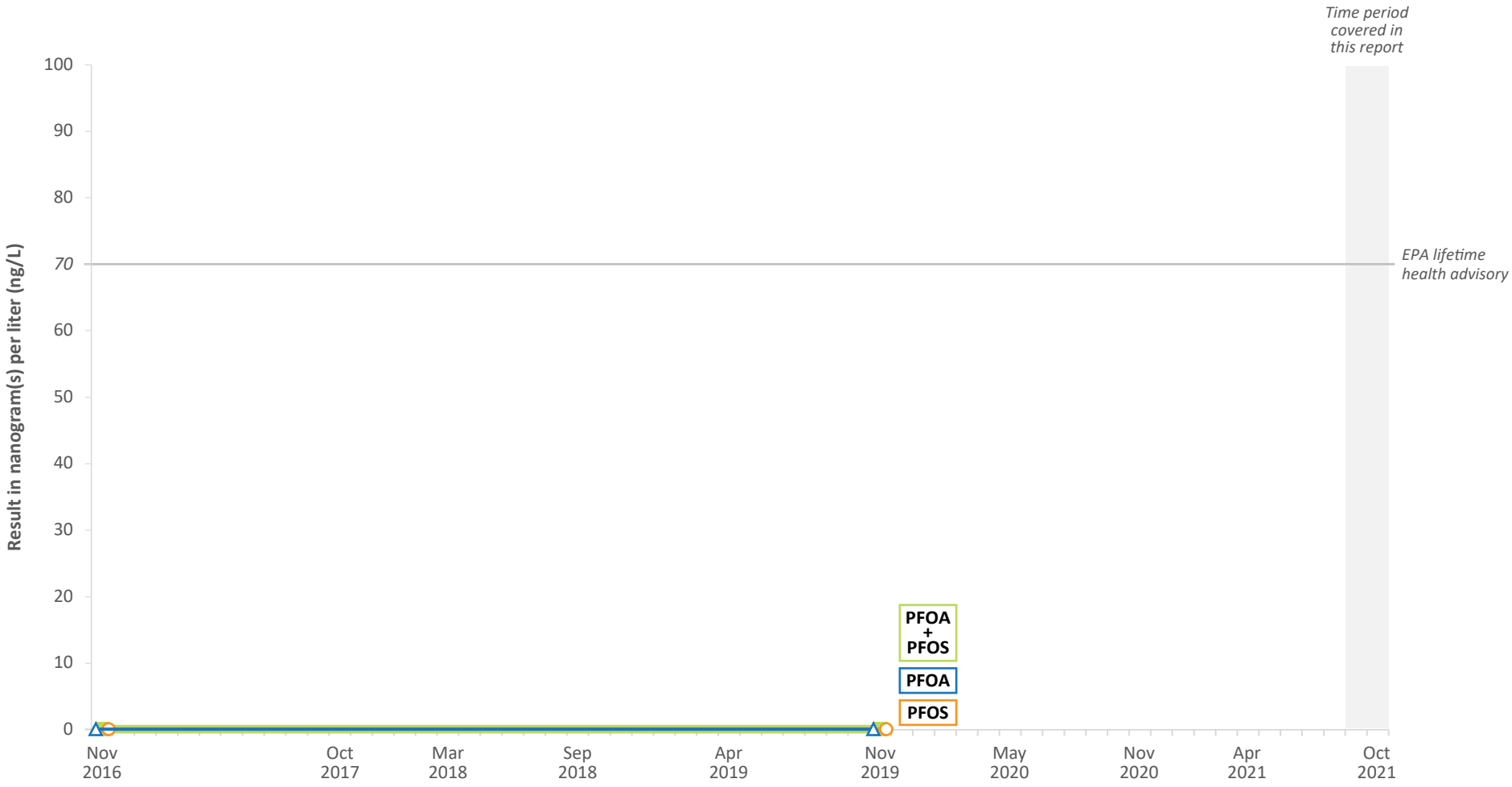


Figure A4-4.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW10
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

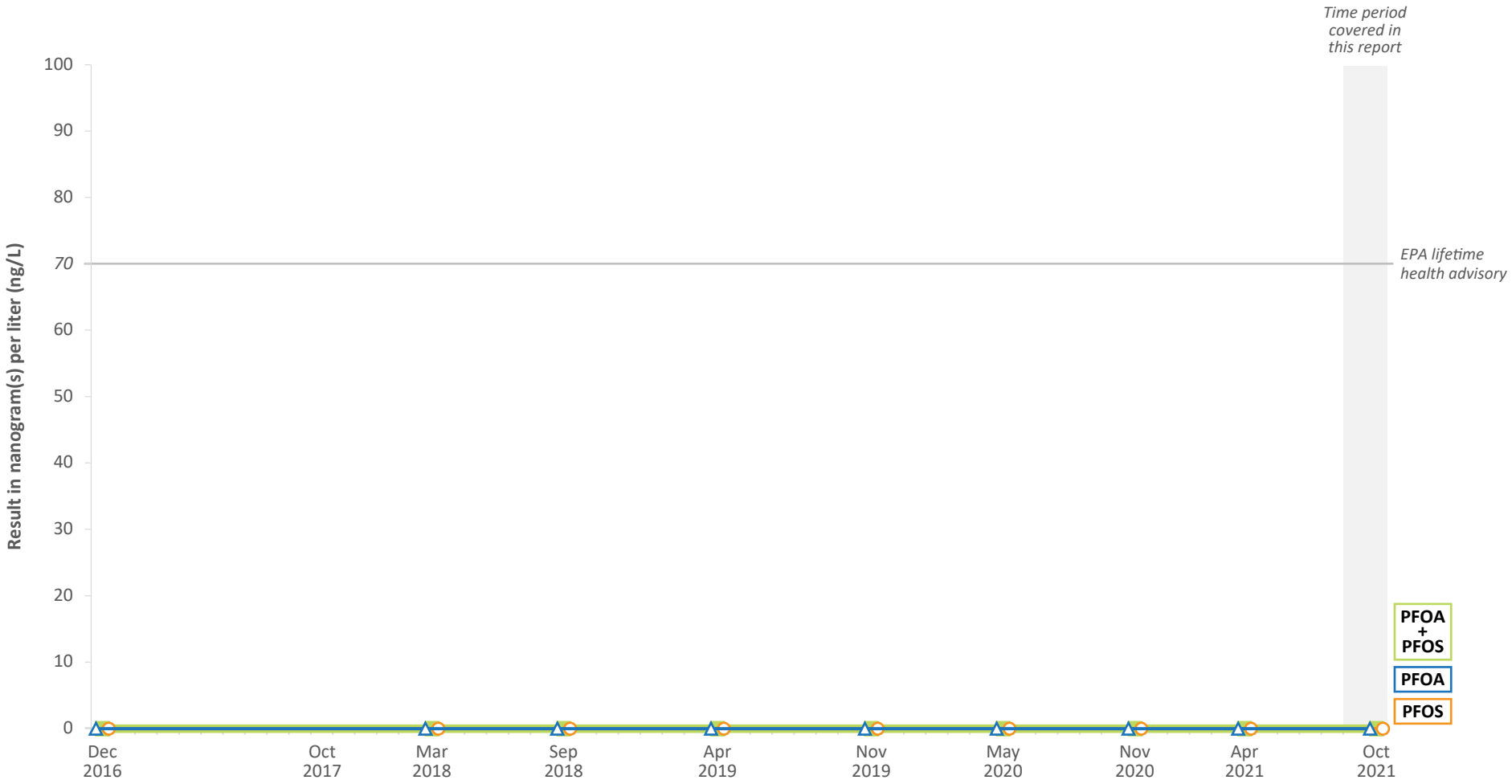


Figure A4-5.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW14
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

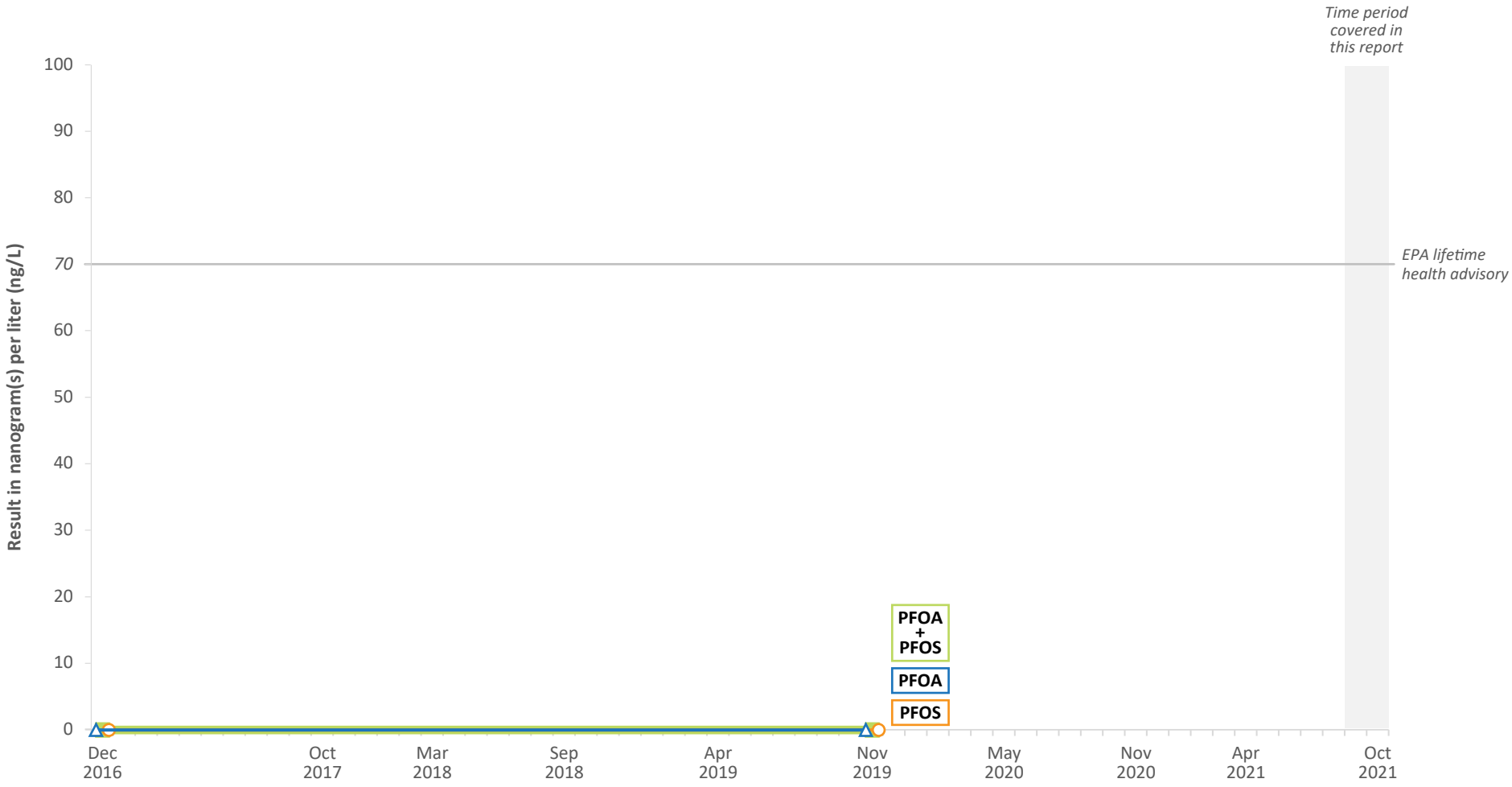


Figure A4-6.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW20
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

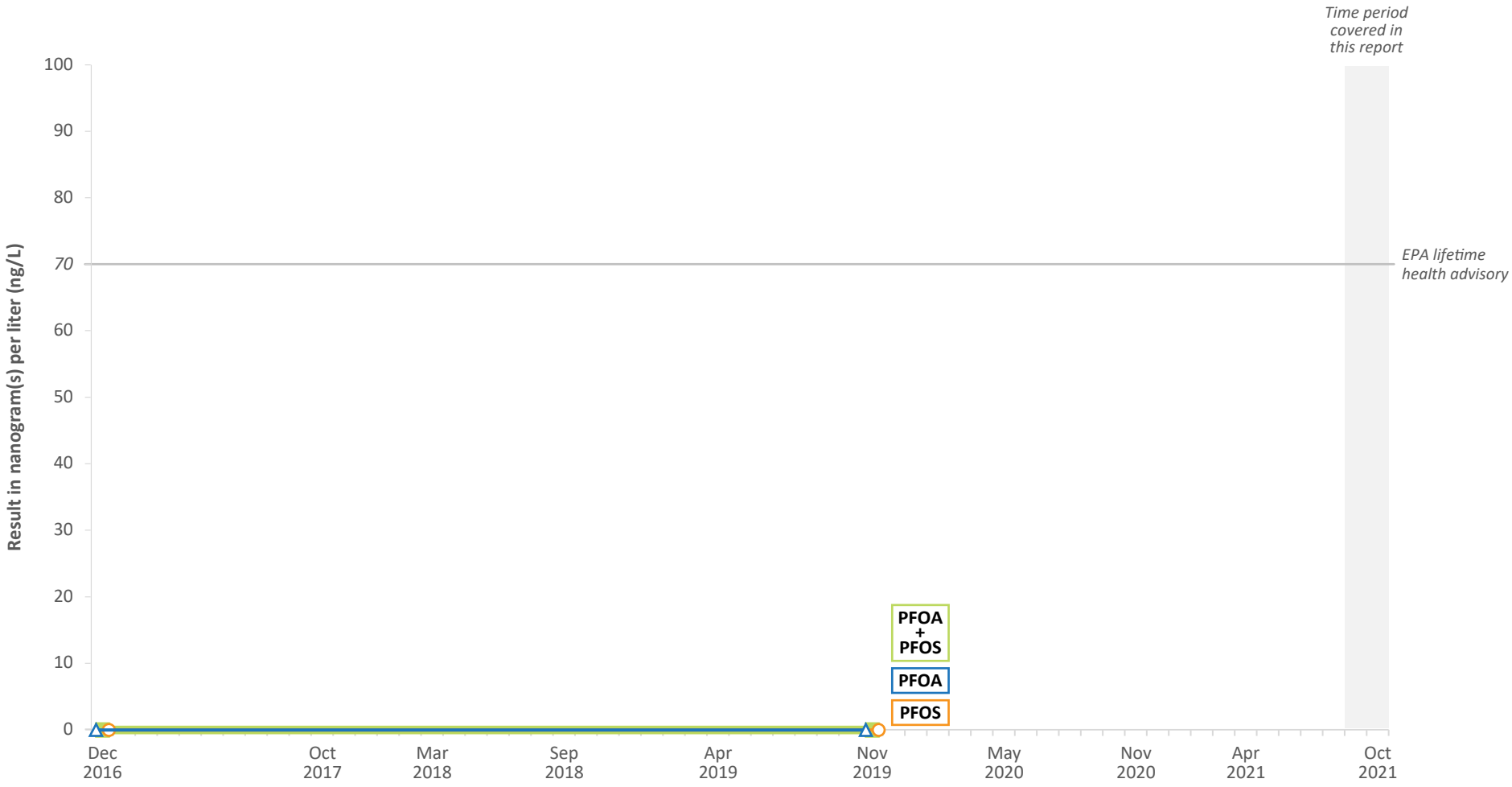


Figure A4-7.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW21
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

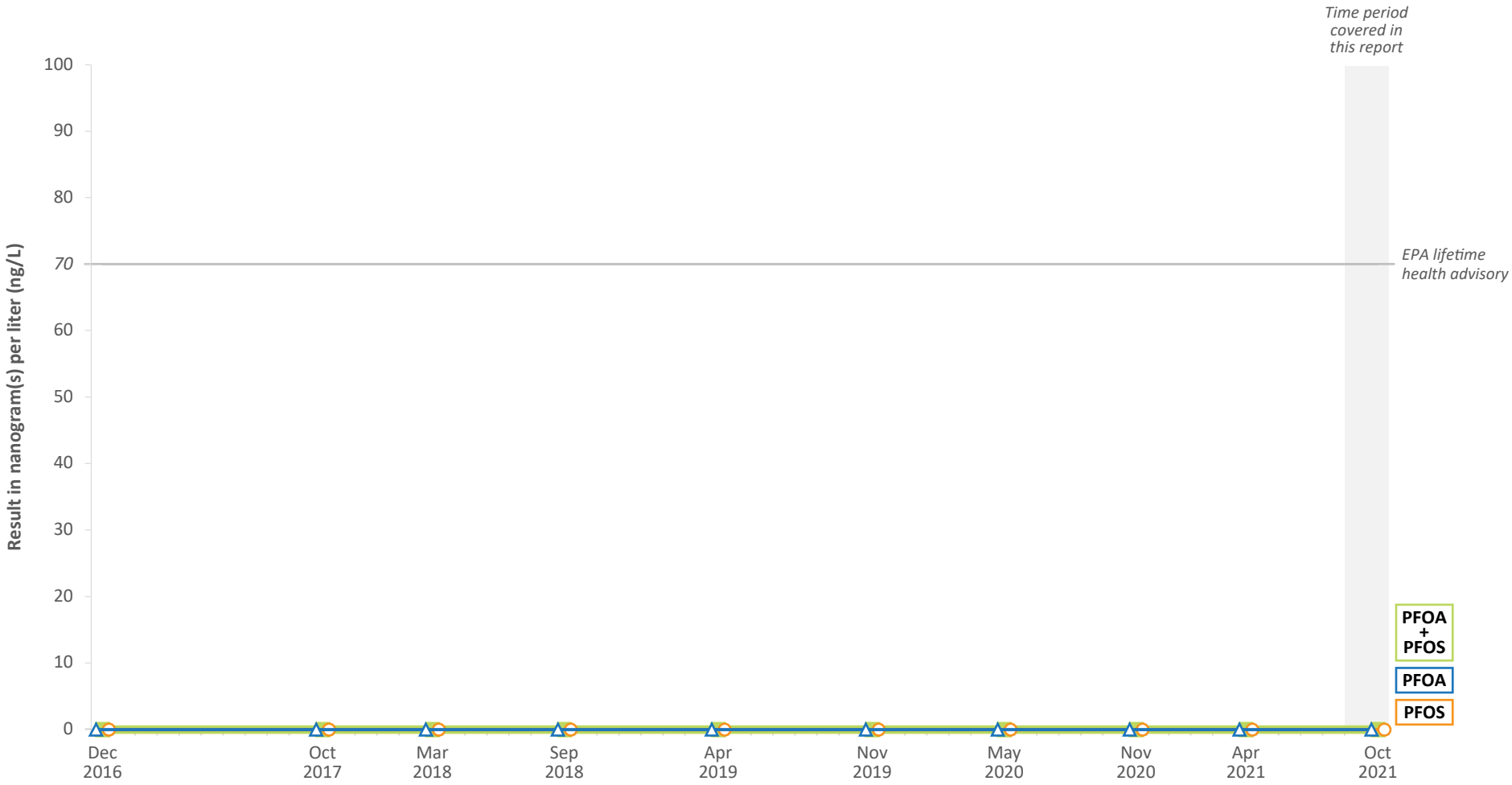


Figure A4-8.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW22
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

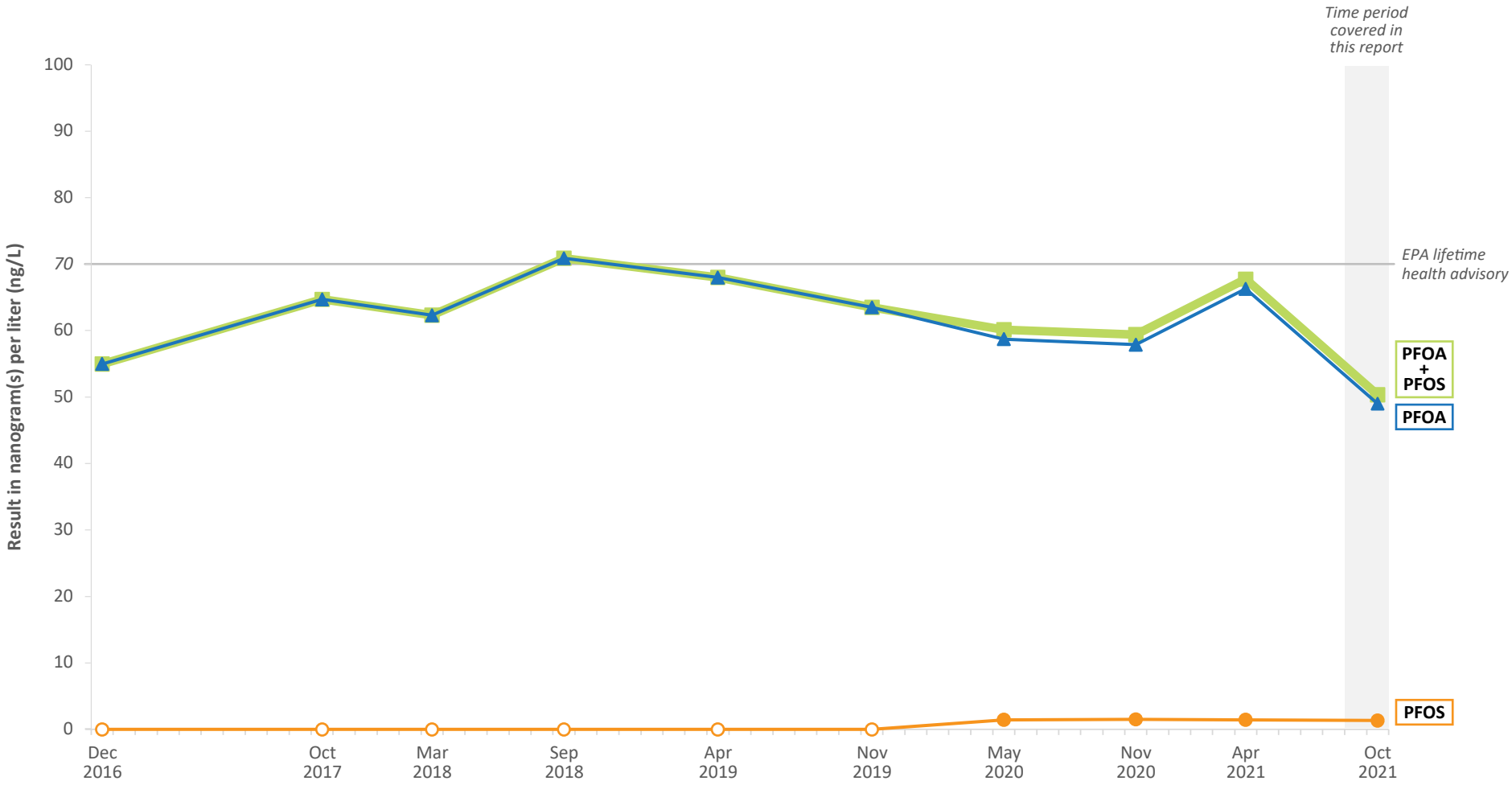


Figure A4-9.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW23
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

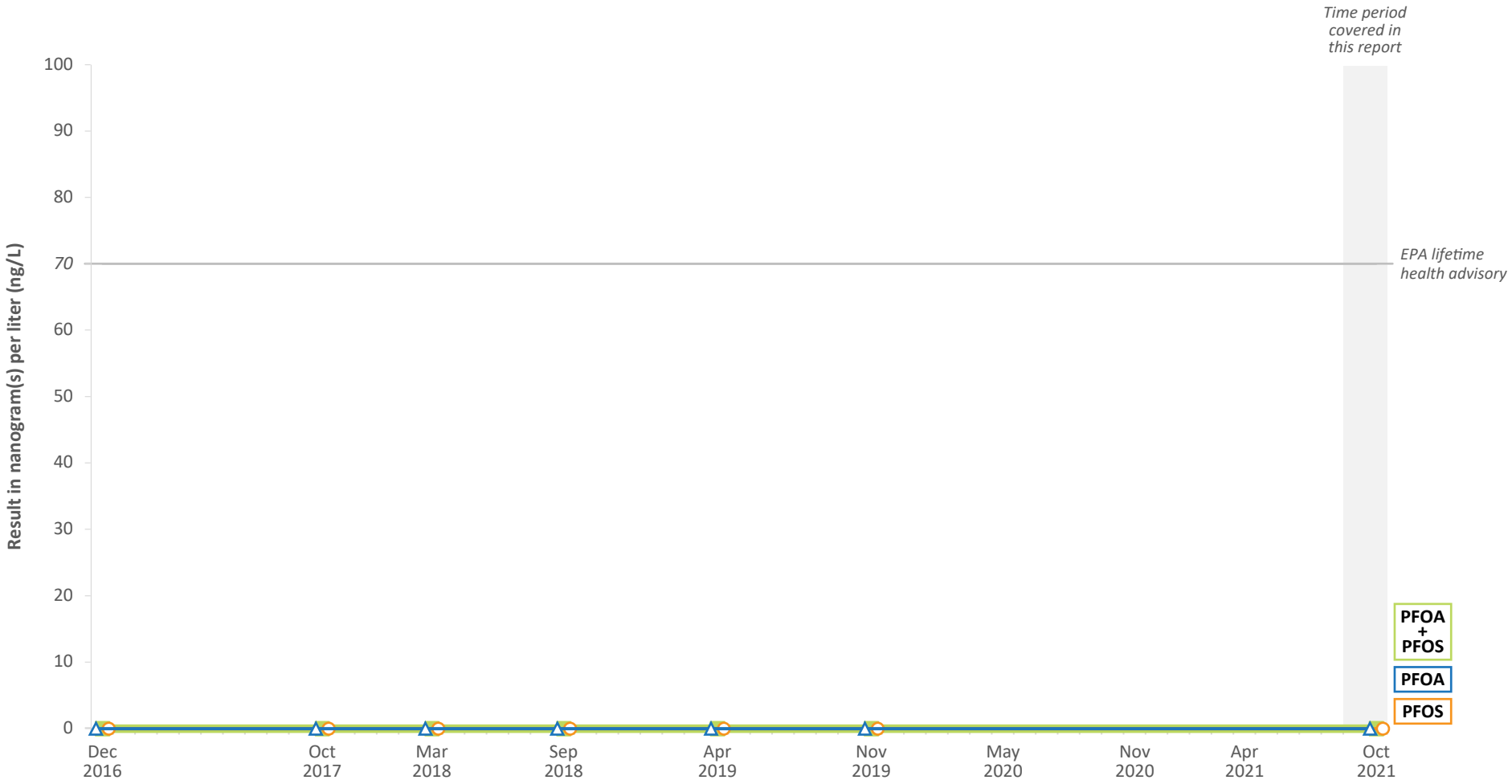


Figure A4-10.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW24
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

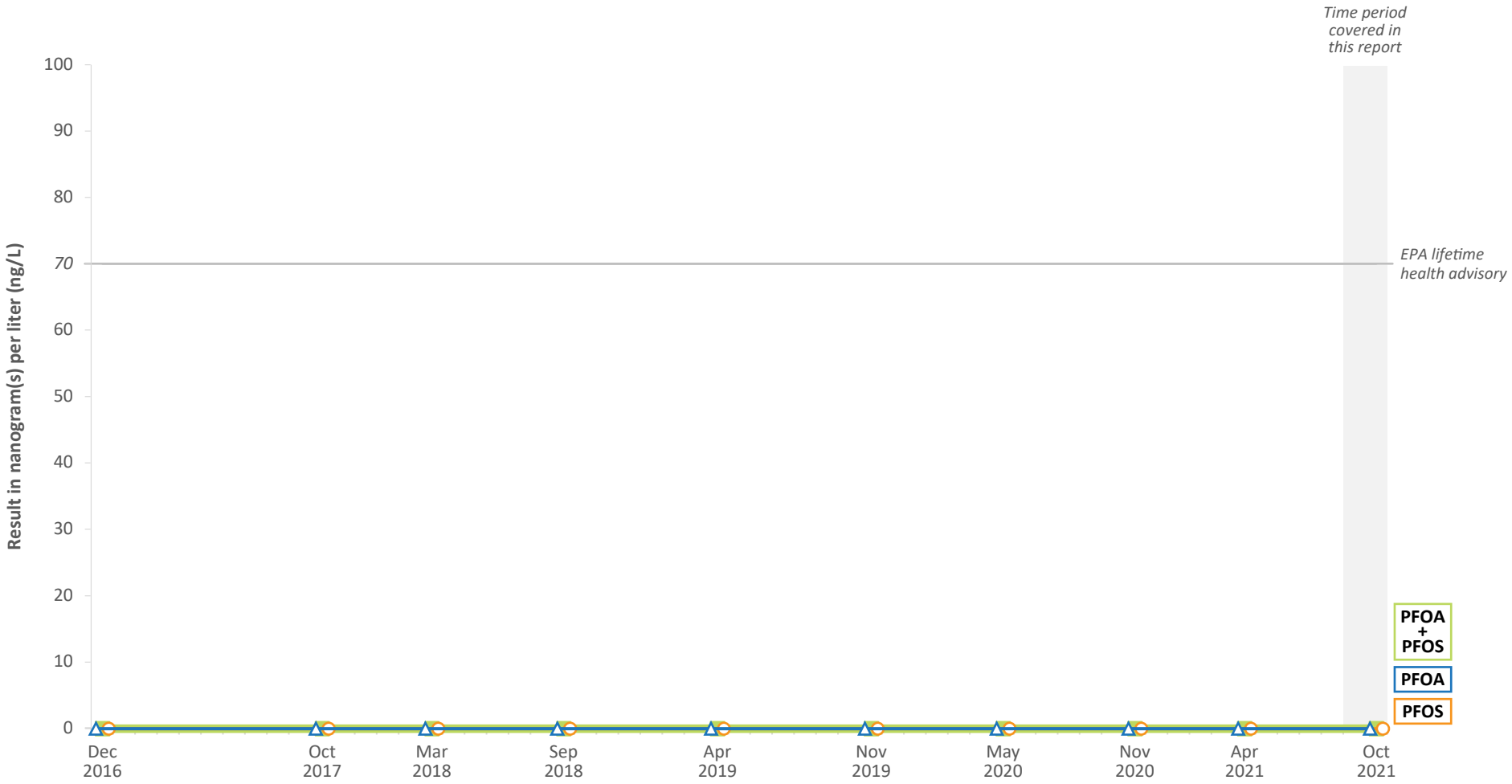


Figure A4-11.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW25
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

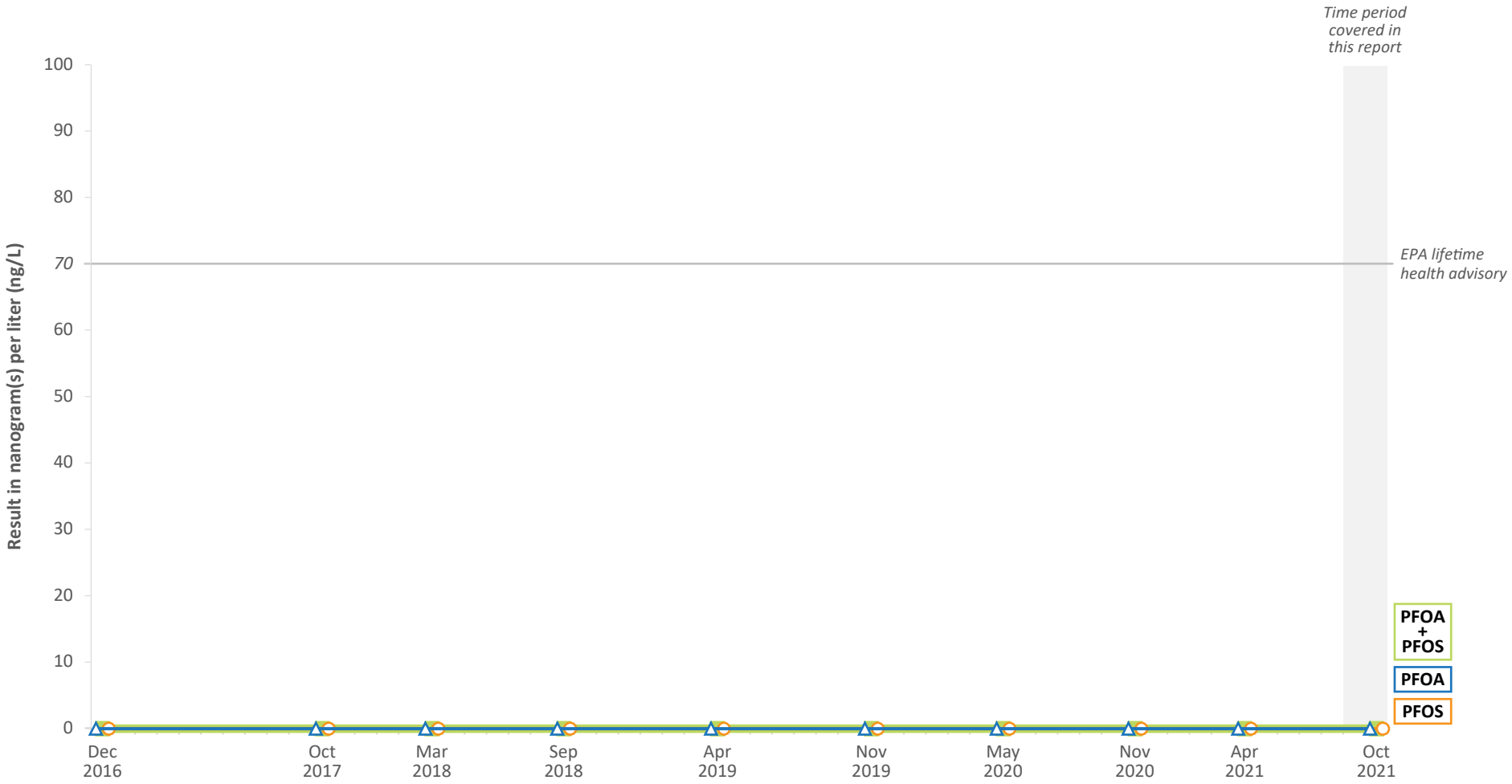


Figure A4-12.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW26
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

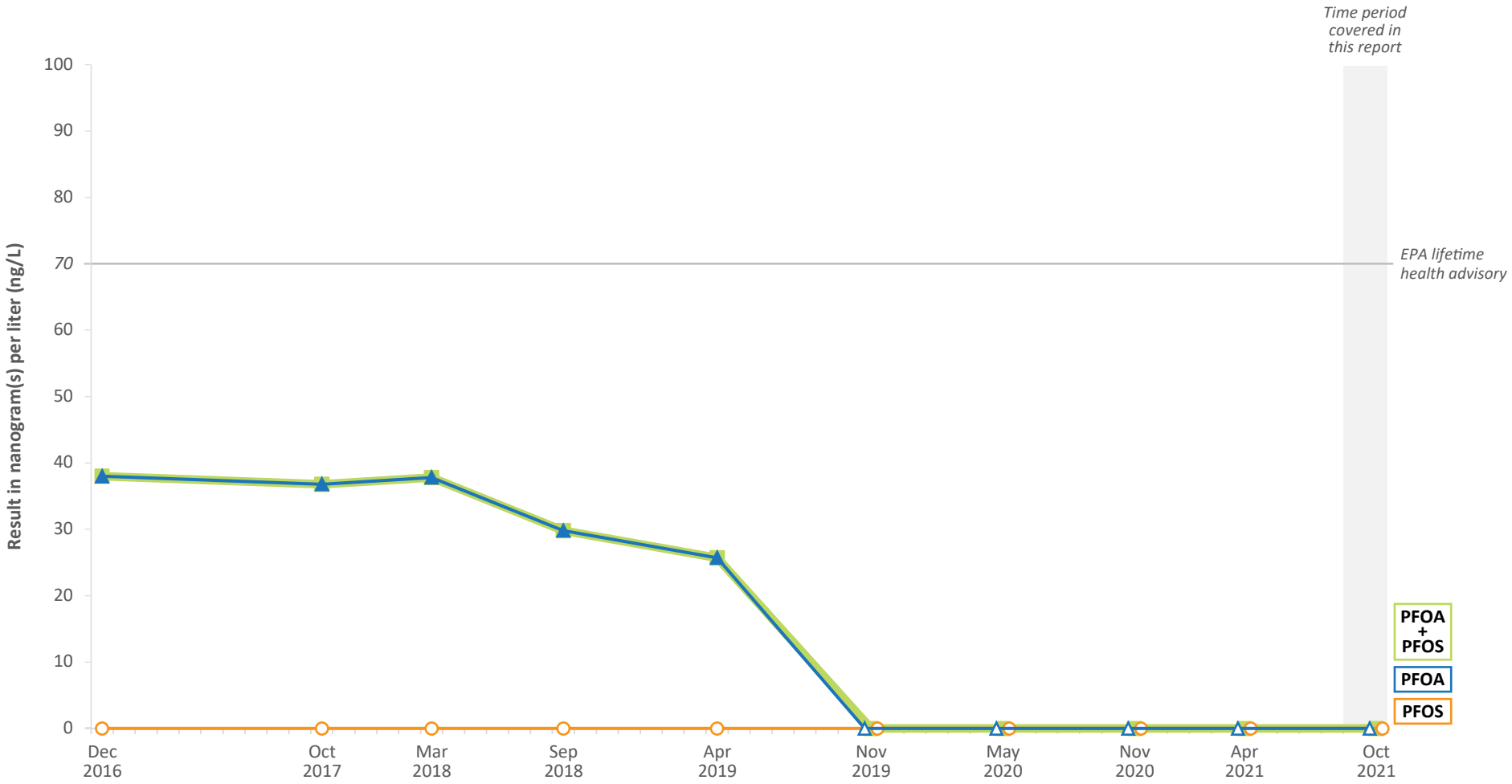


Figure A4-13.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW27
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

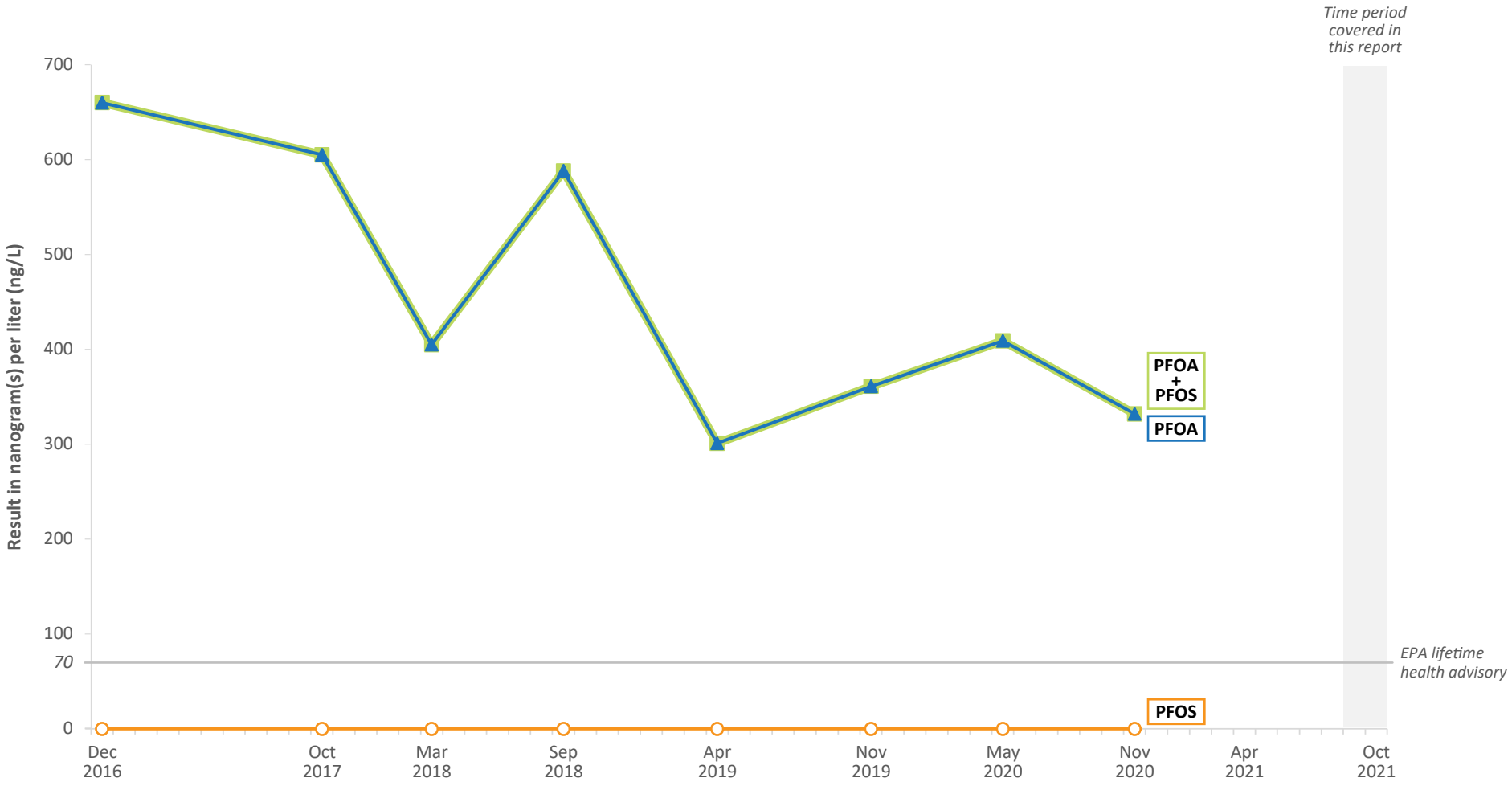


Figure A4-14.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW34
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

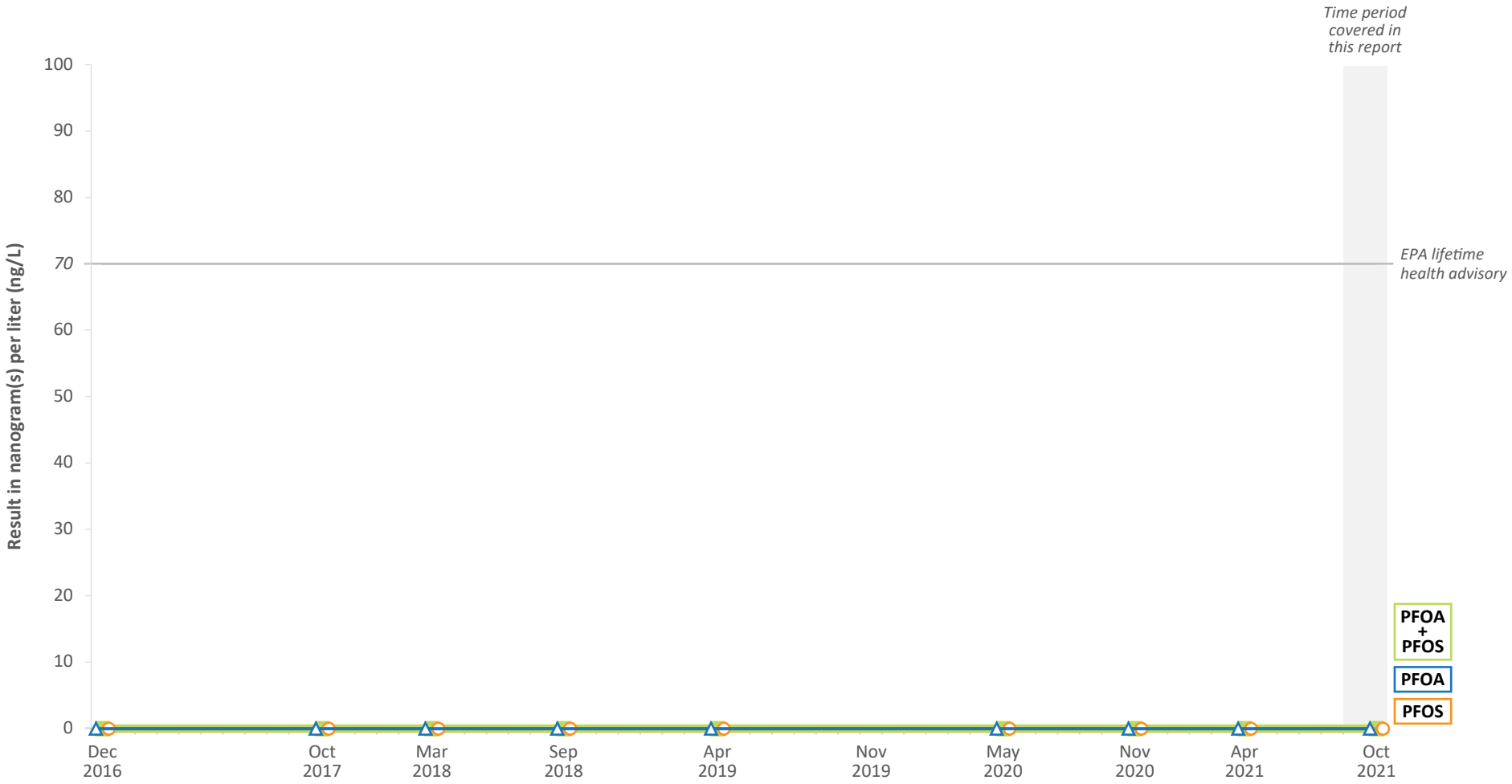


Figure A4-15.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW37
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

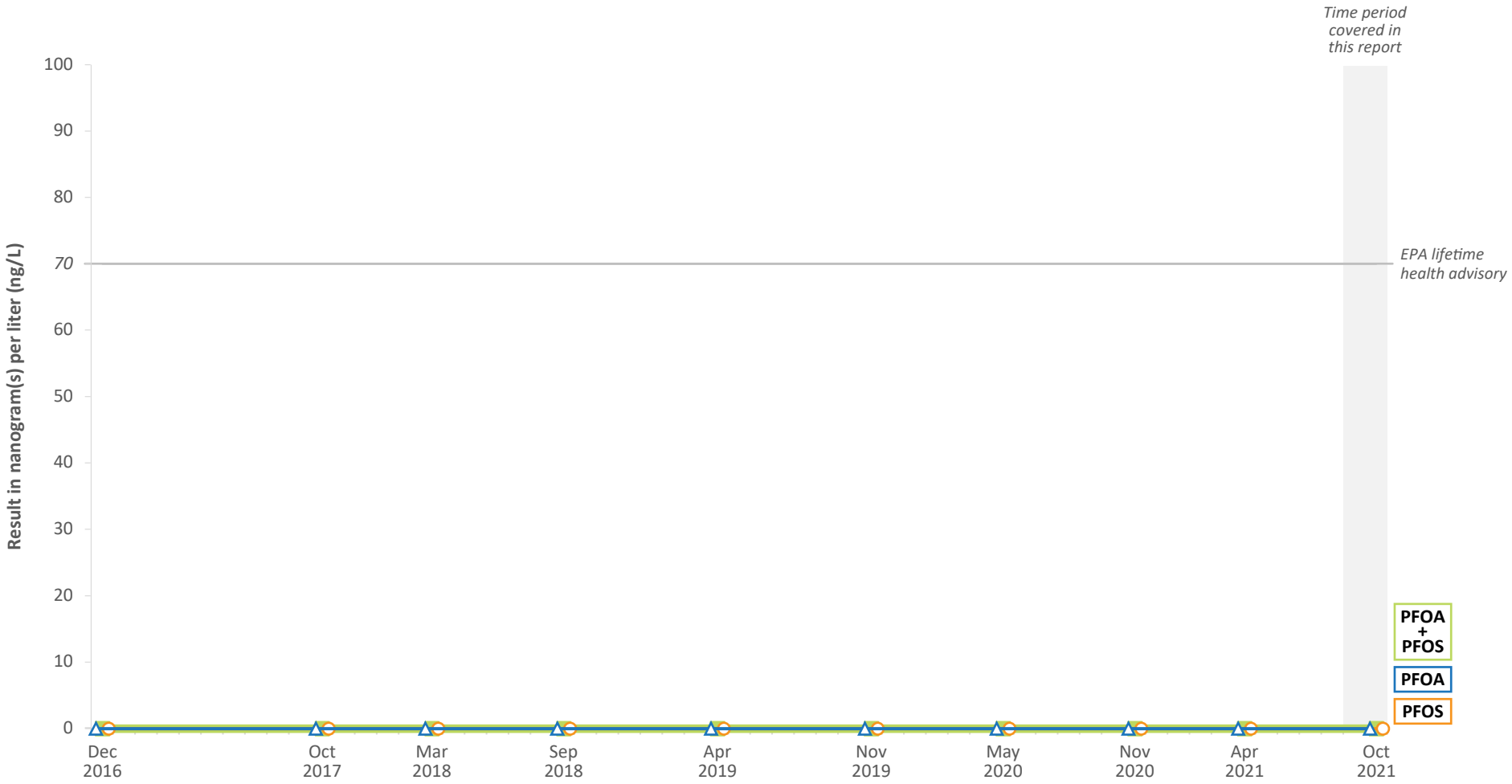


Figure A4-16.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW40
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

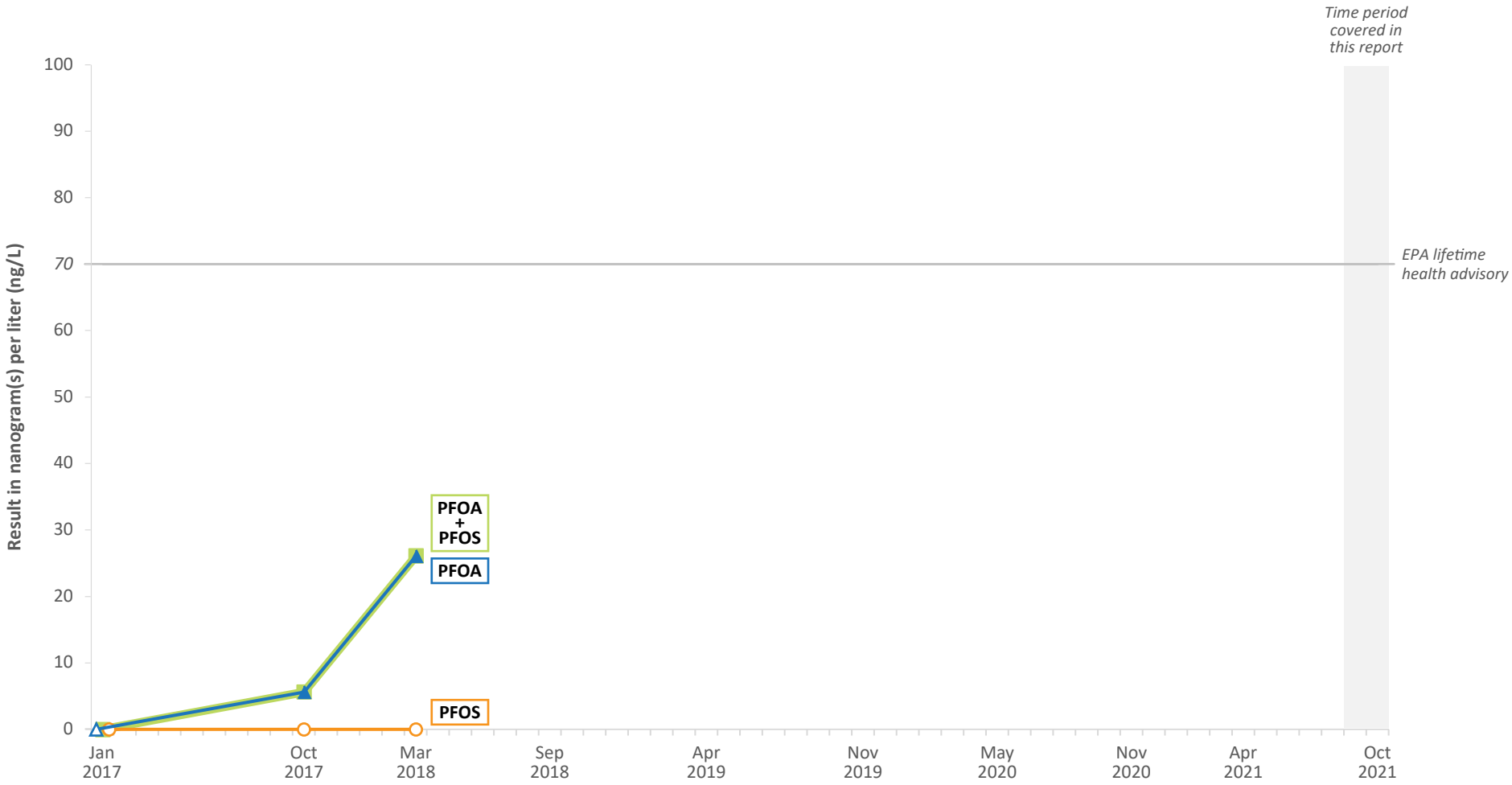


Figure A4-17.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW60
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The WI-CV-1RW60 well sampling location was taken off-line after the March 2018 sampling event.

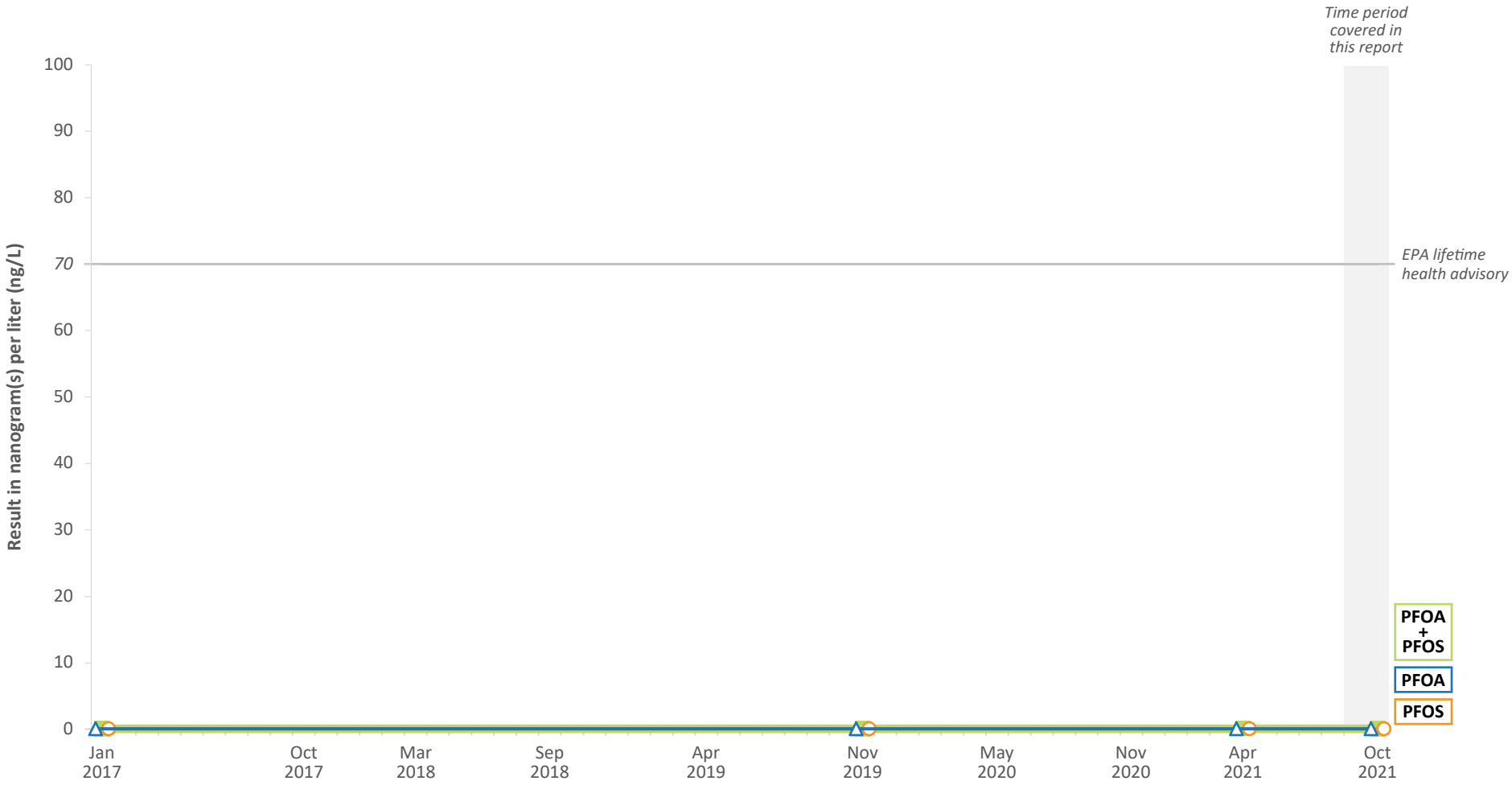


Figure A4-18.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW67
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

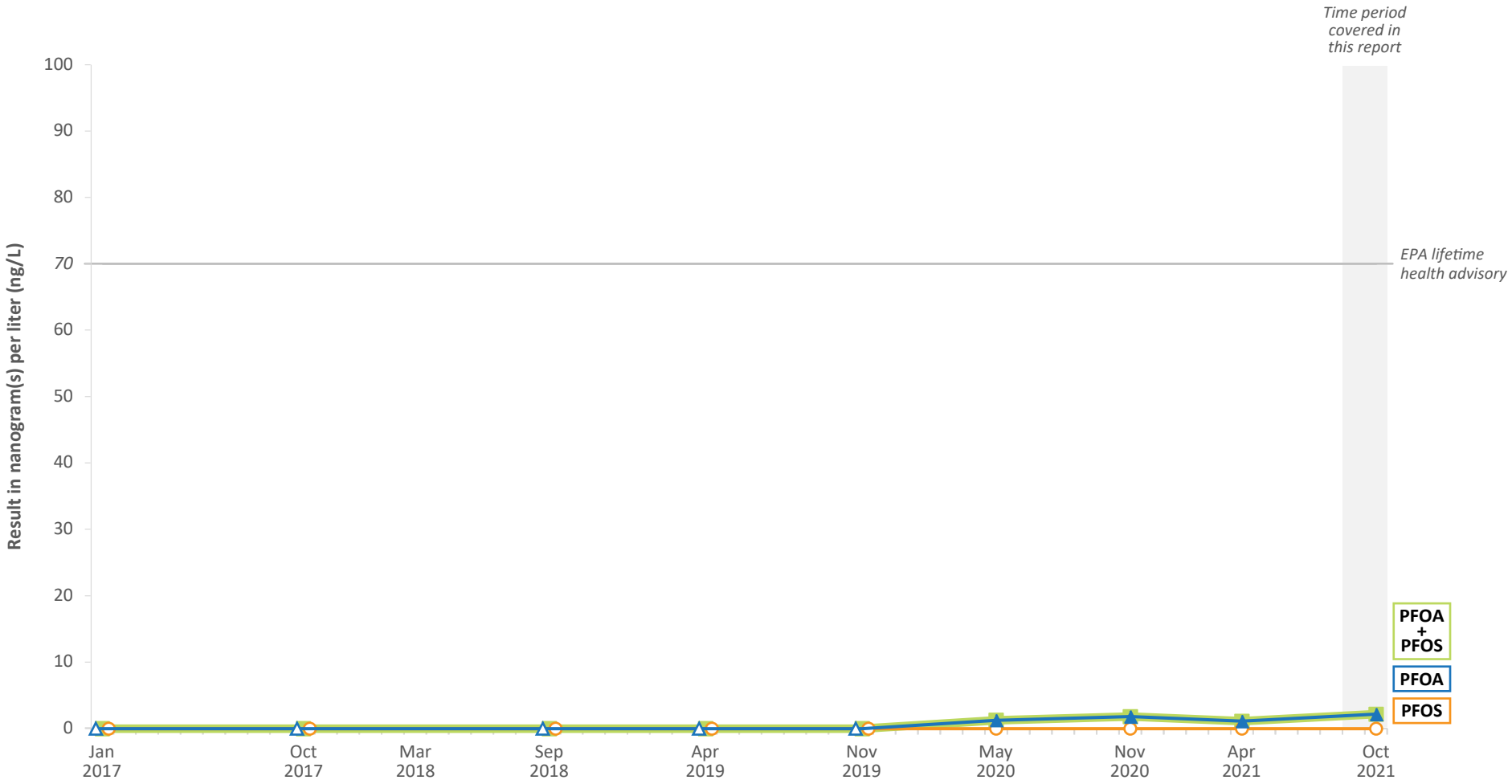


Figure A4-19.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW72
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

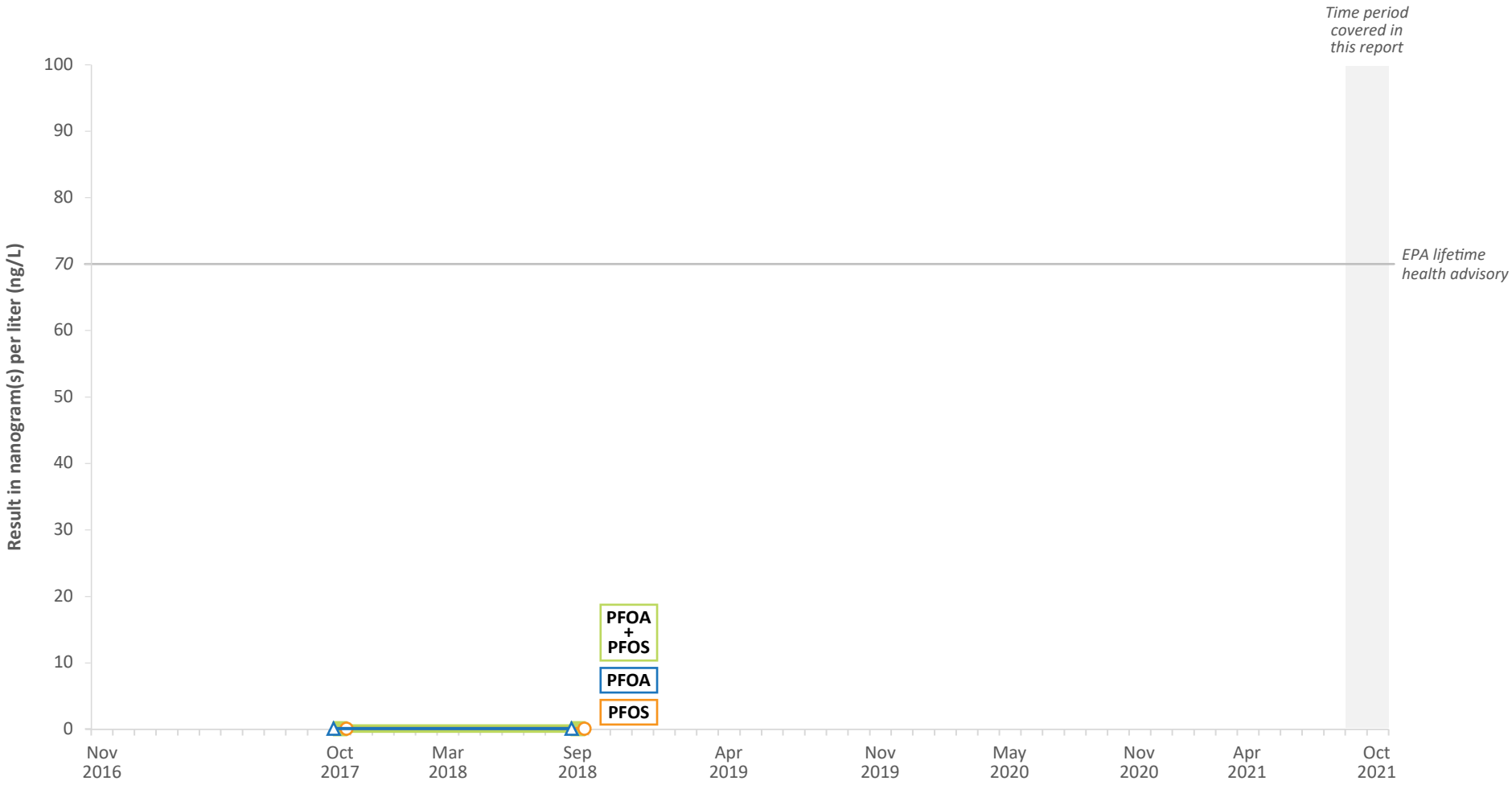


Figure A4-20.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW89
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

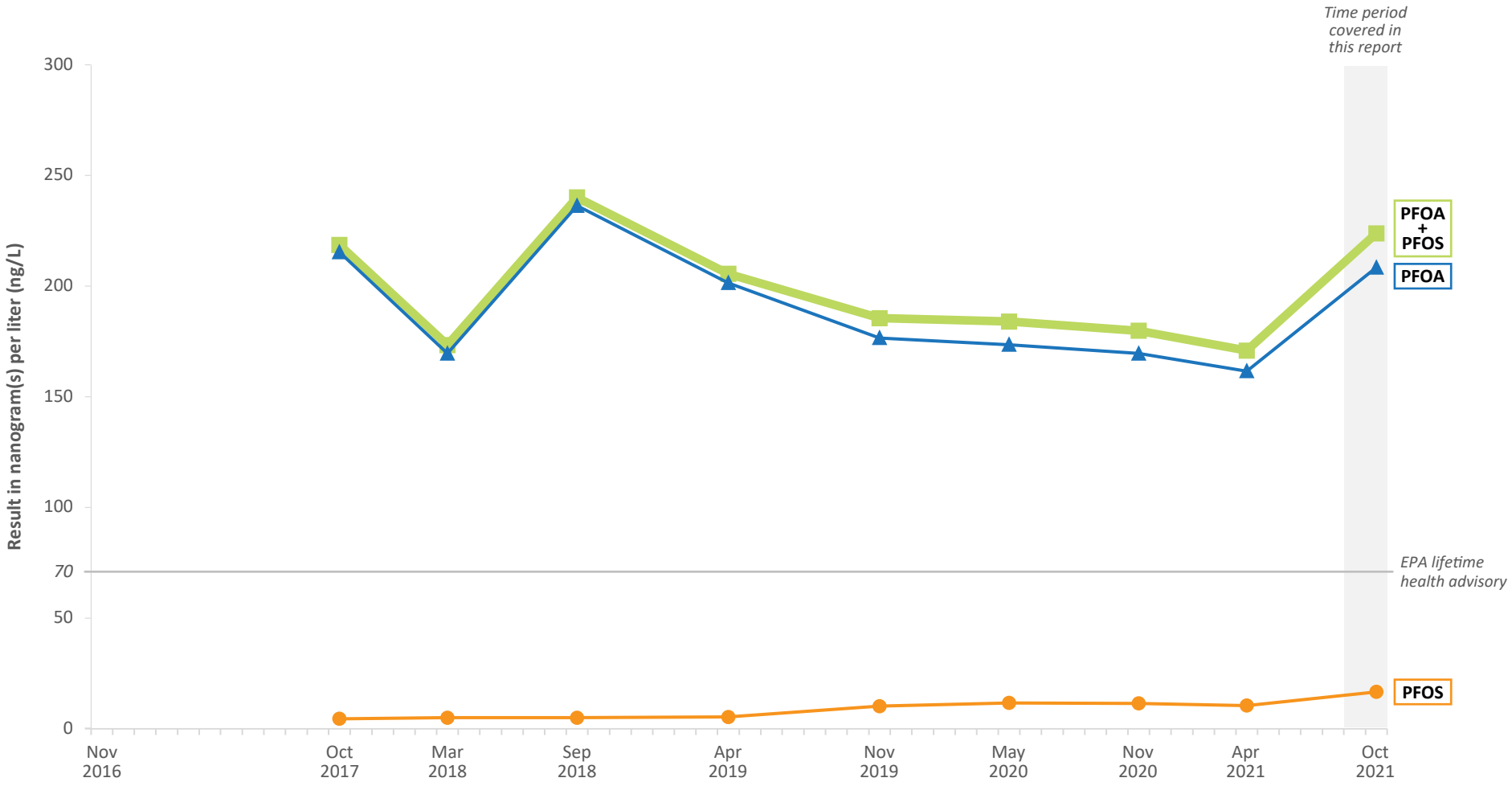


Figure A4-21.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-1RW90
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

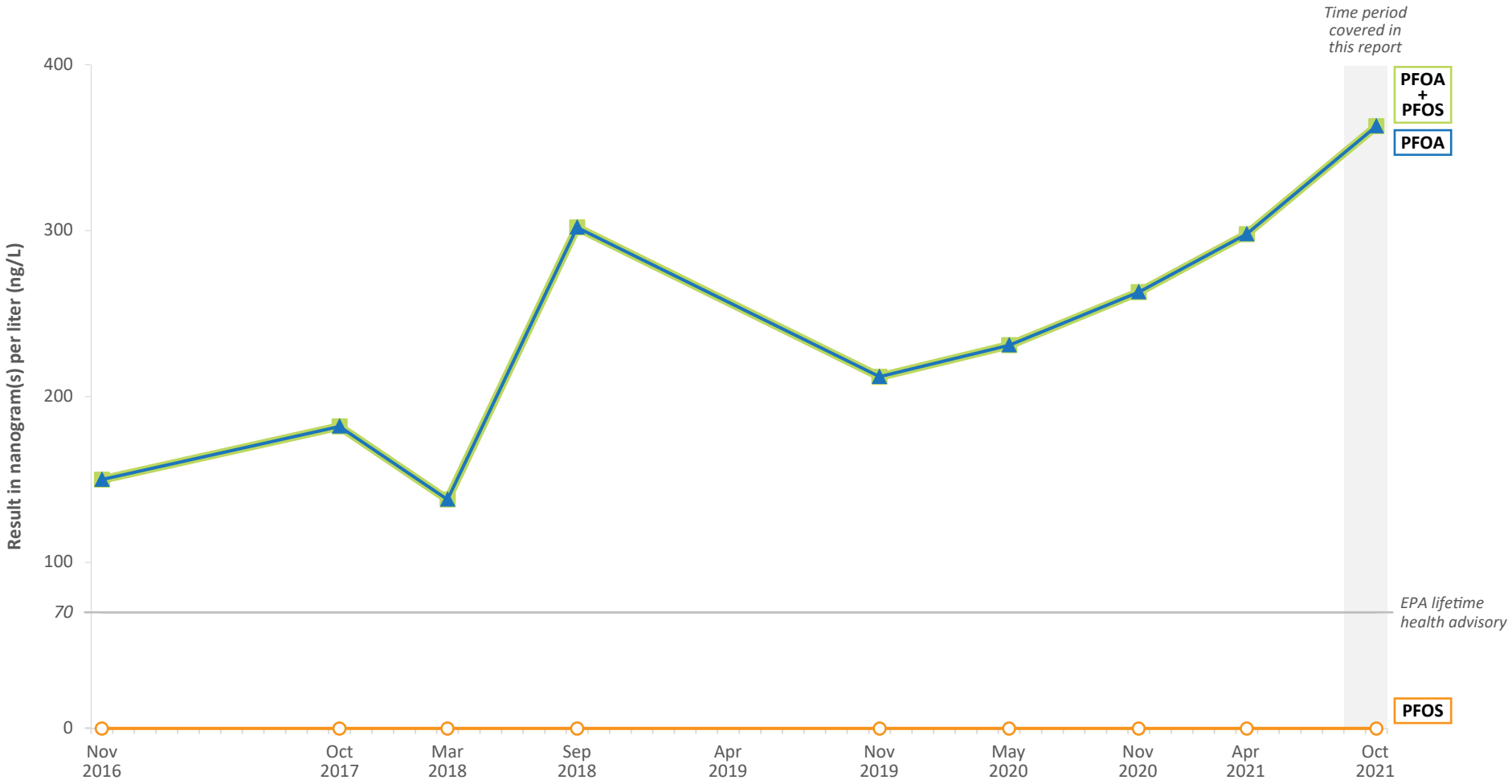


Figure A4-22.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-2RW02
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

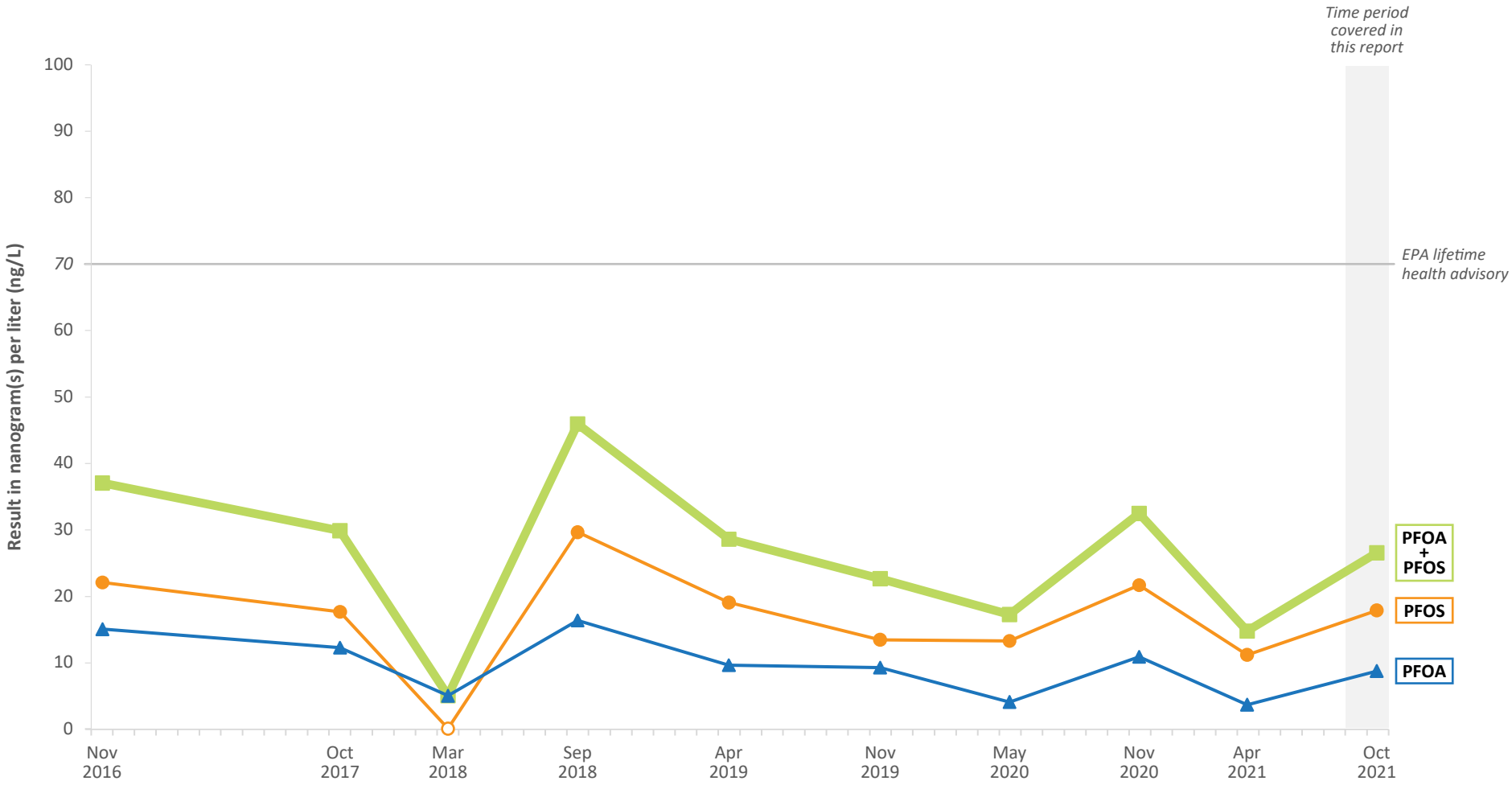


Figure A4-23.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-2RW04
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

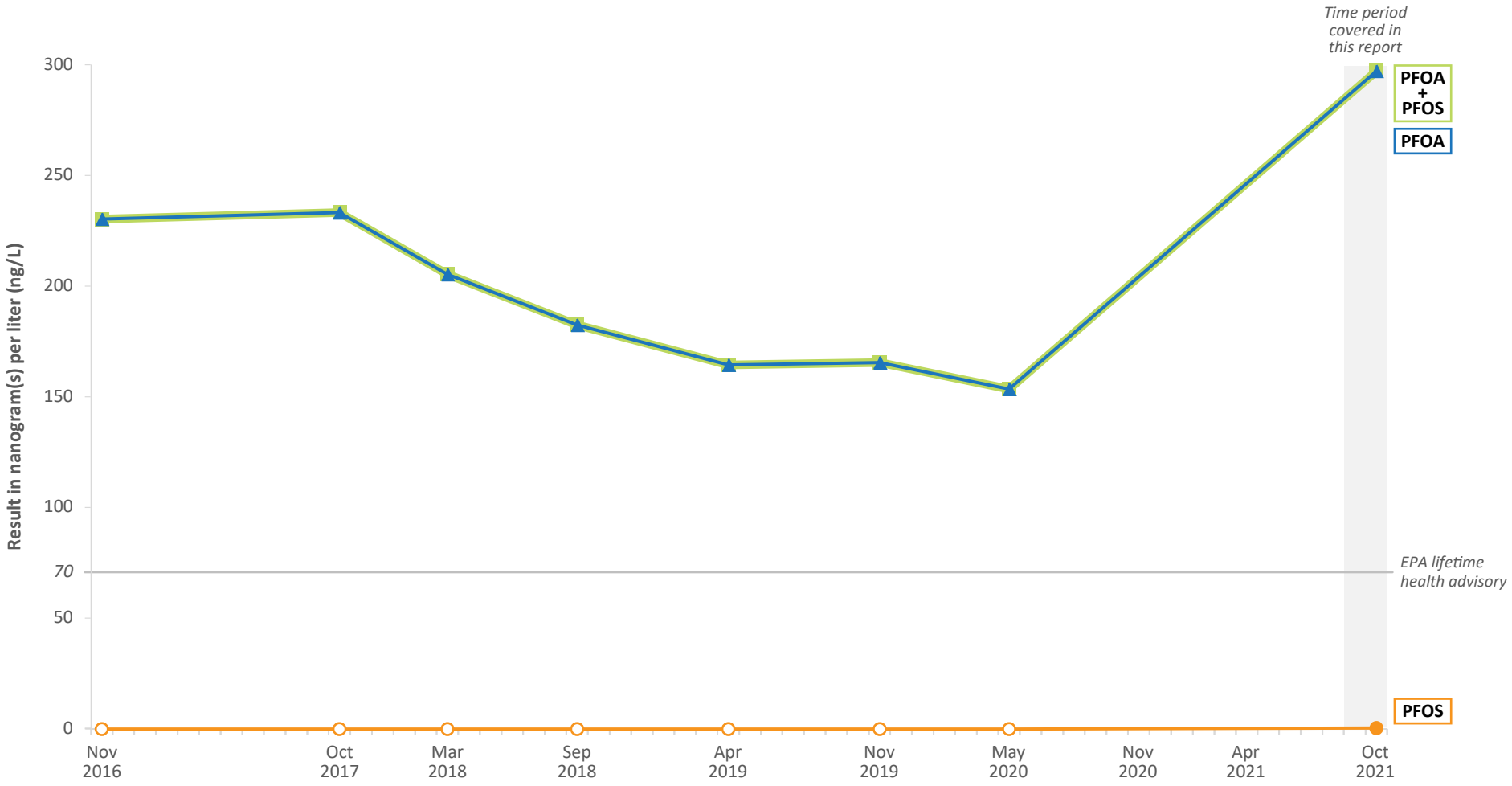


Figure A4-24.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-2RW06
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

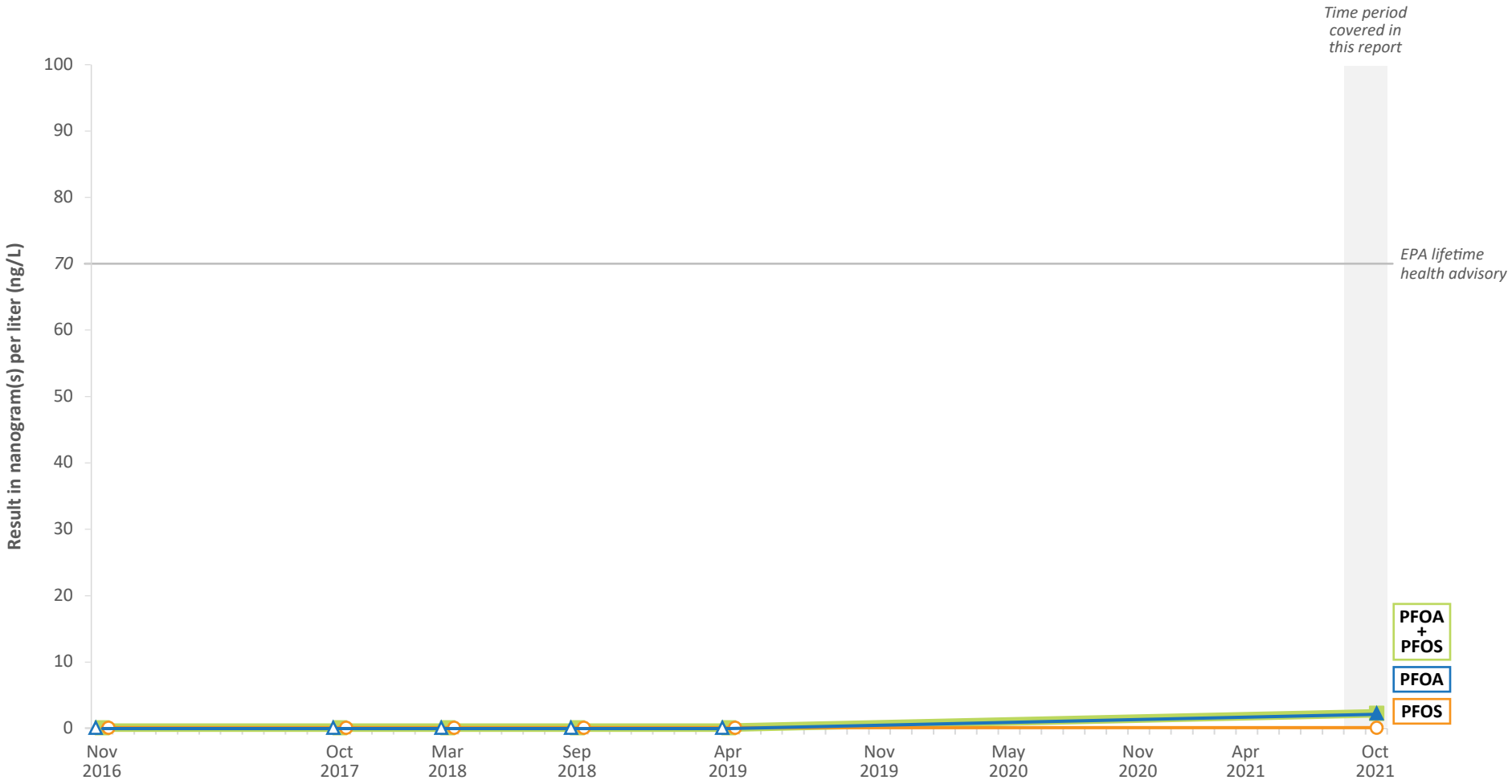


Figure A4-25.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-3RW04
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

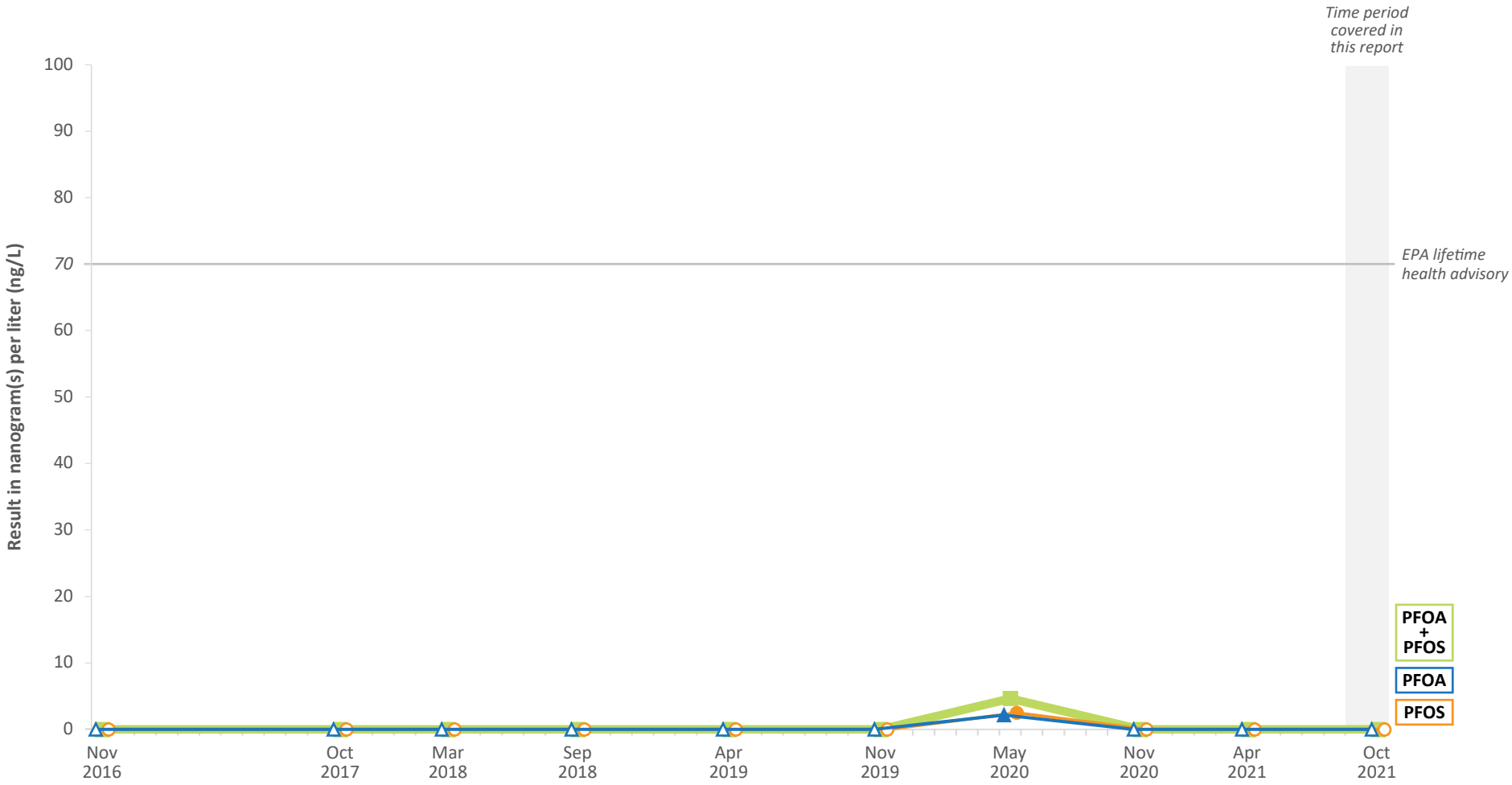


Figure A4-26.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-3RW07
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

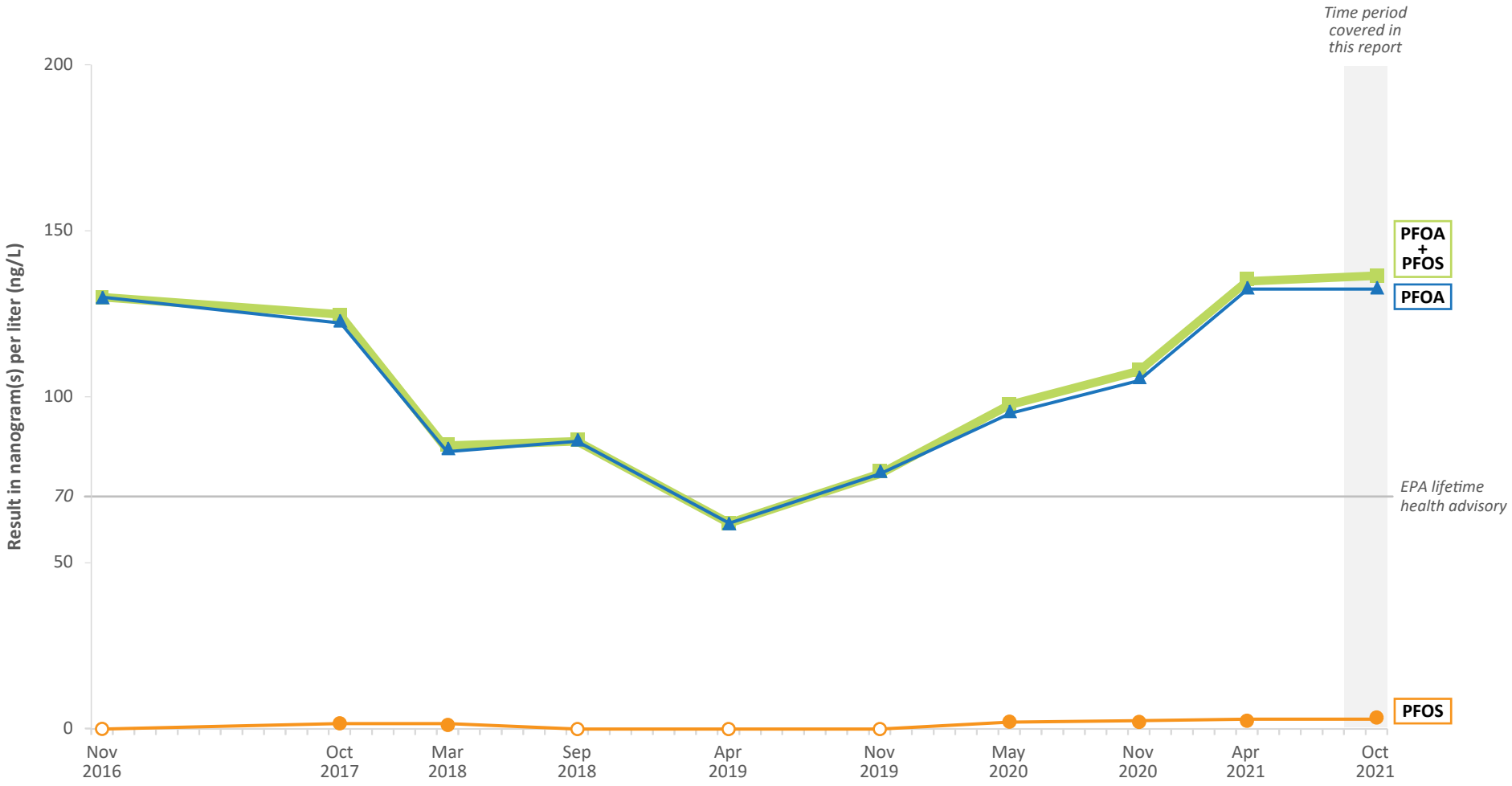


Figure A4-27.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-3RW10
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

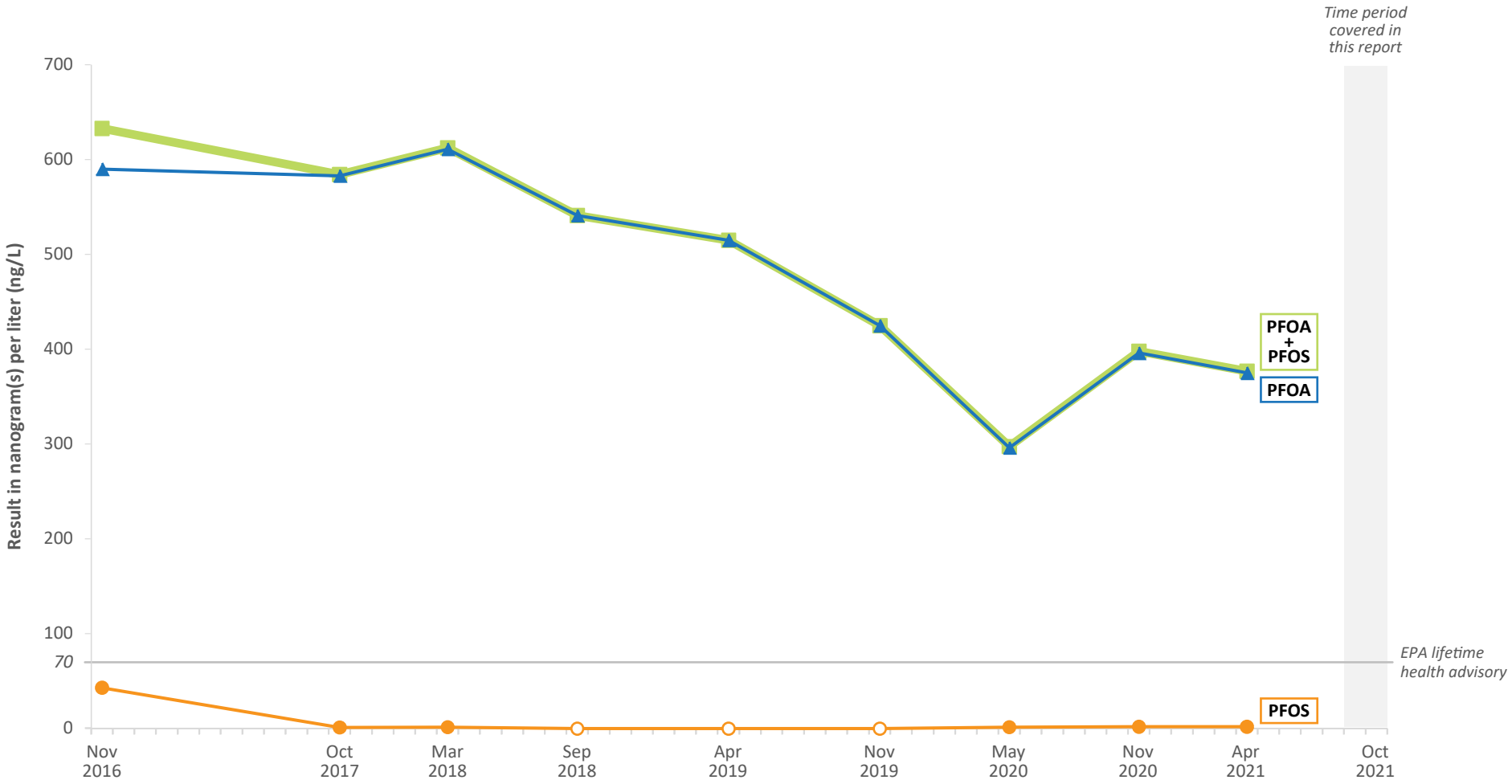


Figure A4-28.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-3RW11
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

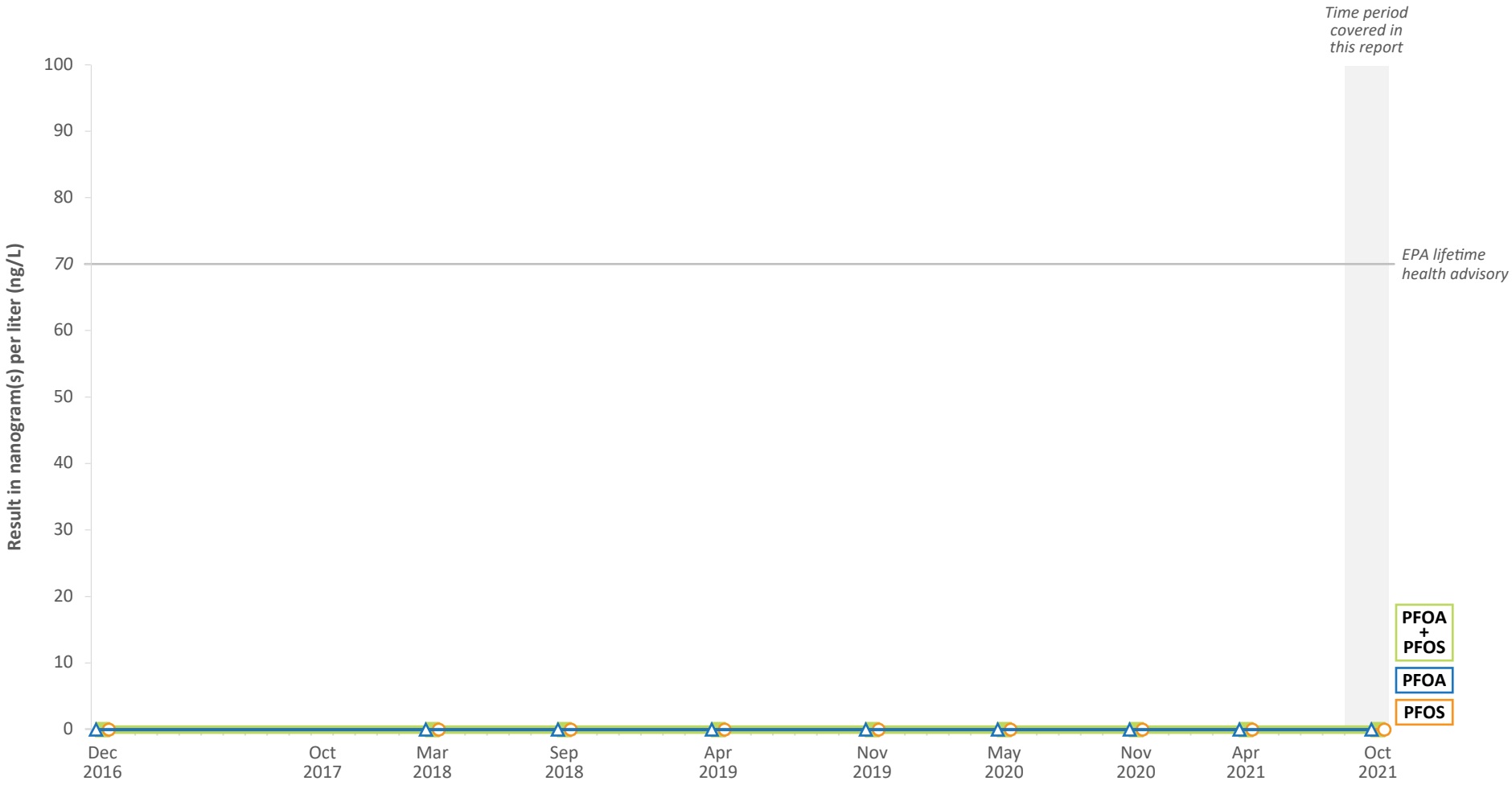


Figure A4-29.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-3RW17
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

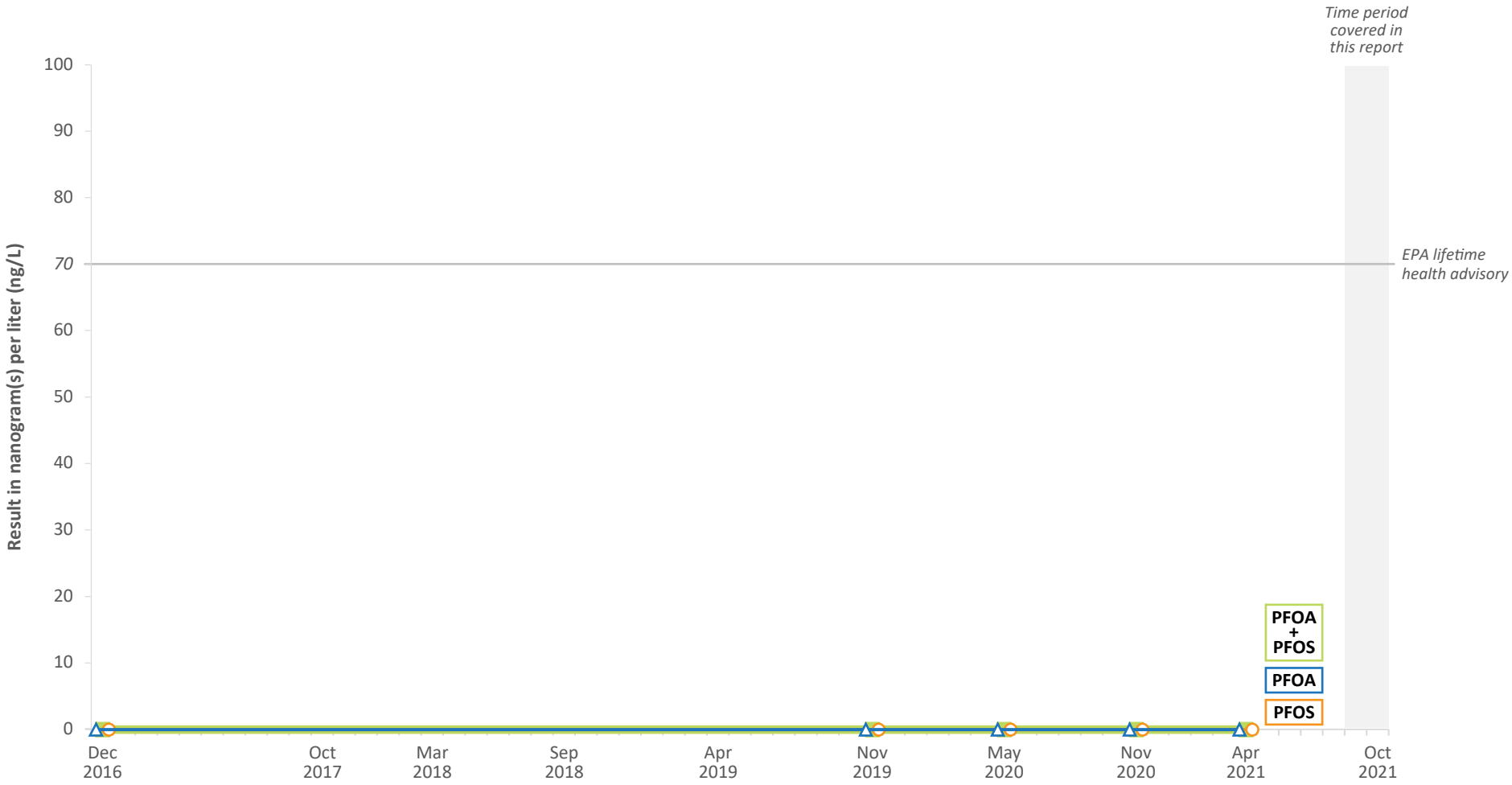
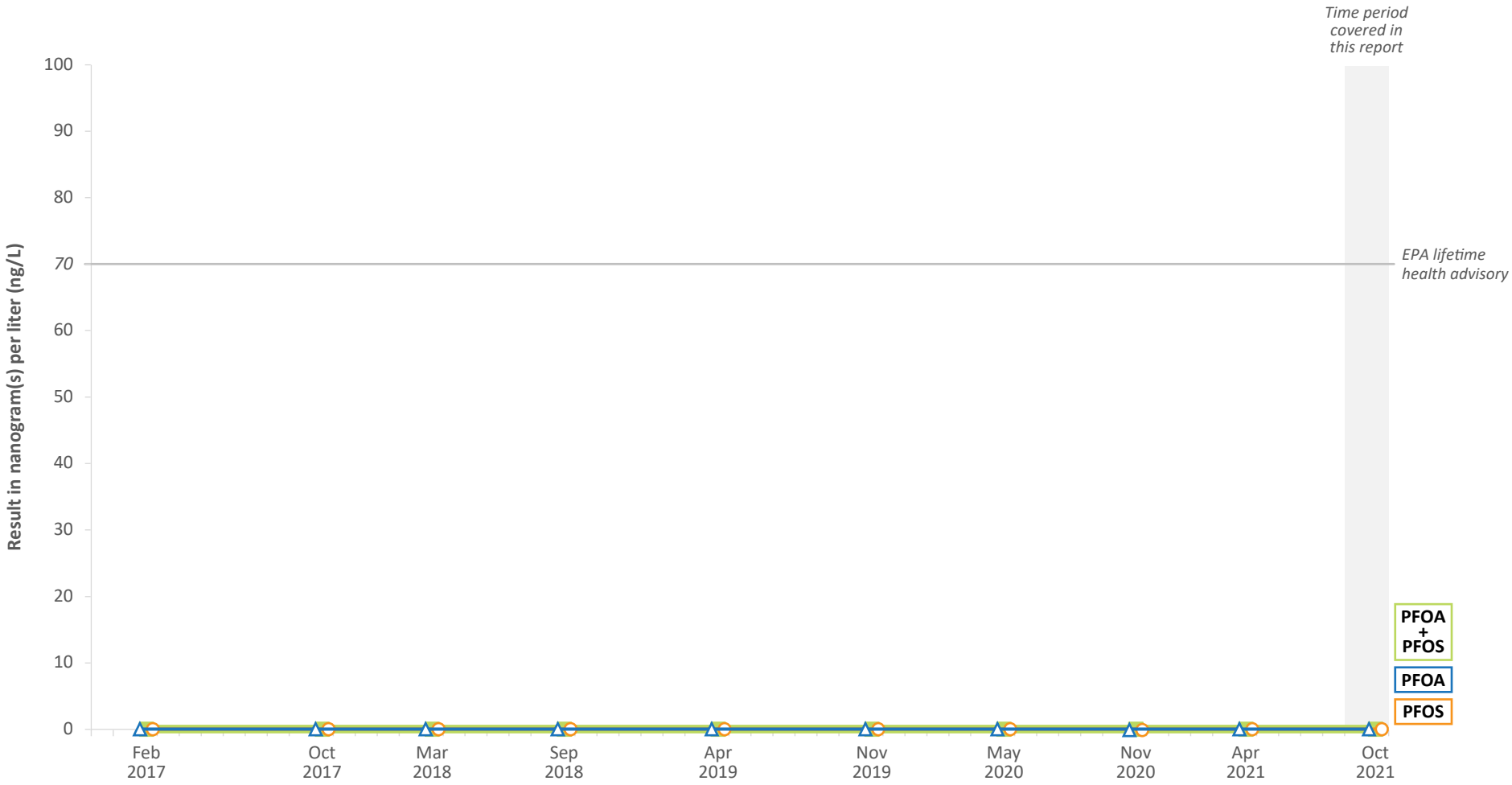


Figure A4-30.
PFOS and PFOA in Drinking Water at Sample Location WI-CV-3RW18
Naval Air Station Whidbey Island
Coupeville, Washington

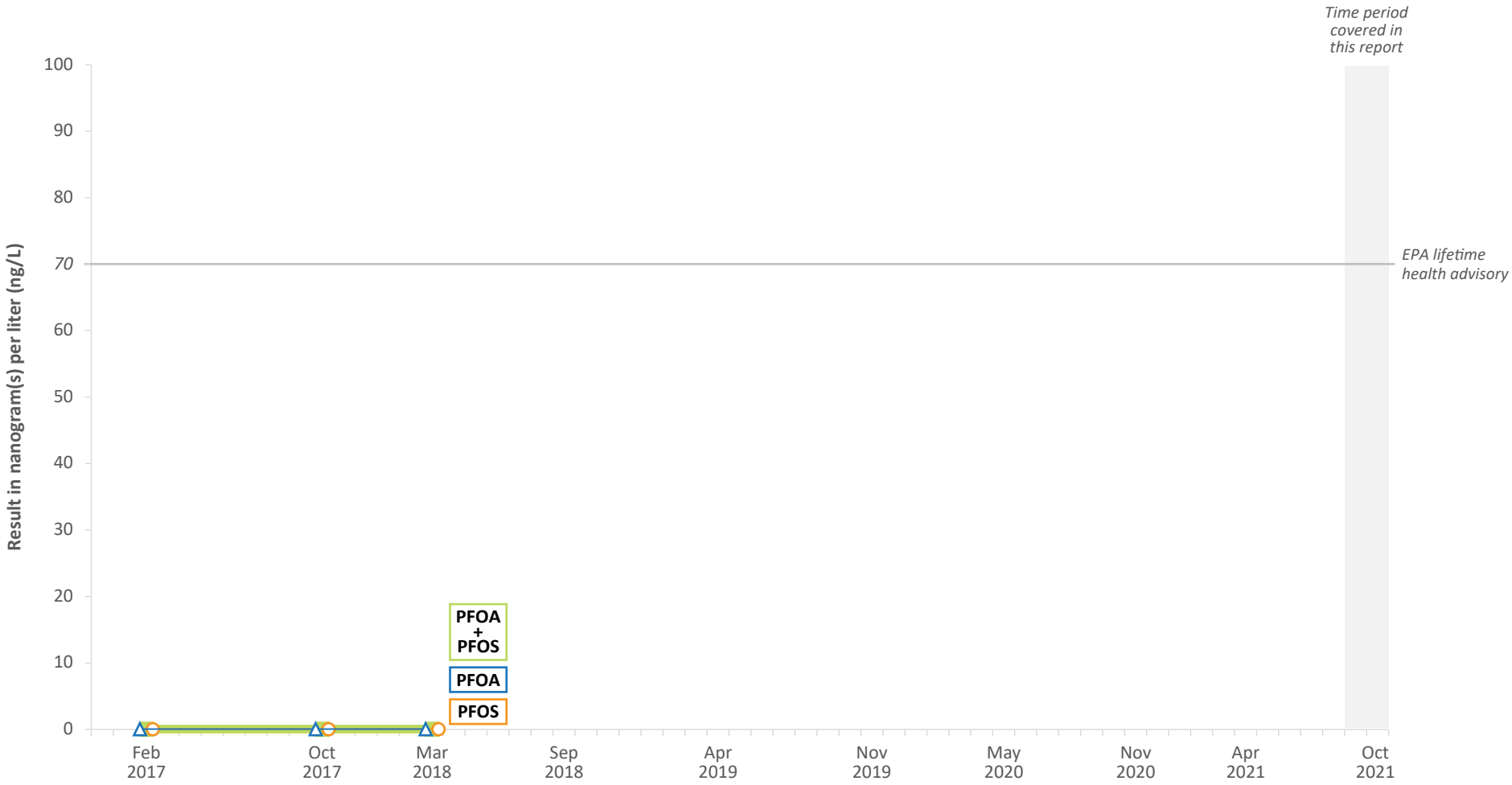
Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The February 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

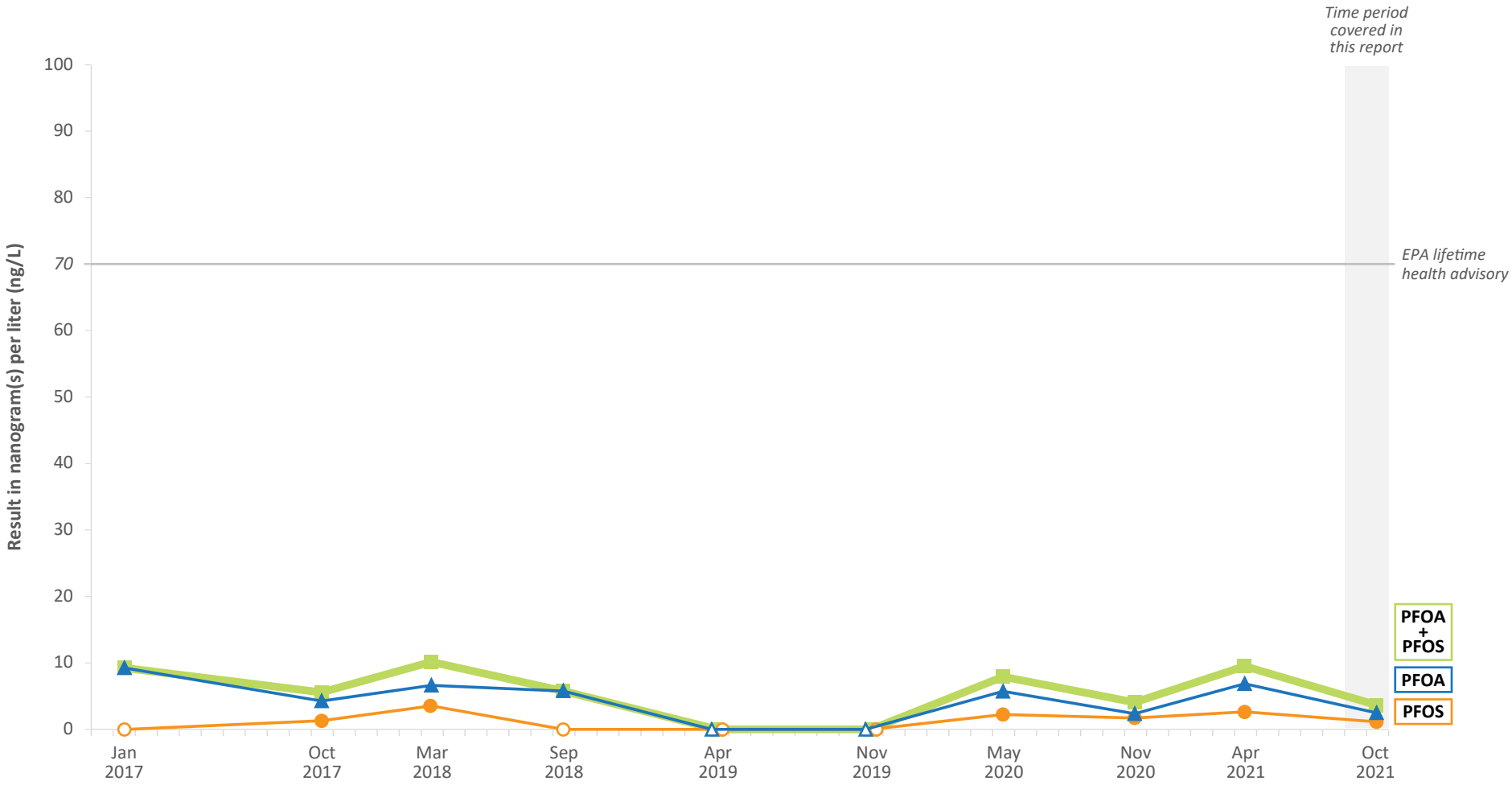
Figure A4-31.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW01
Naval Air Station Whidbey Island
Coupeville, Washington



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The February 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

Figure A4-32.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW11
Naval Air Station Whidbey Island
Coupeville, Washington



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The January 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

Figure A4-33.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW12
Naval Air Station Whidbey Island
Coupeville, Washington

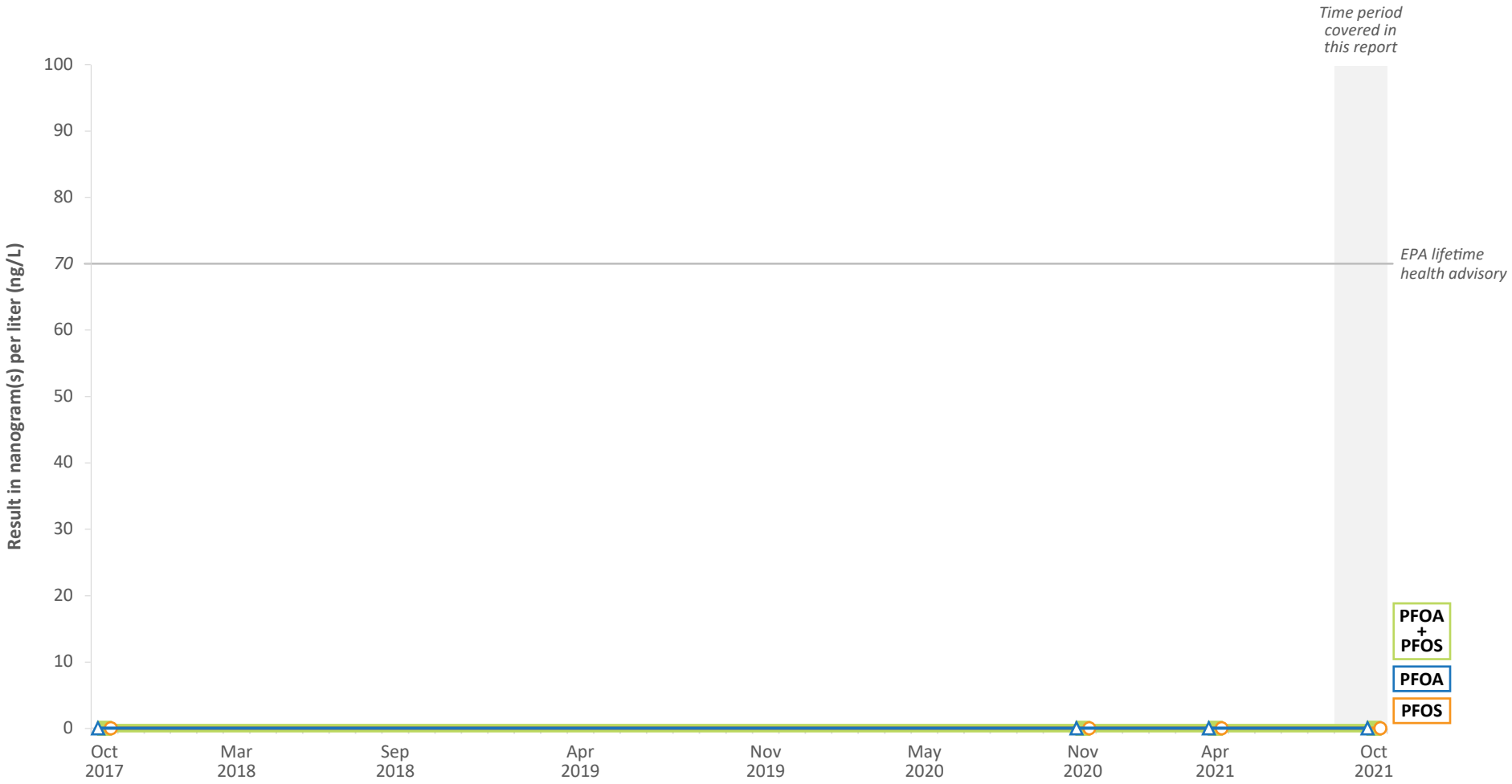
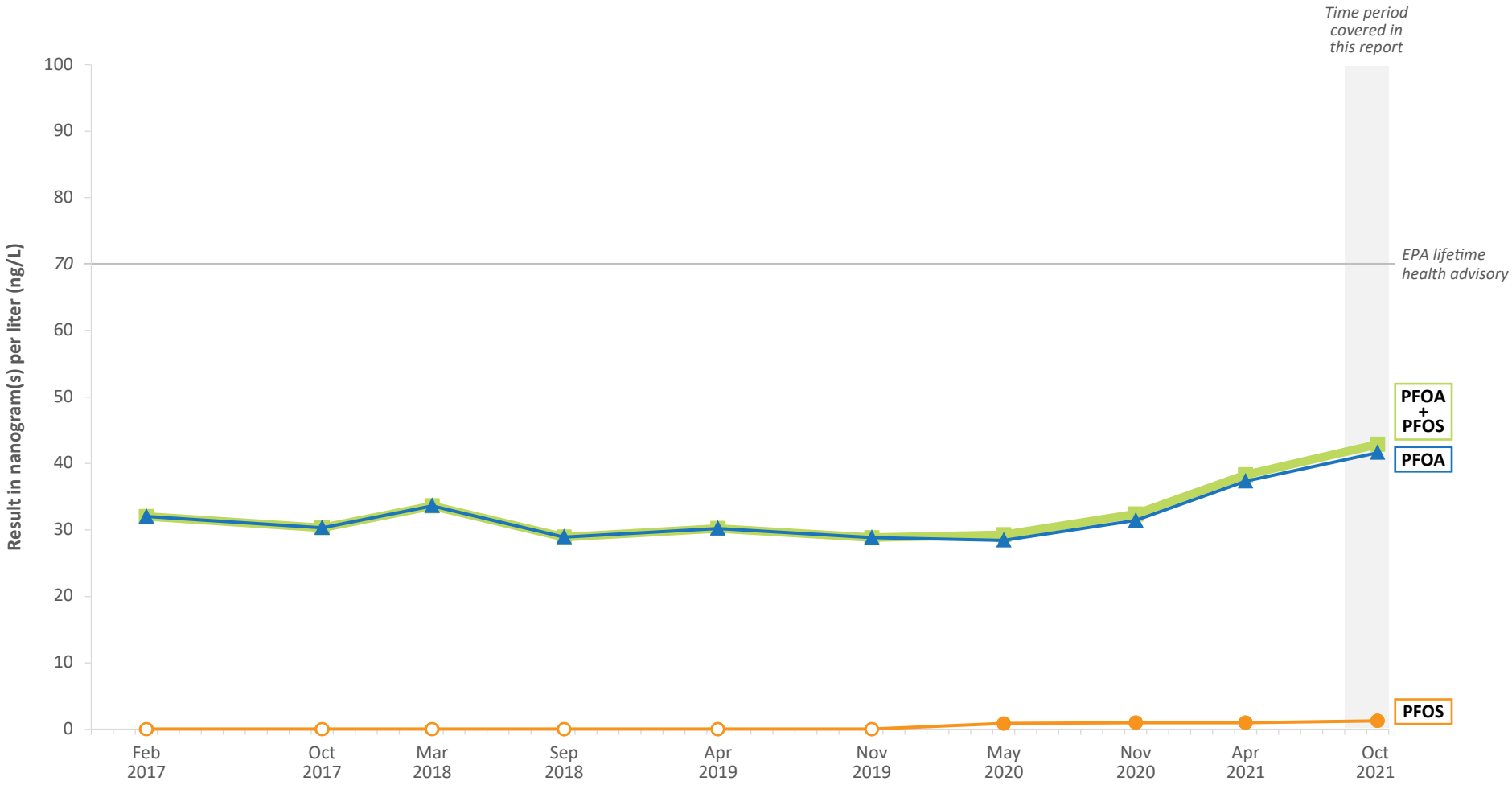


Figure A4-34.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW25
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The February 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

Figure A4-35.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW28
Naval Air Station Whidbey Island
Coupeville, Washington

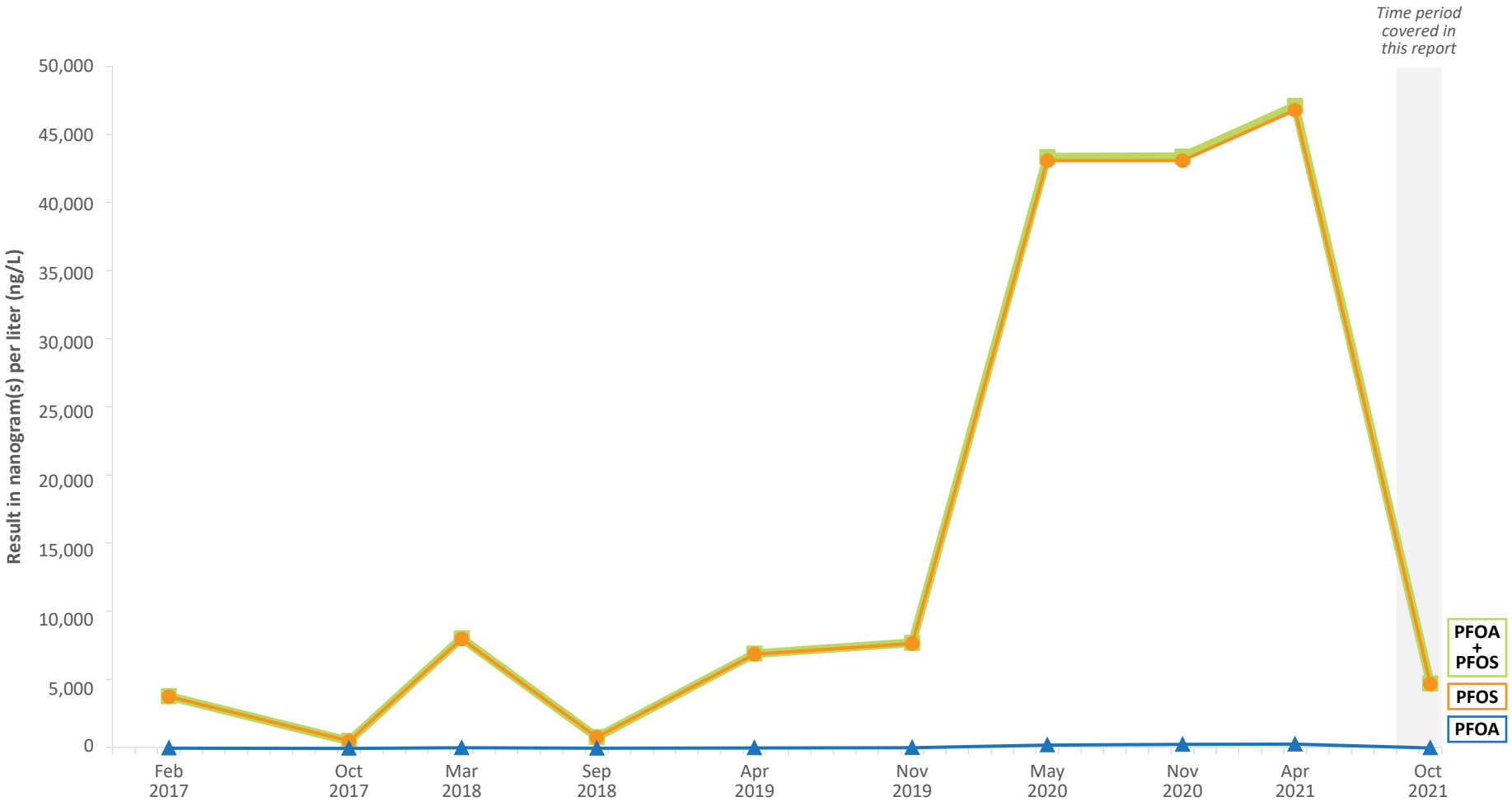
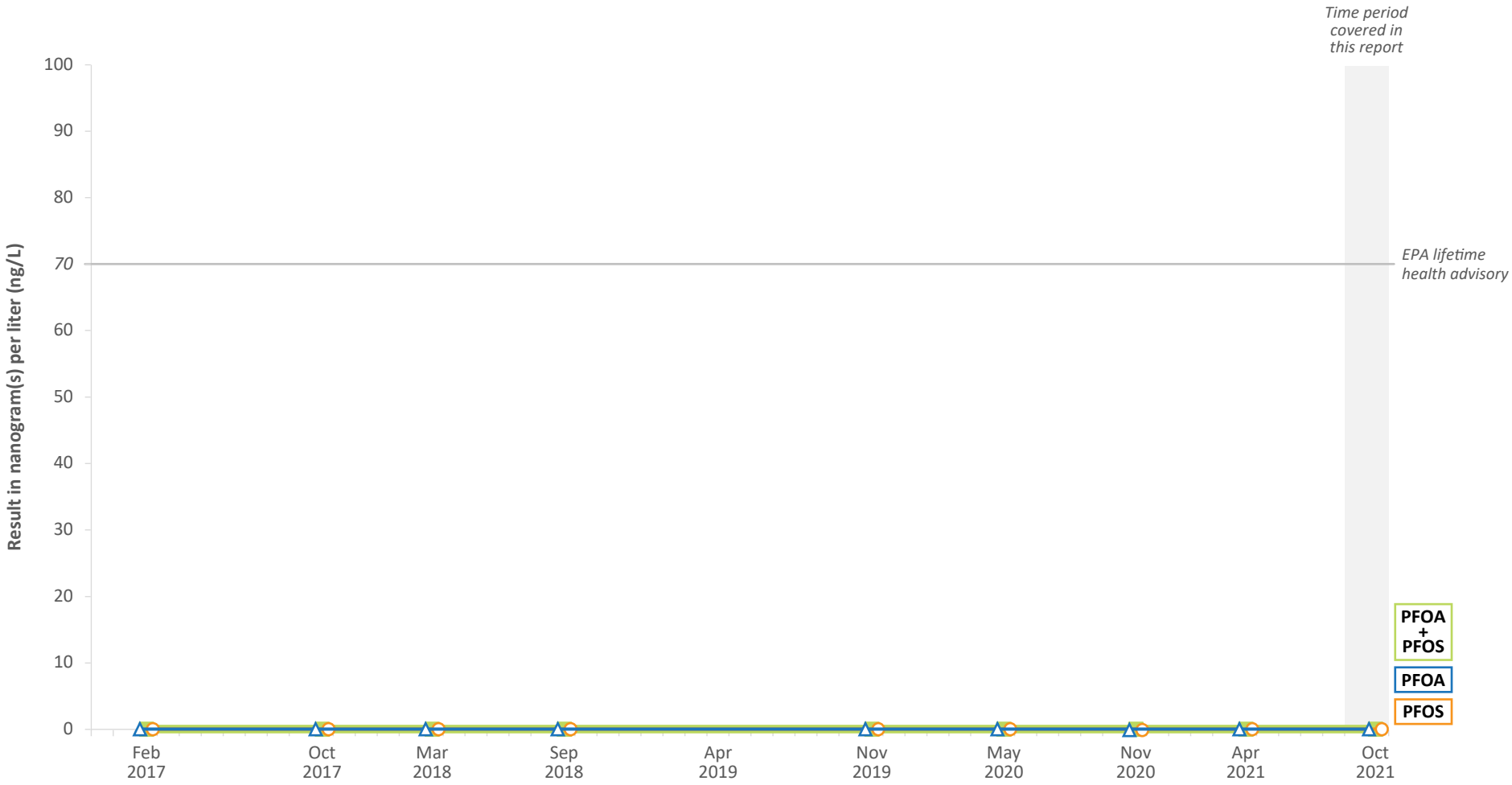


Figure A4-36.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW32
Naval Air Station Whidbey Island
Coupeville, Washington

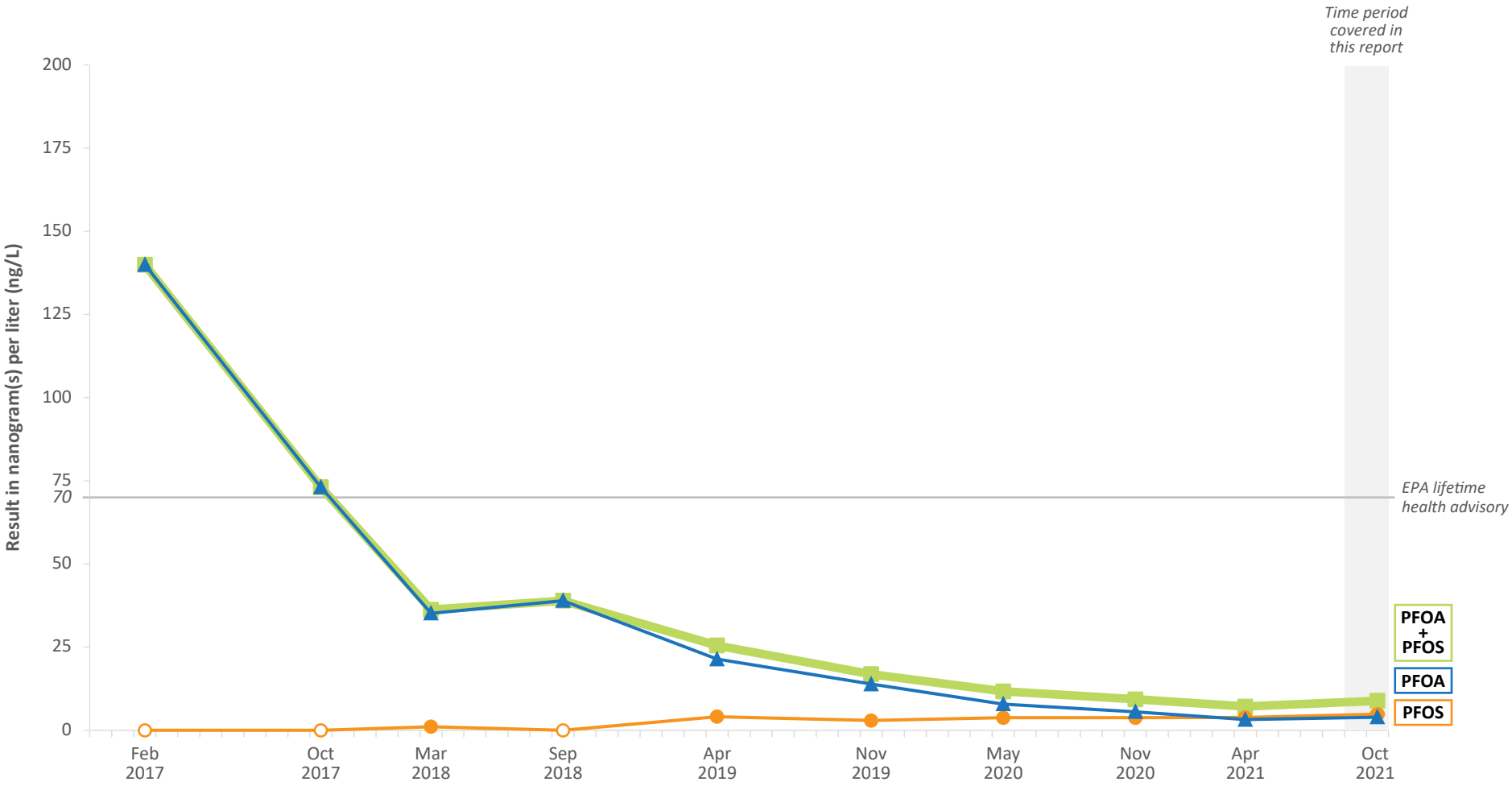
Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. The February 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The February 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

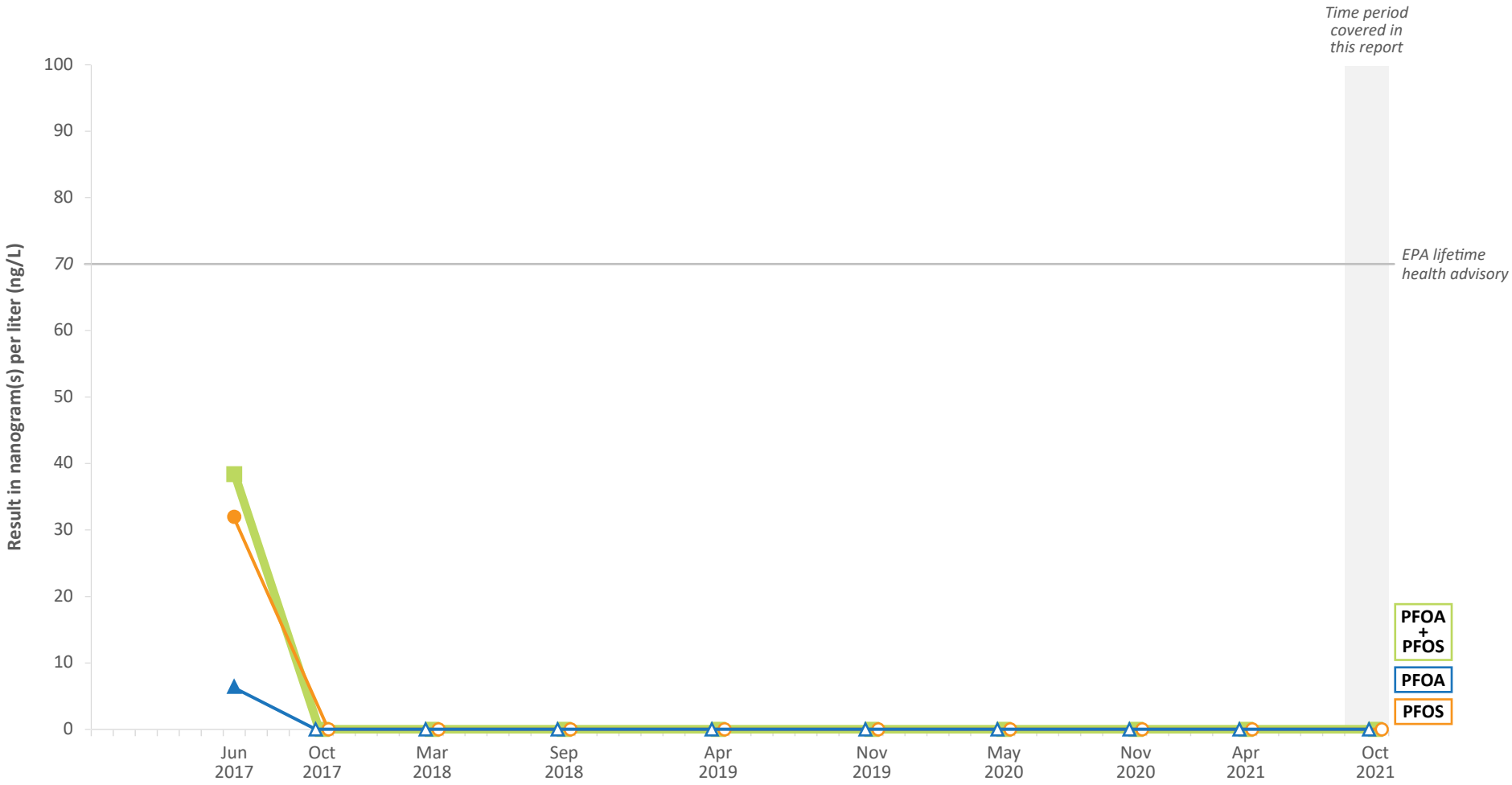
Figure A4-37.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW33
Naval Air Station Whidbey Island
Coupeville, Washington



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The February 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

Figure A4-38.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW40
Naval Air Station Whidbey Island
Coupeville, Washington



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The June 2017 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

Figure A4-39.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW51
Naval Air Station Whidbey Island
Coupeville, Washington

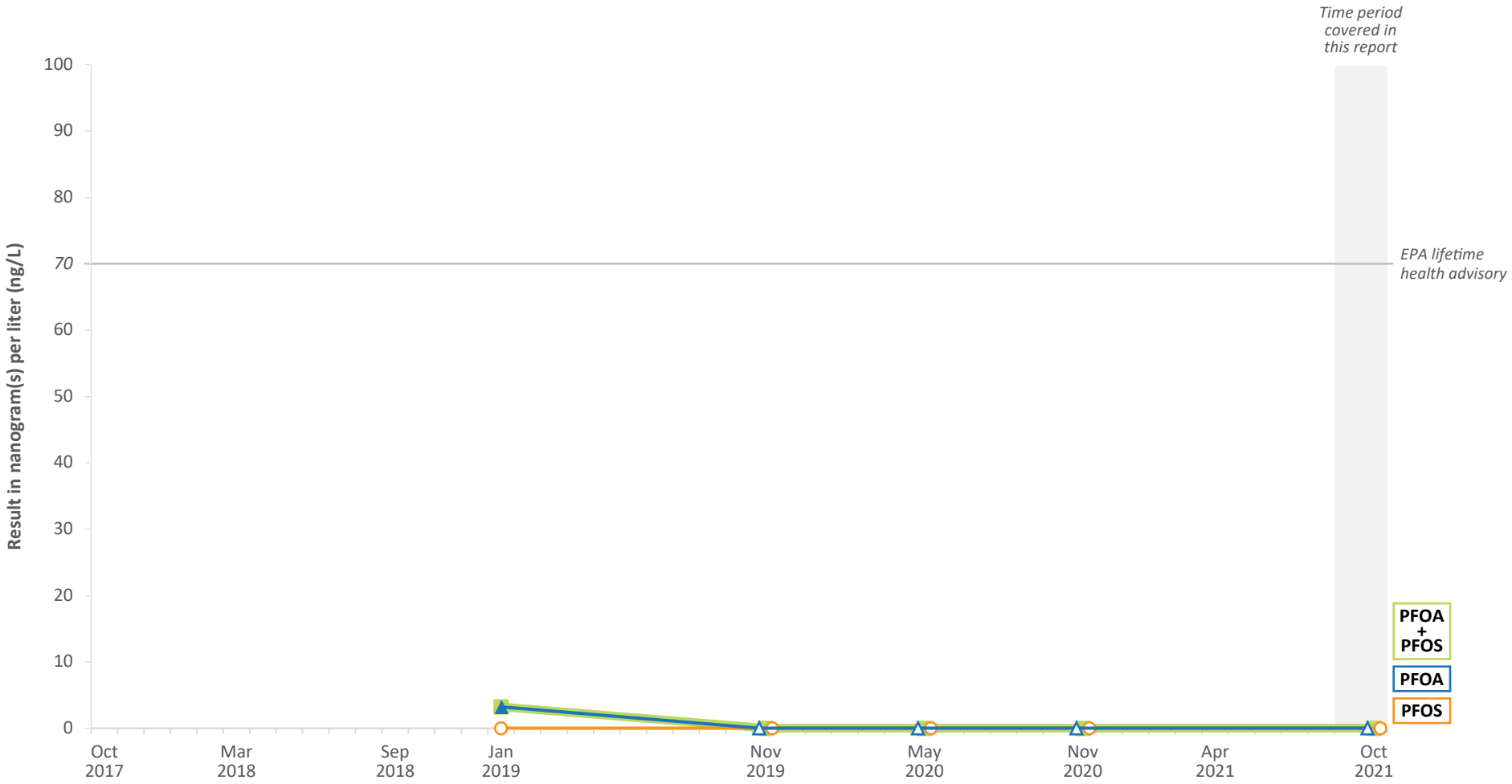


Figure A4-40.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW68
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

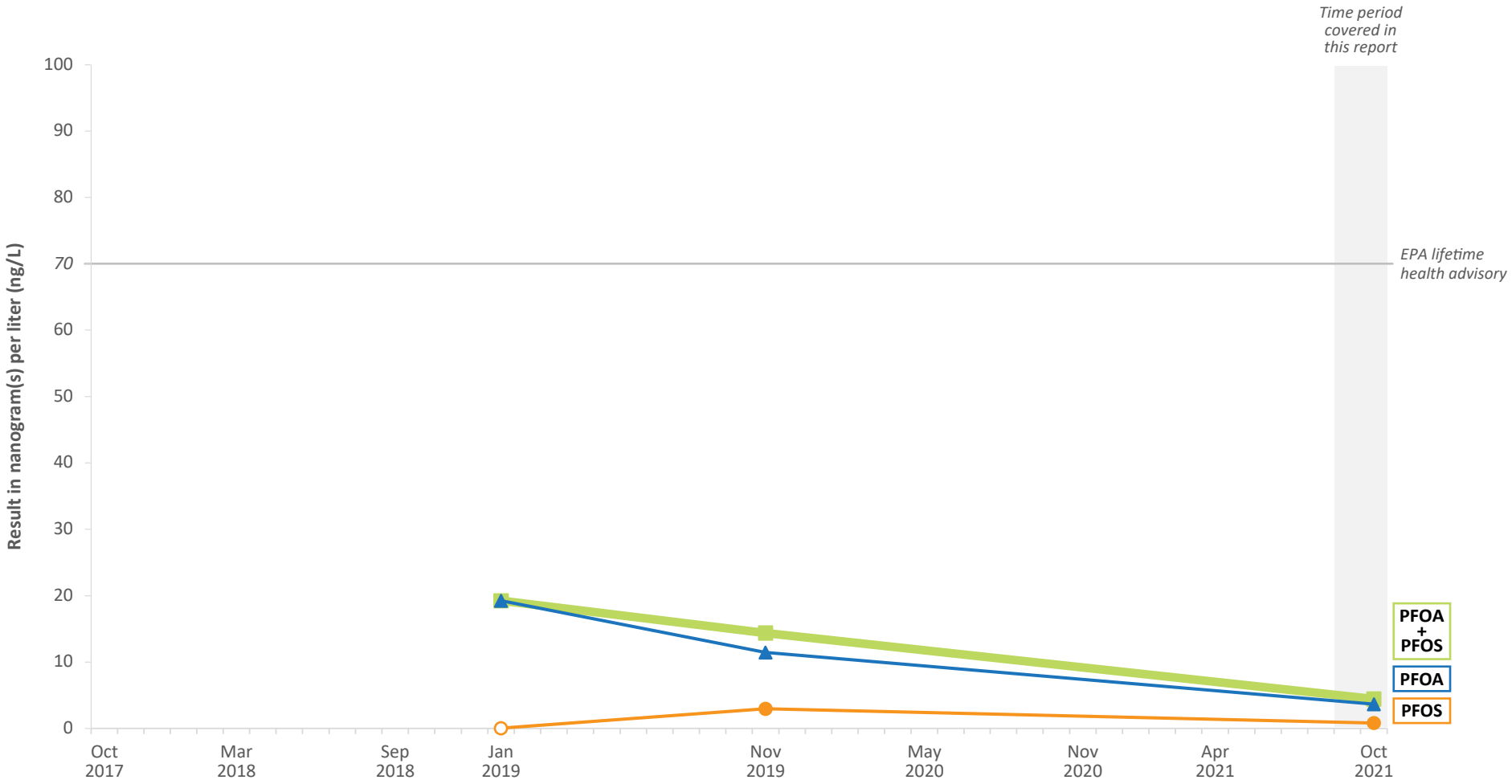


Figure A4-41.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-1RW77
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

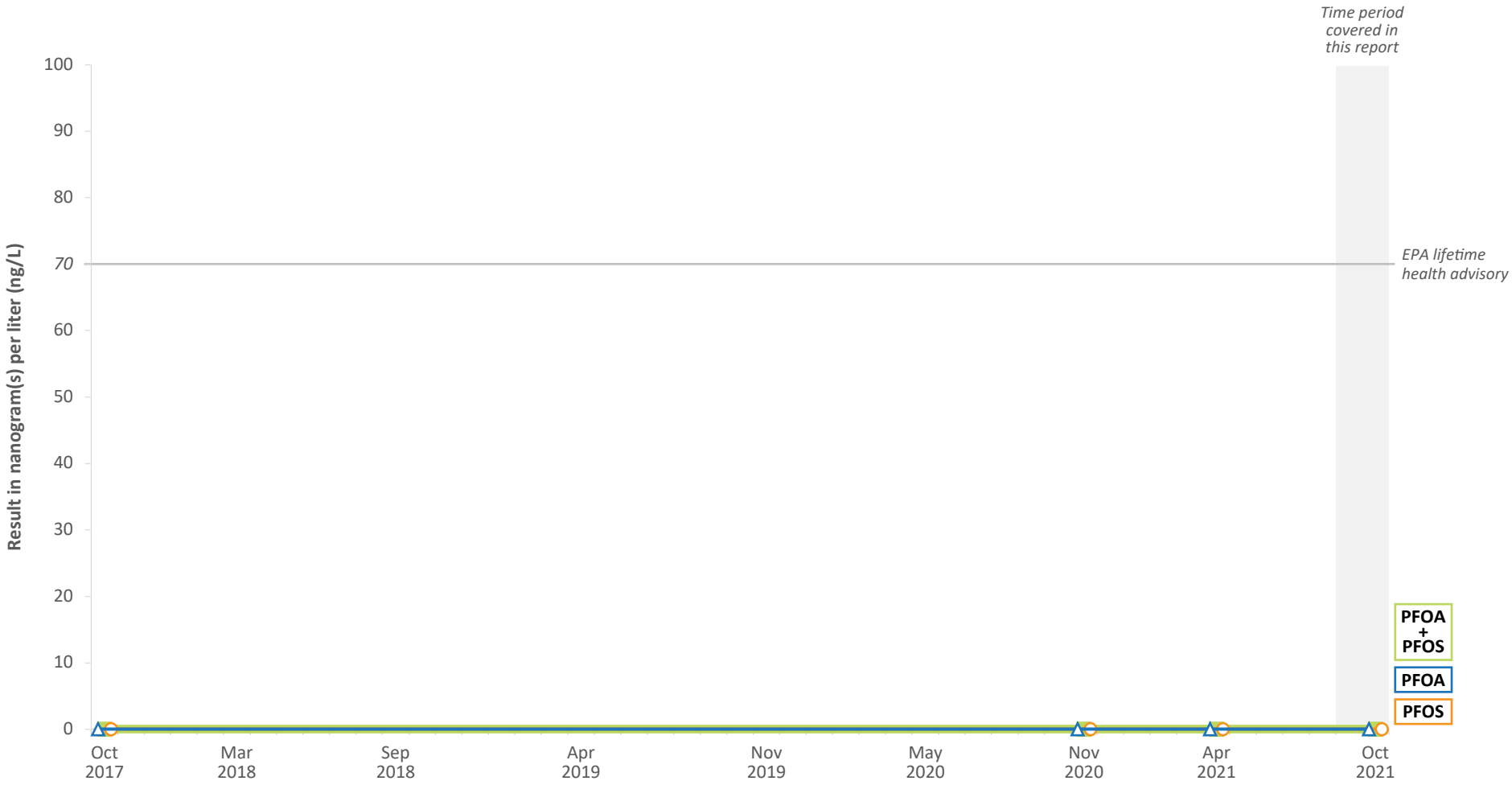
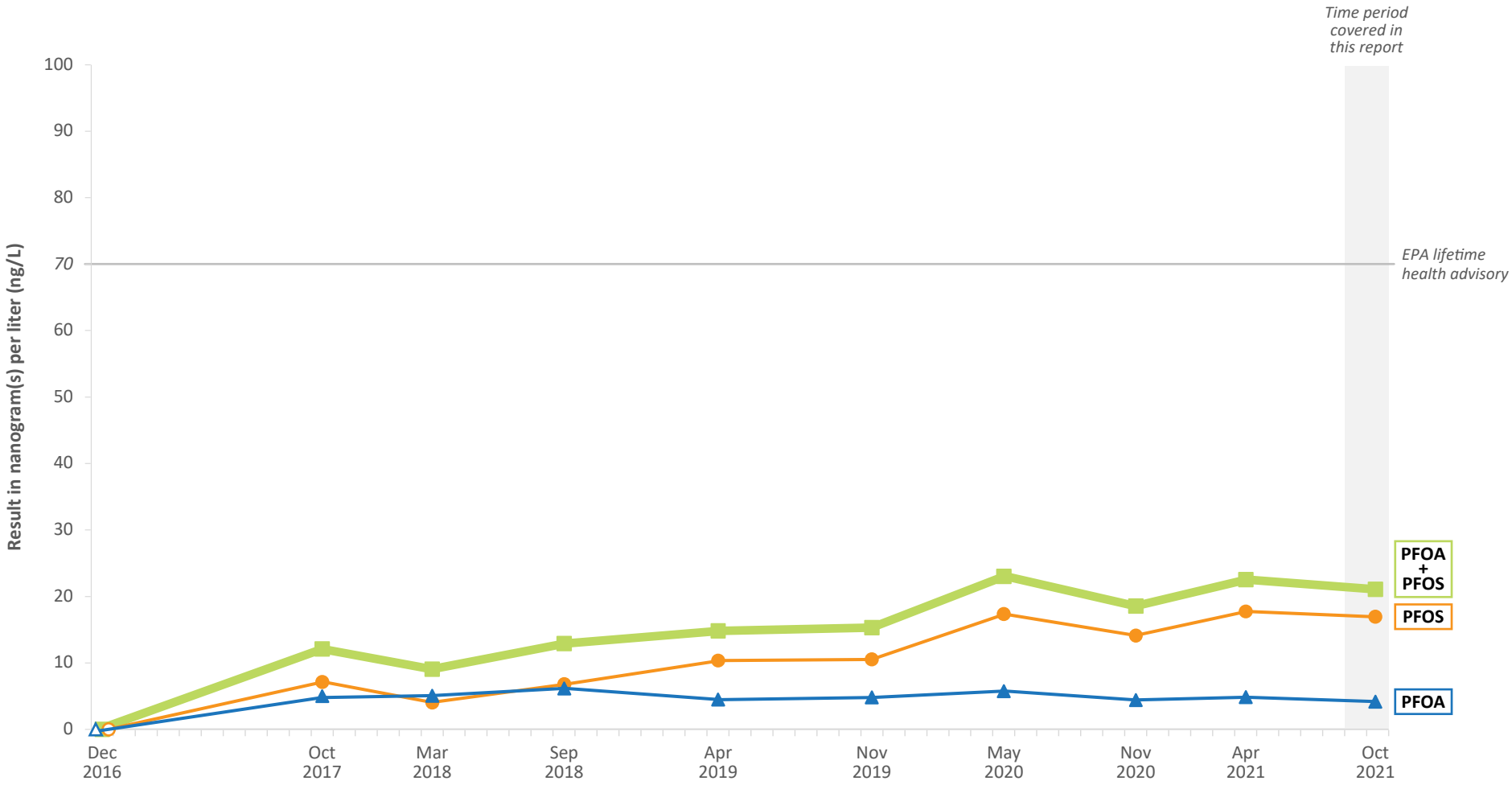


Figure A4-42.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-3RW18
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.



Notes:

1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.
3. The December 2016 data point was omitted in previous technical memorandums, but will be corrected for all future biannual sampling technical memorandums.

Figure A4-43.
PFOS and PFOA in Drinking Water at Sample Location WI-AF-3RW41
Naval Air Station Whidbey Island
Coupeville, Washington

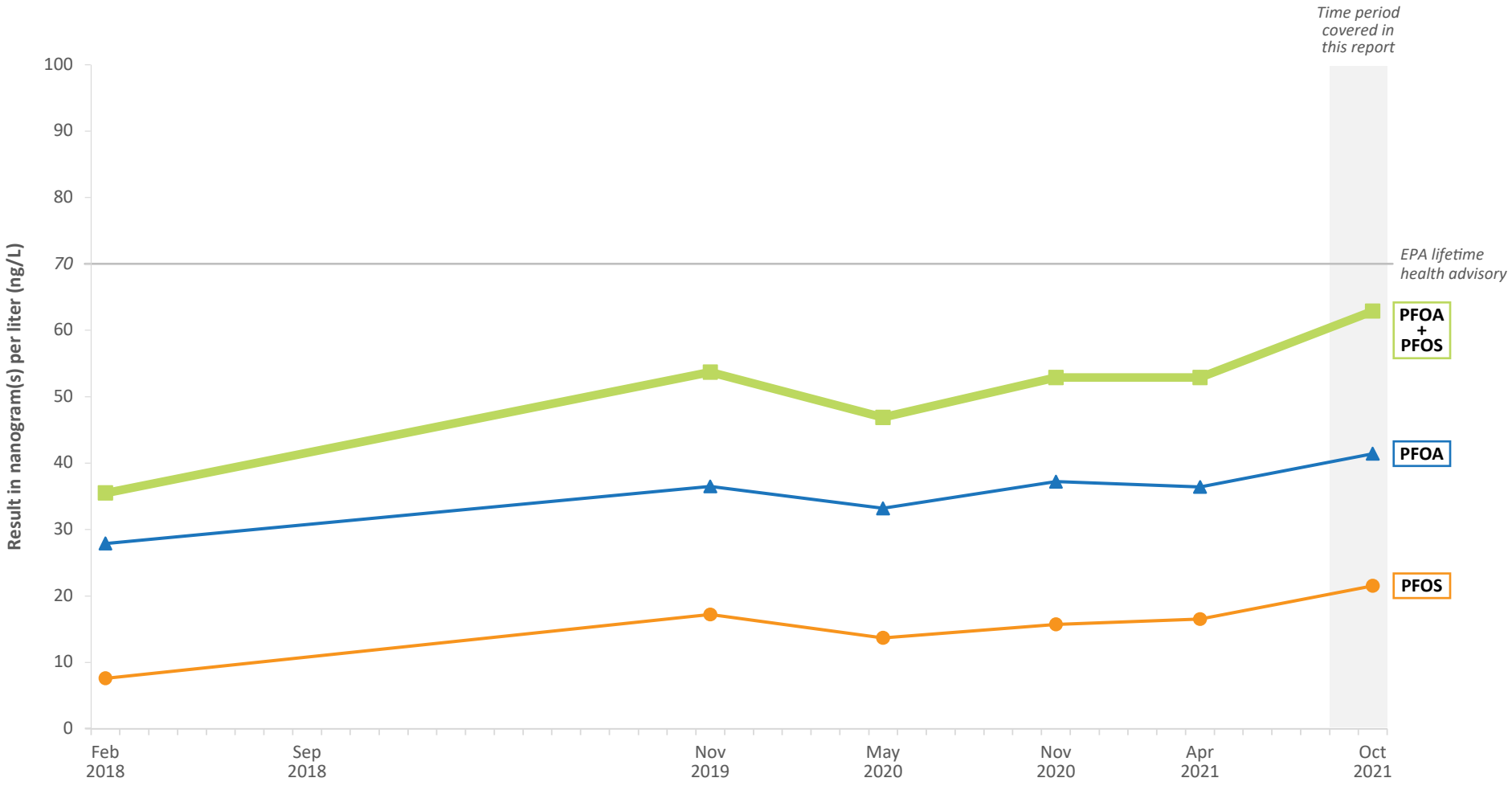


Figure A4-44.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW03
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

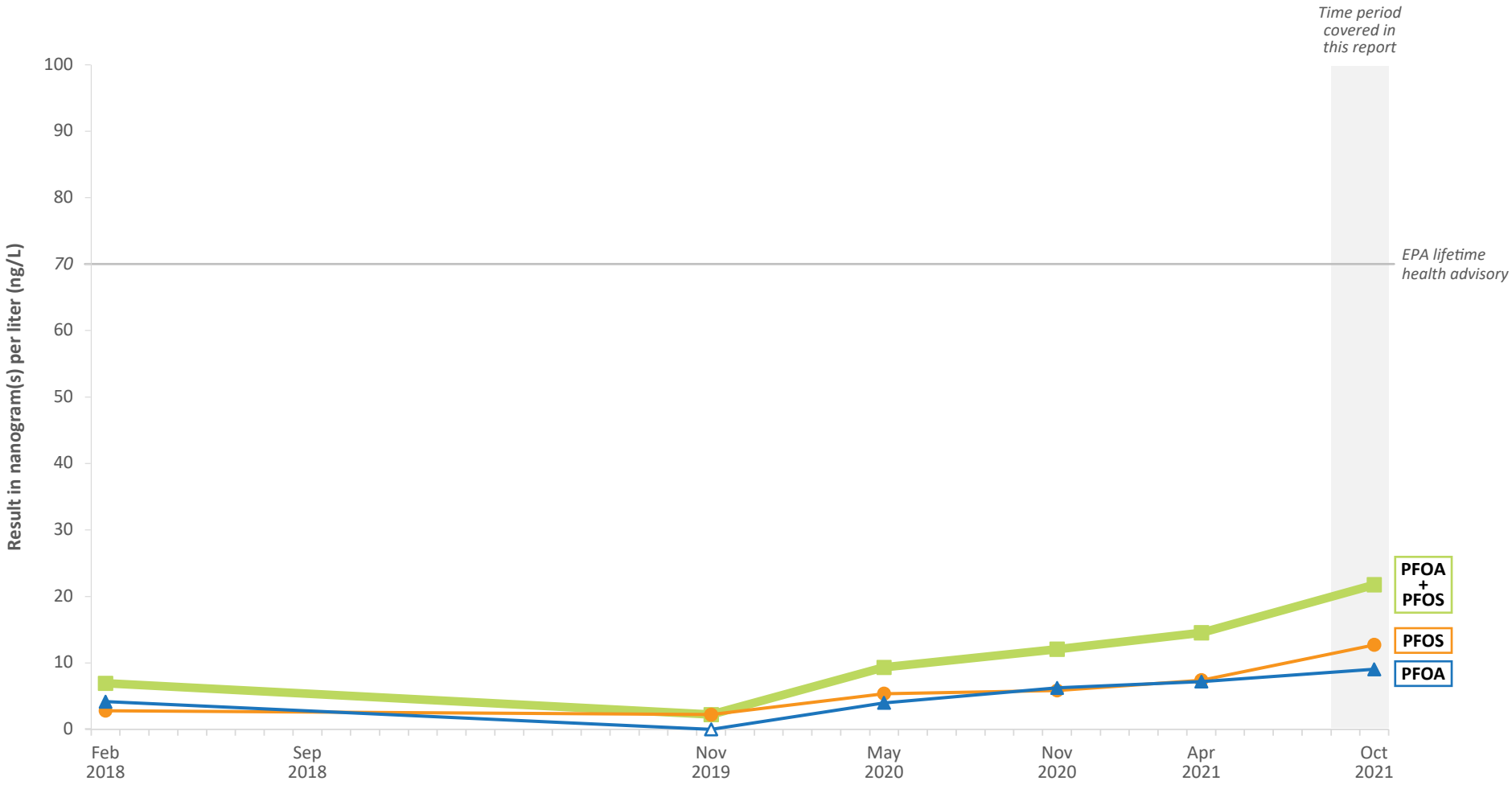


Figure A4-45.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW04
Naval Air Station Whidbey Island
Coupeville, Washington

Notes:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.
2. Empty data points indicate non-detect values.

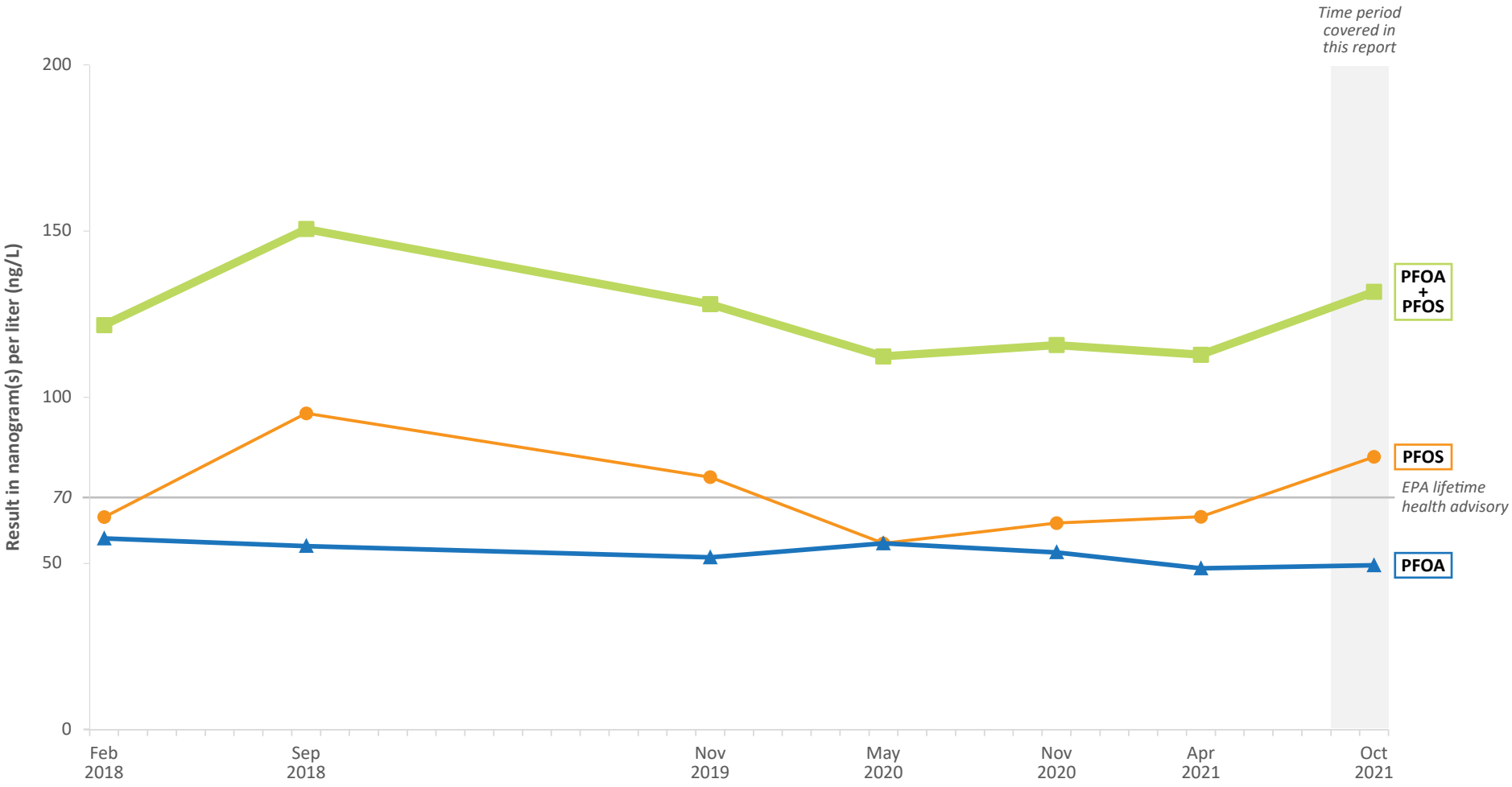


Figure A4-46.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW05
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

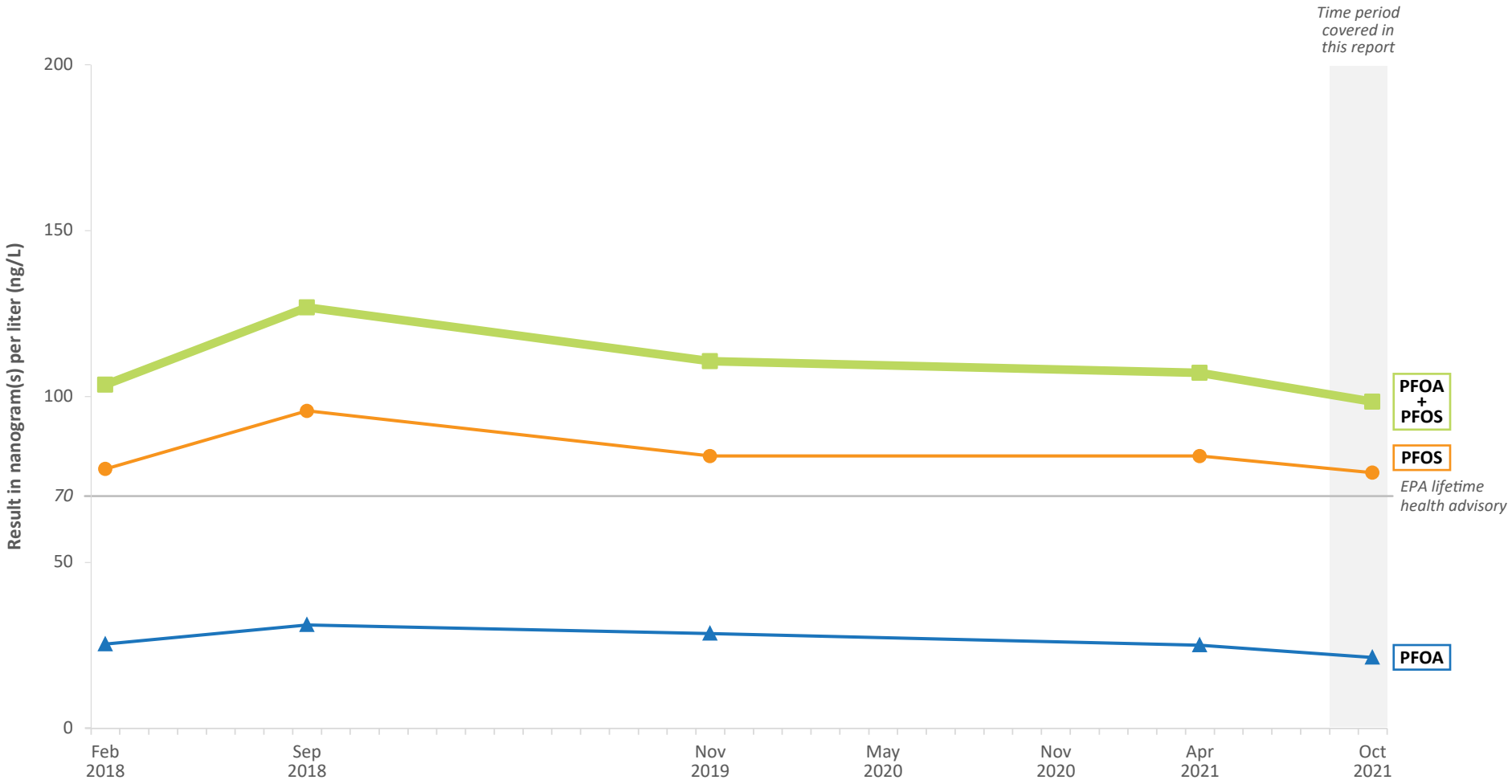


Figure A4-47.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW08
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

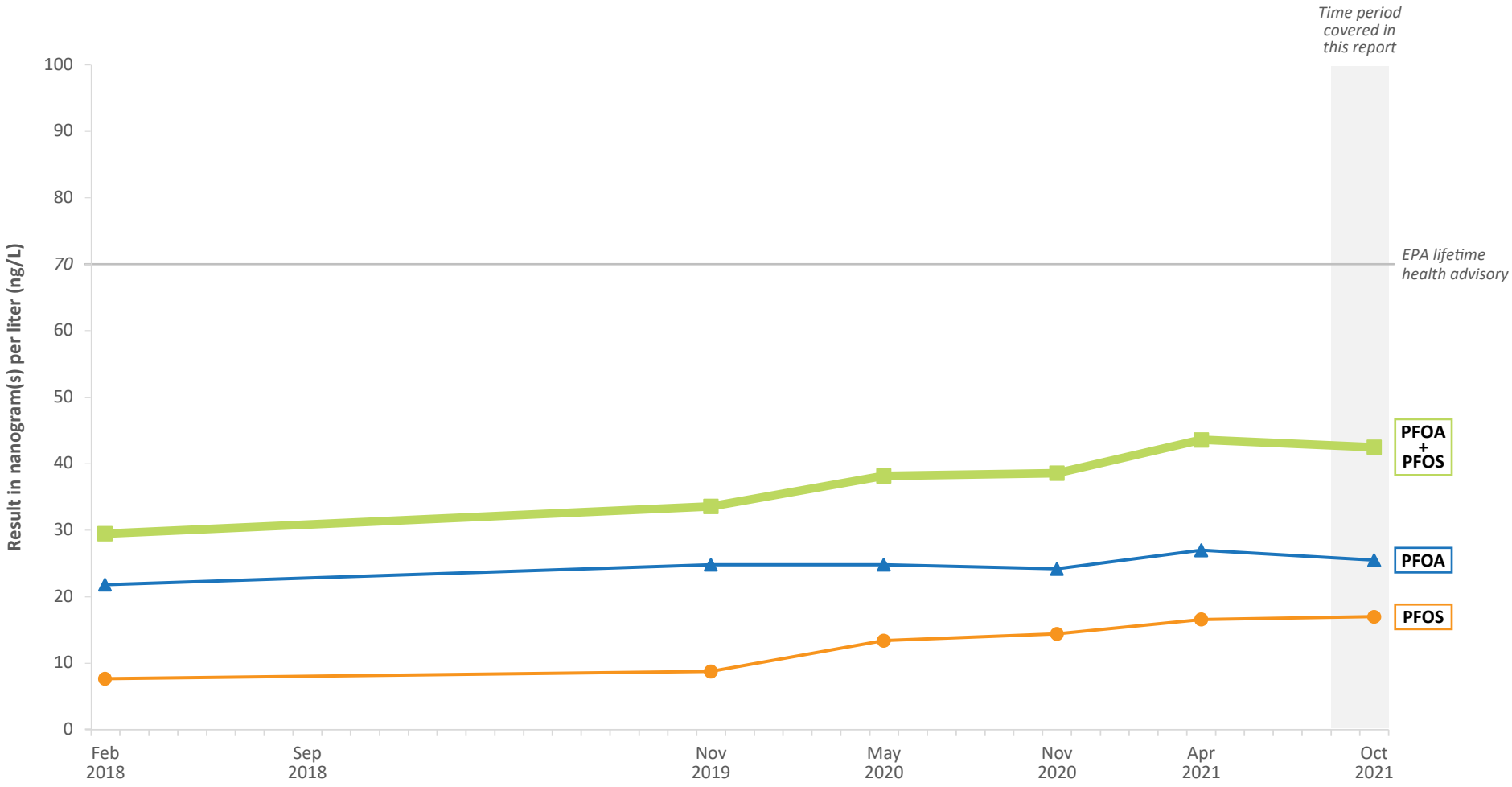


Figure A4-48.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW14
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

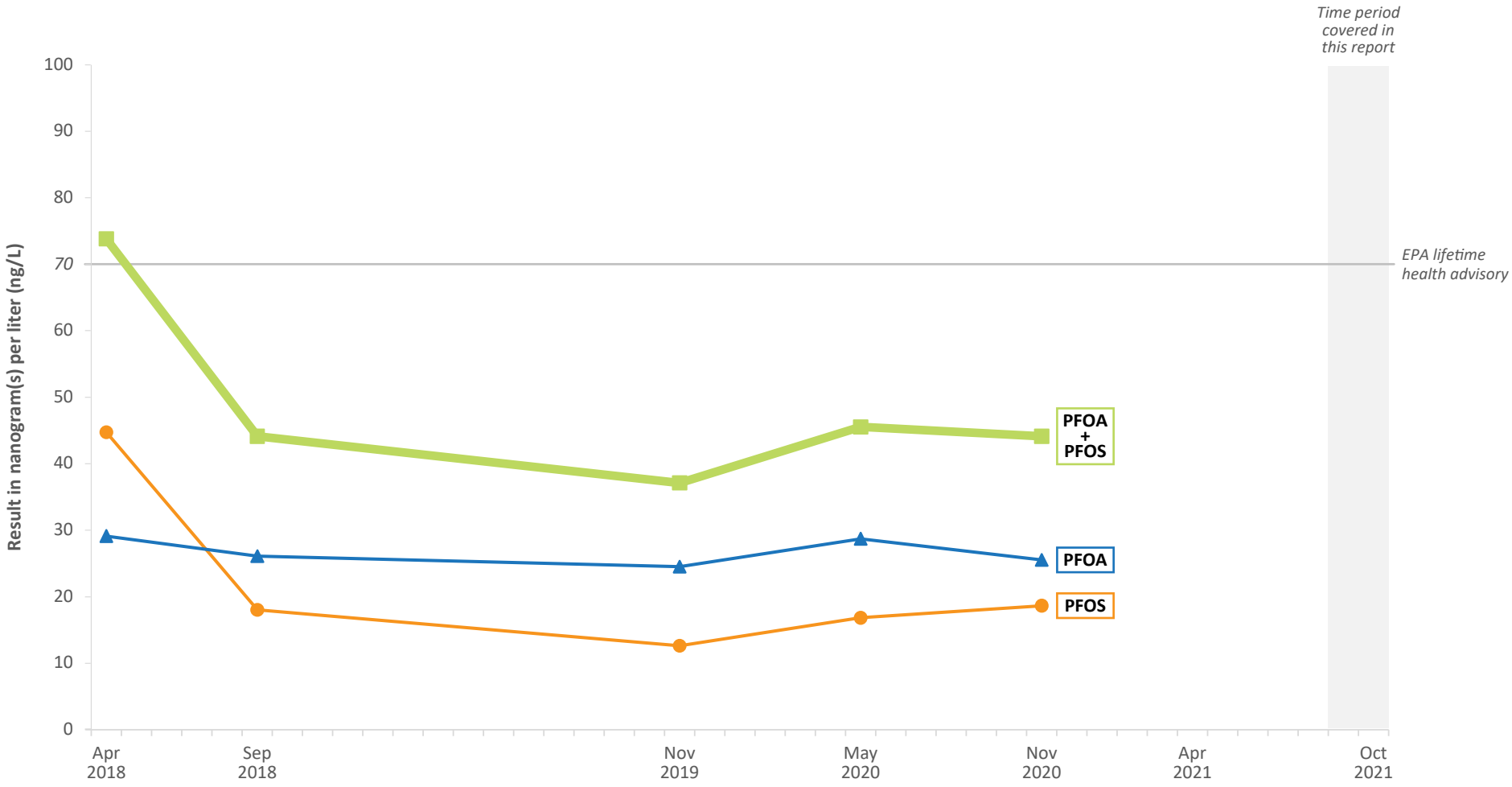


Figure A4-49.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW18
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

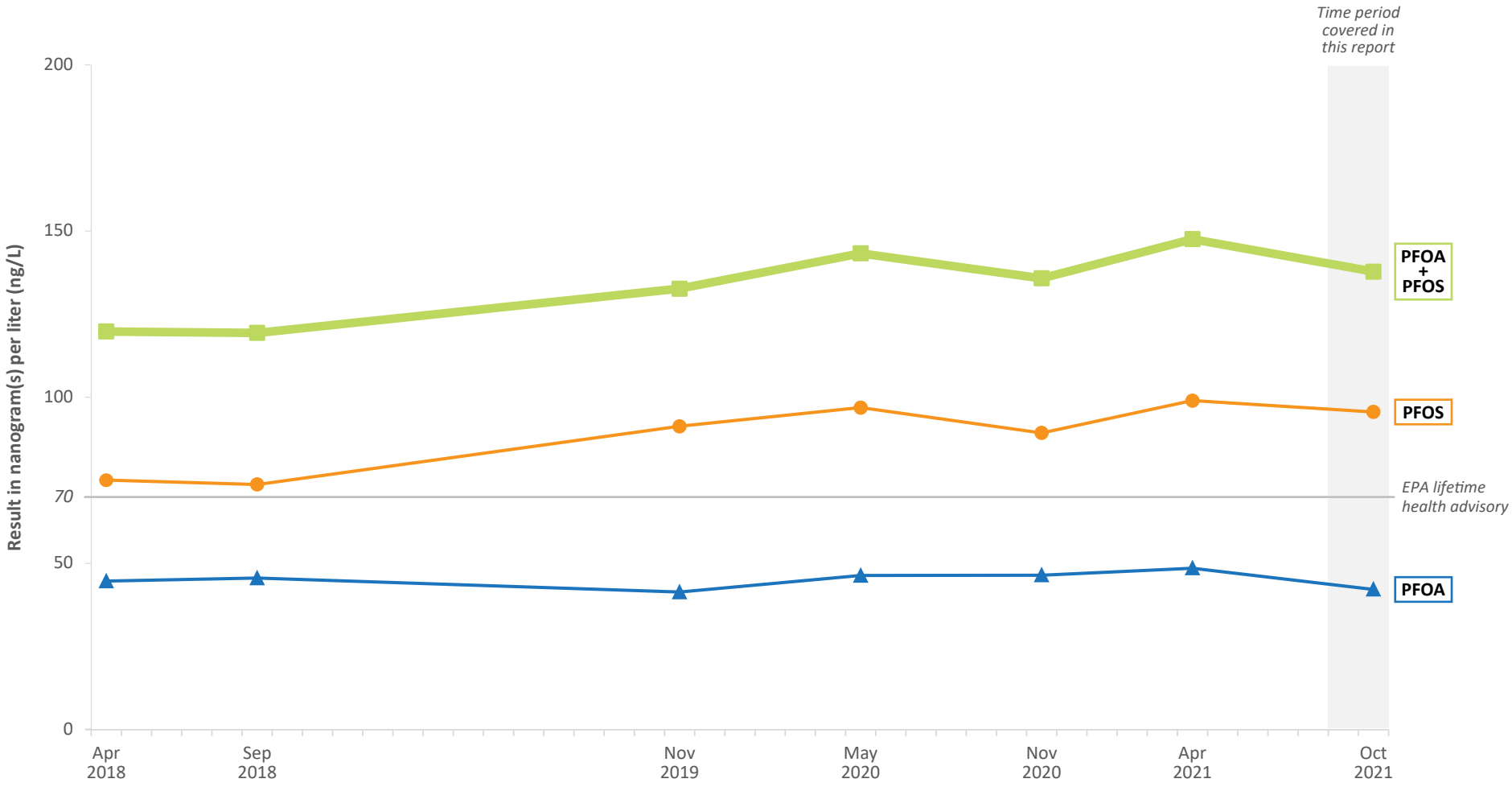


Figure A4-50.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW19
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

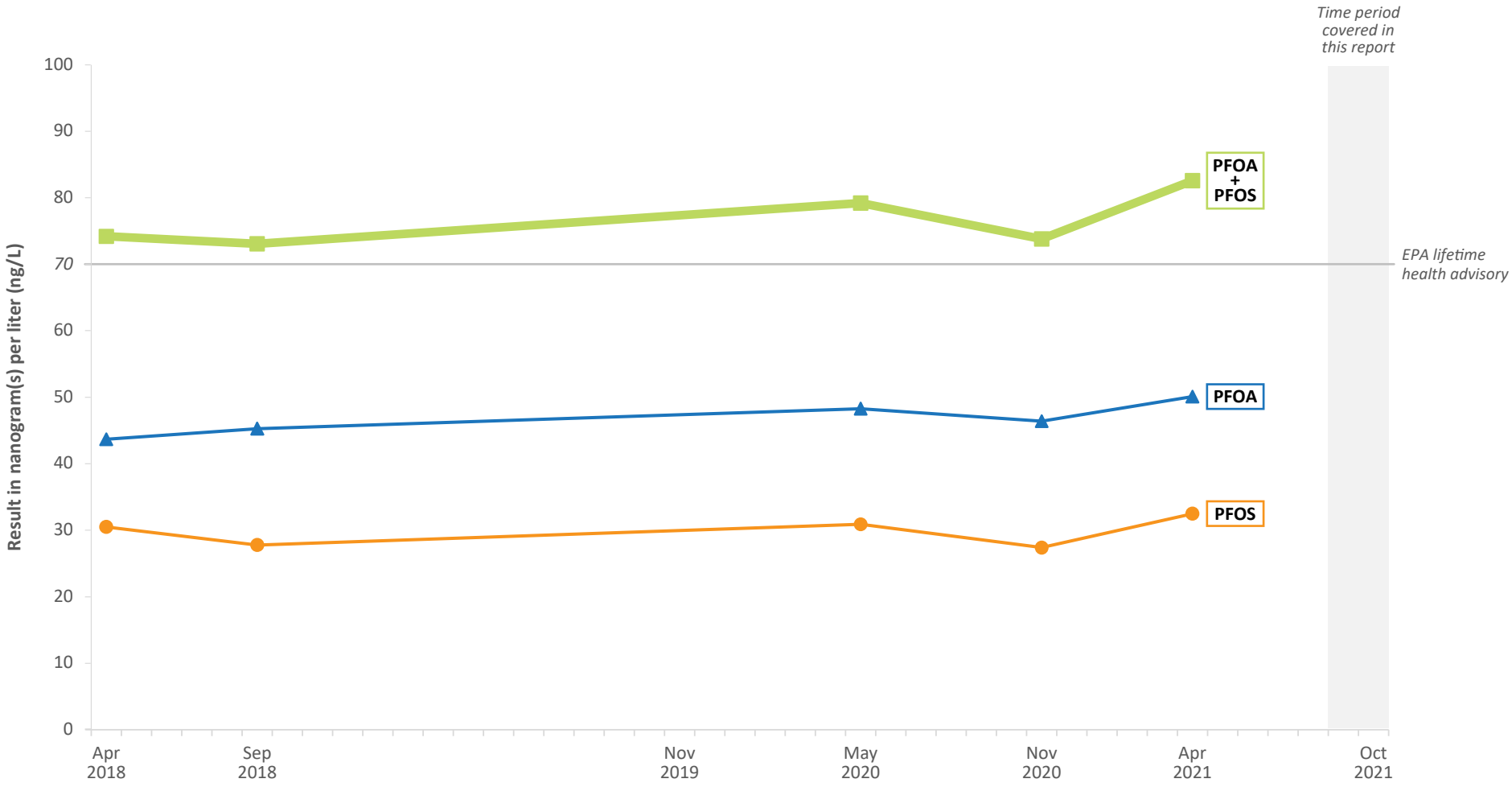


Figure A4-51.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW20
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

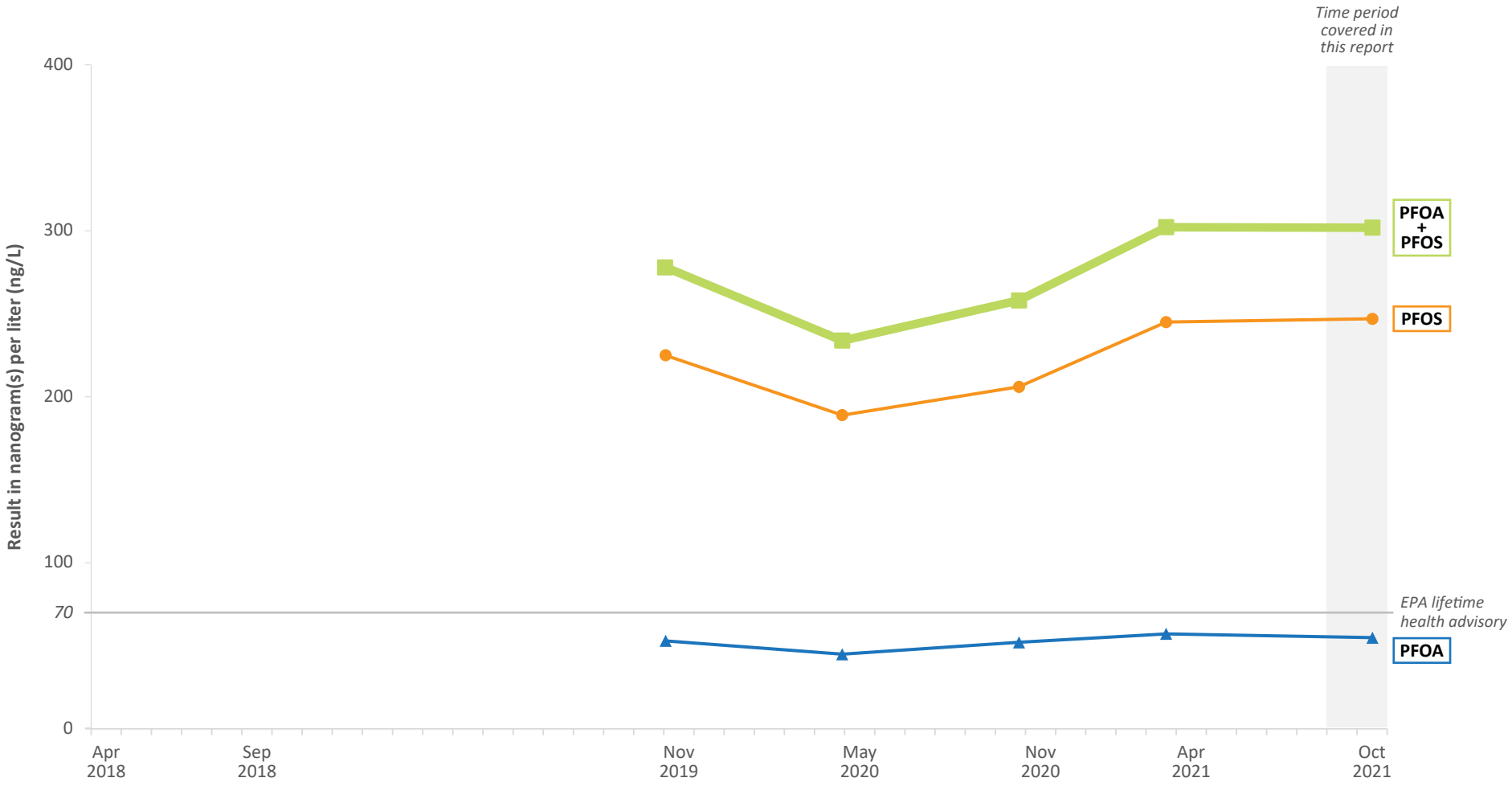


Figure A4-52.
PFOS and PFOA in Drinking Water at Sample Location WI-A06-RW24
Naval Air Station Whidbey Island
Coupeville, Washington

Note:
1. The U.S. Environmental Protection Agency lifetime health advisory for combined PFOA and PFOS is 70 nanograms per liter.

Attachment 5
Mann-Kendall Trend Evaluation

Trend Evaluation

The Mann-Kendall test (Mann 1945; Kendall 1975; Gilbert 1987) is a statistical test widely used for the analysis of trend in the environmental sciences. The test is a nonparametric procedure used to assess if there is a monotonic upward or downward trend of the variable of interest over time. A monotonic upward (downward) trend means that the variable consistently increases (decreases) through time, but the trend may or may not be linear. The data values are evaluated as an ordered time series. Each data value is compared to all subsequent data values. Thus, the test can be viewed as a nonparametric test for zero slope of the linear regression of time-ordered data versus time, as illustrated by Hollander and Wolfe (1973, p. 201).

The Mann-Kendall test compares the relative magnitudes of sample data rather than the data values themselves. One benefit of this is that the data need not conform to any particular distribution. Additionally, the test has a low sensitivity to abrupt breaks due to nonhomogeneous time series. Data reported as nondetects can be included by assigning them a common value that is less than the smallest measured value in the data set (USEPA 2009).

The Mann-Kendall test statistic (S) is found by counting the number of "concordant observations", where the later-in-time observation has a larger value for the series, and subtracting the number of "discordant observations", where the later-in-time observation has a smaller value for the series. This is done for all pairs of observations in the data set. The total difference is denoted S. Positive values of S indicate an increase in constituent concentrations over time, whereas negative values indicate a decrease in constituent concentrations over time. The strength of the trend is proportional to the magnitude of the S (i.e., the larger the absolute value of S, the stronger the evidence for a real increasing or decreasing trend).

The null hypothesis in the Mann-Kendall test assumes that there is no trend (the data are independent and randomly ordered) and this is tested against the alternative hypothesis, which assumes that there is a trend. The calculated probability (p-value) of the test represents the probability that any observed trend would occur purely by chance (given the variability and sample size of the data set). A significance level of 0.05 (i.e., 95 percent confidence) was used to test the null hypothesis that there is no trend in the data. The significance level is the probability that a test erroneously detects a trend when none is present. Only p-values less than 0.05 indicate a statistically significant trend. The result could be a significantly increasing or decreasing trend, or a nonsignificant result (no trend).

To gauge the magnitude of the trend, the Theil-Sen slope was calculated for wells exhibiting a statistically significant trend in constituent concentrations. Although nonparametric, the Theil-Sen slope estimator does not use data ranks but rather the concentrations themselves. The method is nonparametric because the median pairwise slope is utilized, thus ignoring extreme values that might otherwise skew the slope estimate. Consequently, the Theil-Sen line estimates the change in median concentration over time and not the mean as in linear regression. The Theil-Sen method handles nondetects in the same manner as the Mann-Kendall test; it assigns each nondetect a common value less than any detected measurement (USEPA 2009). Unlike the Mann-Kendall test, however, the actual concentration values are important in computing the slope estimate in the Theil-Sen procedure. Therefore, the approach is not appropriate when more than 50 percent of the concentration measurements are nondetects (ITRC 2013).

Where there was insufficient evidence for identifying a significant, non-zero trend at the 95 percent confidence level, concentrations were deemed stable if the coefficient of variation (CV) was less than 1.0. The CV is recognized as an acceptable measure of intrinsic variability in positive-valued data sets (USEPA 2009) and can be used as an indication of stability. The CV is a relative measure of variation described by the ratio of the sample standard deviation to the sample mean. Values less than or near 1.0 indicate that the data form a relatively close group about the mean value. Values larger than 1.0 indicate that the data show a greater degree of scatter about the mean. It should be noted that the CV is a relative measure of variation in groundwater concentration data and can be affected by the magnitude of concentration (USEPA 2009). As such, relatively higher concentrations can include significant variation while exhibiting a small CV. For nondetects, the Kaplan-Meier product-limit estimator (Kaplan and Meier 1958) was used to compute the mean and standard deviation. USEPA (2009)

recommends the use of the KM method when dealing with environmental data sets containing multiple censored observations.

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Interstate Technology & Regulatory Council (ITRC). 2013. *Groundwater Statistics and Monitoring Compliance: Statistical Tools for the Project Life Cycle.* GSMC-1. December.

Kaplan, E.L. and O. Meier. 1958. Nonparametric Estimation from Incomplete Observations. *Journal of the American Statistical Association*, 53, 457-481.

Kendall, M.G. 1975. *Rank Correlation Techniques, 4th ed*. Charles Griffen. London.

Mann, H.B. 1945. Nonparametric Tests Against Trend. *Econometrica*, 13, 245-259.

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Attachment 6
Trend Analysis Figures


Technical Memorandum
Results of Investigation of Per- and Polyfluoroalkyl Substances in Off-Base Drinking Water—Ault Field, Area 6, and Outlying Landing Field Coupeville
Naval Air Station Whidbey Island
Washington

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