

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island, Oak Harbor, Washington

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Introduction

CH2M HILL, Inc. (CH2M) was contracted by Naval Facilities Engineering Command (NAVFAC) to:

- Determine the presence or absence of per- and polyfluoroalkyl substances (PFAS) and PFAS precursors in on-Base groundwater at Naval Air Station (NAS) Whidbey Island Area 6.
- Evaluate the distribution of PFAS in off-Base drinking water and groundwater (if detected on-Base).
- Evaluate the distribution of known on-Base contaminants 1,4-dioxane and vinyl chloride in off-Base drinking water and groundwater.

Area 6 is part of NAS Whidbey Island Ault Field, located at the northern end of Whidbey Island along the shoreline of the Strait of Juan de Fuca just north of Oak Harbor, Washington (Figure 1). This technical memorandum (TM) presents the results of the groundwater and drinking water investigation, which was performed in three stages between December 2017 and April 2019. Work was performed in accordance with the Sampling and Analysis Plan, Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement, Area 6, Ault Field, Naval Air Station Whidbey Island, Oak Harbor, Washington (SAP) (CH2M, 2017a) and the Sampling and Analysis Plan Addendum, Site Inspection of Per- and Polyfluoroalkyl Substances and Additional Characterization of 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water for Remedial Design Refinement, Area 6, Ault Field, Naval Air Station Whidbey Island, Oak Harbor, Washington (CH2M, 2018). CH2M prepared this TM under the NAVFAC, Comprehensive Long-term Environmental Action—Navy 9000 Contract N62470-16-D-9000, Contract Task Order 4041.

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 Department of the Navy's (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 present in other industrial and household materials, 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. Once these compounds are released to the environment, they break down very slowly. PFAS are considered "contaminants of emerging concern," which have no Safe Drinking Water Act regulatory standards or routine water quality testing requirements. The 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 either groundwater or drinking water.

USEPA issued the third Unregulated Contaminant Monitoring Rule (UCMR3)¹ in May 2012. The UCMR3 required monitoring between 2013 and 2015, for 30 substances of all large public water systems (PWSs) serving more than 10,000 people and 800 representative PWSs serving 10,000 or fewer people. Six PFAS compounds were included in the UCMR3 contaminant list; of these six PFAS, USEPA issued health advisories² for only two, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), and has published toxicity values for another, perfluorobutane sulfonate (PFBS). Health advisory levels are not regulatory standards. They are health-based concentrations, which 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 Advisory level is 70 parts per trillion (ppt) for PFOS and 70 ppt for PFOA. When both PFOS and PFOA are found in drinking water, the combined concentration should not exceed 70 ppt (USEPA, 2016a and 2016b).

Navy Policy

The Navy issued a policy in 2014 (Navy, 2014) requiring on-Base drinking water sampling for PFOA and PFOS for bases where groundwater was used as drinking water and PFAS could have been released nearby in the past. Under the policy, all installations not previously tested under UCMR3 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, 2016a) that required all Navy bases not previously tested under UCMR3 or the 2014 policy (Navy, 2014) to test their finished drinking water, regardless of the water source (on-Base or municipal) or potential and known source of a PFAS release to the environment. The Ault Field water supply comes from the drinking water treatment plant facility at Mount Vernon 16 miles to the northwest, which is owned and operated by the City of Anacortes. Water from the Skagit River is pumped into the Mount Vernon water treatment plant and transported to NAS Whidbey Island via a pipeline. The City of Oak Harbor's drinking water supply (which is also supplied by the Anacortes water treatment plant) was sampled for six PFAS compounds under UCMR3 in 2013 and 2014. The results were nondetect for the six PFAS analyzed.

In June 2016, the Navy also issued a policy (Navy, 2016b) to identify and prioritize sites for investigation of drinking water resources, on- or off-Base, that are thought to be vulnerable to PFAS contamination from past Navy releases of PFAS, with a focus on releases 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 in Island County, Washington, included the Ault Field Runway Ditches/Former Runway Fire Training School (Areas 16/31) and Outlying Landing Field (OLF) Coupeville. The Navy has sampled more than 200 drinking water wells downgradient from Ault Field and OLF Coupeville since November 2016. A routine, semi-annual drinking water sampling program is currently in place for drinking water wells with exceedances of the Lifetime Health Advisory level and surrounding parcels under the Sampling and Analysis Plan Investigation of Per- and Polyfluoroalkyl Substances in Drinking Water Ault Field and Outlying Landing Field Coupeville (Off-Base Drinking Water SAP) (CH2M, 2017b). As will be discussed in subsequent sections of this TM, although Area 6 was not identified as a Priority 1 site for PFAS investigation, its history as a municipal and industrial waste disposal facility is consistent with possible releases of PFAS.

Conceptual Site Model

This section presents a brief history of Area 6, background information about the site, a description of the environmental setting, and an evaluation of drinking water sources in the vicinity. This information comprises the

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 contaminants to be monitored by PWSs.

USEPA issued a Lifetime Health Advisory level for PFOS and PFOA in May 2016, superseding the 2009 provisional health advisory. USEPA has not issued a health advisory for any other PFAS.

conceptual site model, which describes the relationship between potential contaminant sources and receptors through potential or actual migration and exposure pathways.

Site Description

Area 6 is a 260-acre tract in the southeastern corner of Ault Field. 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 (**Figure 2**). Privately-owned forested or logged land, and a former commercial sand and gravel quarry operation, are located immediately west of Area 6. Various businesses such as auto repair shops, an auto salvage yard, storage facilities, the Auld Holland Inn, and a mobile home park are located west and south of Area 6. Private residences are located to the east, west, and south of Area 6.

Site History and Current Status

There are two areas within Area 6 where wastes are known to have been disposed:

- The former industrial waste disposal area: This feature consisted of an acid disposal pit and an oily sludge pit (Foster, 2002). The acid disposal pit received approximately 300,000 to 700,000 gallons of acids, caustics, and solvents between the 1970s and 1980s. The oily sludge pit received approximately 100,000 to 600,000 gallons of liquid sludge between 1969 and the mid-1970s.
- The Area 6 landfill: This feature included 23 cut-and-fill trenches with native materials in between and received Navy waste from 1969 through the mid-1990s (Foster, 1997; URS, 1993; URS-AECOM, 2018). The landfill received both sanitary solid and industrial wastes (which may have contained hazardous constituents) from 1969 to 1983, Navy waste through 1992, yard waste and construction debris during 1993, and soil and sediments classified as nonhazardous (from other remedial actions) in 1995 and 1996 (Foster, 1997 and URS, 1993). There is no known disposal of regulated wastes since 1983 (URS, 1993).

The 1993 Record of Decision (ROD) identified trichloroethene (TCE), 1,1,1-trichloroethane (TCA), 1,1-dichloroethane (DCA), 1,1-dichloroethene (DCE), cis-1,2-DCE, and vinyl chloride as chemicals of concern (COCs) in groundwater (Navy, Ecology, and EPA, 1993). The conclusions of the associated risk assessment were that future migration of COCs in groundwater posed the greatest potential risk to human health. Remedial actions implemented following the 1993 ROD focused on minimizing the leaching of contaminants from the vadose zone to the groundwater system and capture/treatment of contaminated groundwater. In 2003, 1,4-dioxane was identified in groundwater at Area 6. The subsequent Focused Feasibility Study (URS-AECOM, 2018) listed the COCs that are part of a ROD Amendment as: TCE, 1,1-DCE, 1,1,1-TCA, vinyl chloride, and 1,4-dioxane. The ROD Amendment was finalized in 2019 (Navy, 2019).

The Area 6 landfill cap was constructed as part of the remedial action to prevent infiltration through the landfill that may result in leaching of contaminants to groundwater (Foster, 1997). An interim soil removal action was completed in 2001 at the former industrial waste disposal area to reduce the mass in the vadose zone source area; however, confirmation samples indicate that concentrations of TCE in soil between 0.21 and 8.2 ppm (21 to 8,200 ppb) remain in place post-excavation (Foster, 2002).

VOCs in groundwater, excluding 1,4-dioxane, are currently being treated with a groundwater extraction, treatment, and recharge (GETR) system constructed in 1995 (Sealaska, 2018). Currently, effluent from the GETR is discharged to land surface on the southern side of the Area 6 composting facility (**Figure 3**). The effluent flows to the north, following a natural surface water drainage, ultimately discharging to a swale north of Ault Field Road. The GETR system was not designed to treat 1,4-dioxane because the 1,4-dioxane was not identified in the groundwater until 2003. As such, 1,4-dioxane has been redistributed in the aquifer system via discharge of GETR effluent upgradient of the Area 6 source areas and subsequent infiltration to the groundwater system. An expansion and upgrade to the GETR is currently under development and will incorporate an advanced oxidation unit that will remediate both vinyl chloride and 1,4-dioxane (CTI-URS, 2017 and 2018).

EVALUATION OF PER- AND POLYFLUOROALKYL SUBSTANCES, 1,4-DIOXANE, AND VINYL CHLORIDE IN GROUNDWATER AND DRINKING WATER, AULT FIELD, AREA 6, NAVAL AIR STATION WHIDBEY ISLAND, OAK HARBOR, WASHINGTON

Currently, the only structures at Area 6 are a groundwater treatment plant (URS, 2015) and a compost facility. Other site features include an approximately 40-acre engineered landfill cap, a stormwater detention basin, and various groundwater monitoring and extraction wells.

The off-Base land surrounding Area 6 is used for a combination of residential and commercial purposes. The City of Oak Harbor's primary source of water is through the City of Anacortes, which extracts and treats water from the Skagit River. There are also private and community drinking water wells downgradient and cross gradient of Area 6.

Physical Setting

Whidbey Island lies within the Puget lowland, a topographic and structural depression between the Olympic Mountains and the Cascade Range.

Four glacial units have been identified at Area 6 and include, from youngest to oldest:

- Vashon Recessional Outwash (thin and discontinuous layer of sand and gravel with some silt; unit only
 present in the eastern part of Area 6 at the ground surface overlying the Vashon Till [CTI-URS, 2018]), which is
 interpreted as being predominantly unsaturated in Area 6 based on published cross-sections (URS-AECOM,
 2018).
- Vashon Till (laterally extensive layer of silty, fine sand with some gravel, containing localized layers of clay or silt typically present at ground surface).
- Vashon Advance Outwash (coarse, gravelly sand that gradually becomes finer grained with depth with local layers of silty sand, silt, or clay).
- Whidbey Formation Units 1 through 4 (alternating finer-grained and coarser-grained materials).

Figure 4 presents a north-south cross-section through Area 6 illustrating the relative thicknesses and vertical locations of the units. More detailed descriptions of the units can be found in CTI-URS, 2018 and URS Consultants (URS), 1993.

The United States Geological Survey has identified up to five major hydrostratigraphic units (aquifers) above bedrock in Island County, where NAS Whidbey Island is located (Jones, 1985; Sapik et al., 1988). The existing aquifer units are composed of sand or sand and gravel, while the adjacent confining layers are composed of till, glaciomarine drift, or nonglacial clay and silt. Perched, saturated zones may exist locally above noncontinuous areas of till or other clay-rich units.

The following three of these five upper aquifers have been identified at Area 6 (CTI-URS, 2018):

- The shallow aquifer is an unconfined groundwater unit found in the Vashon Advance Outwash beneath Area 6. The former industrial waste disposal area discharged directly into this unit.
- The intermediate aquifer is a moderately continuous groundwater body found in the sandy unit that corresponds to the Whidbey Formation Unit 2. Near Area 6, this aquifer is confined below the silt and clay of Whidbey Formation Unit 1, which acts as an aquitard.
- The deep aquifer is also a nearly continuous confined groundwater body found near Area 6. This aquifer is confined below the silt and clay of Whidbey Formation Unit 3 (which acts as an aquitard) and occupies a thick sand layer in Whidbey Formation Unit 4.

Based on potentiometric maps presented in the Annual 2017-2018 Groundwater Long-Term Monitoring Report (Sealaska, 2018), the groundwater flow direction in the Vashon Advance Outwash (shallow aquifer) underlying Area 6 is predominantly to the south. There is a potential local southwesterly component of groundwater flow in the northwestern corner of Area 6. Groundwater flow direction in the Whidbey Formation Unit 2 (intermediate aquifer) is predominantly to the southeast; however, measurements from a subset of Area 6 monitoring wells (6-I-01, 6-I-03, and 6-I-08) suggest a local component of groundwater flow to the northeast (URS, 1993).

Groundwater elevation data from wells completed in the Whidbey Formation Unit 4 (deep aquifer) suggest groundwater flow directions ranging from southeast to southwest (URS, 1993). Downward vertical hydraulic gradients exist at the site, with differences in groundwater elevations between the shallow and intermediate aquifer ranging from 5 to 20 feet and approximately 50 feet between the shallow and deep aquifer. The majority of monitoring infrastructure at Area 6 is completed within the shallow aquifer.

There is limited readily available information regarding the subsurface characteristics of the off-Base area surrounding Area 6. Regionally, Whidbey Island consists of a thick sequence of glacial and interglacial deposits overlying lower permeability bedrock. The relatively continuous lithologic/hydrostratigraphic units described above likely extend off-Base.

Contaminant Setting

Source Areas

1,4-dioxane and volatile organic compound (VOC) source areas include the former industrial waste disposal area and the Area 6 landfill. AFFF has historically been used at Ault Field (Area 31, Area 16) and OLF in Coupeville (CH2M, 2016), resulting in the presence of PFAS in groundwater downgradient from these areas. Although it is unknown whether AFFF was used or disposed of at Area 6, the historical site use as a disposal area suggests that it is feasible. Examples of potential PFAS-containing materials disposed at Area 6 include sediment excavated from NAS Whidbey Island runway ditch system within the Area 6 landfill in 1995 before construction of the cap (Foster, 1997) and wastes excavated as part of remedial actions at other NAS Whidbey Island sites (such as the Clover Valley Fire School [Sealaska, 2015]).

Nature and Extent

Previous investigations at NAS Whidbey Island have confirmed the presence of 1,4-dioxane and VOCs in groundwater exceeding project action levels (PALs). The 2019 ROD Amendment (Navy, 2019) included the following COCs:

сос	Remediation Goal (RG)	PALs
TCE	5 ppb	NA
1,1,1-TCA	200 ppb	NA
1,1-DCE	7 ppb	NA
Vinyl Chloride	0.029 ppb	0.29 ppb ^a and 2 ppb ^b
1,4-dioxane	0.44 ppb	$0.44~ppb^a$ and $35~ppb^b$

Notes:

- ^a PAL for the purposes of groundwater contaminant plume delineation.
- b PAL for the purposes of decision making regarding providing alternate drinking water sources.

The presence of PFAS in groundwater at Area 6 was unknown before conducting this investigation. The results of routine groundwater monitoring at Area 6 suggest the presence of two groundwater 1,4-dioxane and VOC plumes at Area 6 (Sealaska, 2018). The first plume is referred to as the western groundwater plume, which originates from the former industrial waste disposal area (**Figures 5** and **6**). Contaminants detected at concentrations exceeding risk levels in the western groundwater plume included 1,4 dioxane and multiple VOCs including TCE, 1,1,1-TCA, 1,1-DCE. The second plume is referred to as the southern groundwater plume which originates from the capped Area 6 landfill (**Figures 5** and **6**). Although the extent of these individual plumes is distinguishable for other COCs (Sealaska, 2018), the western and southern 1,4-dioxane plumes are comingled (**Figure 6**). The most recent interpretations of the groundwater plumes suggest that vinyl chloride and 1,4-dioxane have migrated off-Base at concentrations exceeding the respective PALs, that the off-Base extent of 1,4-dioxane has not been

delineated to the west or south, and that the interpretation of the off-Base extent of vinyl chloride is based on limited data (**Figures 5 and 6**) (Sealaska, 2018).

With respect to the vertical distribution of VOCs in the aquifer system, the 1993 Remedial Investigation (RI) Report (URS, 1993) concluded that the majority of groundwater contamination (COCs exceeding the respective screening level) was present in the shallow aquifer. Concentrations of detected COCs in the intermediate aquifer were either infrequent or near the detection limit; therefore, the presence in groundwater could not be confirmed. Subsequent sampling of intermediate aquifer wells between 1994 and 2006 has yielded similar results (nondetected results with limited reporting limits exceeding the screening levels for vinyl chloride, 1,1-DCE, TCE, and 1,4-dioxane). Results of remedial investigations in 1991 concluded that the deep aquifer had not been impacted by operations at Area 6 (Navy, Ecology, and USEPA, 1993). Detected concentrations at one deep monitoring well (6-D-04) were found to be the result of leaky casing joints allowing for groundwater from the shallow aquifer to enter the well. The well was subsequently pumped (to capture groundwater that leaked from the shallow aquifer) and abandoned. Groundwater samples for COCs have not been collected from deep aquifer monitoring wells since 1991 and 1,4-dioxane has not been analyzed in deep aquifer monitoring well samples. The current long-term groundwater monitoring program is focused on the shallow aquifer (Sealaska, 2018).

Transport Pathways and Receptors

Potential contaminant transport pathways and receptors at and near Area 6 include:

- Leaching of PFAS, VOCs, and/or 1,4-dioxane currently or historically present in the former industrial waste disposal area and/or the Area 6 landfill from soil and/or waste to groundwater.
- Transport via advection and dispersion in groundwater.
- Contaminated groundwater captured by GETR, released via GETR effluent to ground surface, transported north in surface water, and re-infiltrated to the underlying groundwater system.
- Ingestion by current and future users of drinking water wells in areas near Area 6.

Summary of Field Activities

This section provides a summary of field investigation activities and a summary of sampling activities conducted as part of the Area 6 field investigation in three stages: (1) on-Base groundwater monitoring well and GETR sampling, (2) Phase 1 off-Base drinking and groundwater well sampling, and (3) Phase 2 off-Base drinking and groundwater well sampling. All field activities were conducted in accordance with the standard operating procedures (SOPs) outlined in the SAP (CH2M, 2017a) and SAP Addendum (CH2M, 2018). Sample collection from private drinking water and groundwater wells was conducted only at parcels where permission to collect samples was granted by the owner.

On-Base Groundwater Monitoring Well and Treatment System Sampling

The first stage of the Area 6 field investigation included sampling 13 existing, on-Base groundwater monitoring wells and the GETR influent and effluent, to determine whether PFAS is present in groundwater underlying the site. The fieldwork was conducted in December 2017, with samples being submitted for laboratory analysis of PFAS and PFAS precursors. Because the on-Base extents of VOCs and 1,4-dioxane are evaluated through the semi-annual monitoring program, these constituents were not analyzed during this stage of the investigation.

Before groundwater quality sampling, a synoptic groundwater level gauging event was performed on December 4 and 5, 2017. Manual depth to groundwater and total well depth measurements were recorded for the wells included in the on-Base sampling investigation. Measurements were collected in accordance with the SOP for water level measurement. Area 6 groundwater monitoring well locations are presented on **Figure 7** and manual groundwater level measurements are presented in **Table 1**.

Groundwater quality and GETR samples were collected between December 5 and 12, 2017. Groundwater monitoring well samples were collected under low-flow and low-stress conditions, with the sample pump intake placed at approximately the middle of the well screen interval. In accordance with the SAP, the pumps used were Geotech PFAS-free bladder pumps. Because of the relatively remote access to well P-4 (north of Ault Field Road), this well was sampled via a PFAS-free bailer. Approximately one well volume of water was removed from the P-4 before sample collection. GETR influent and effluent samples were collected directly from sample ports at the Area 6 groundwater treatment plant.

For wells purged and sampled via low-flow procedures, depth-to-water readings and water quality parameters (WQPs) (specific conductance, pH, turbidity, temperature, dissolved oxygen, and oxidation-reduction potential [ORP]) were measured and recorded approximately every 5 minutes before sampling using a water quality meter that was calibrated daily (at a minimum).

WQPs were considered stabilized if the following criteria were met for three consecutive readings:

- Temperature remained constant
- pH was within 0.1 pH units
- Conductivity was within 10 percent
- Turbidity measurements were less than 10 nephelometric turbidity units or agreed within 10 percent
- ORP
- Dissolved oxygen within 0.2 milligrams per liter

Groundwater sample locations are shown on **Figures 8 and 9**. Stabilized WQPs recorded before sample collection are presented in **Table 2**. Depth-to-water, WQPs, and sample collection information were recorded on groundwater monitoring well and GETR sampling data sheets included in **Attachment 1**.

During sample collection, sample containers were filled in such a manner so as to minimize aeration of the samples. Quality control (QC) samples were collected at a rate of one field duplicate sample for every 10 samples and one matrix spike and matrix spike duplicate sample for every 20 samples collected. One equipment rinsate blank sample was collected each day of sampling from decontaminated equipment.

Groundwater samples were shipped on ice under chain-of-custody protocols to Vista Laboratories in El Dorado Hills, California, a Department of Defense-accredited laboratory. Groundwater samples were analyzed for PFAS via Liquid Chromatography Mass Spectrometry and Tandem Mass Spectrometry (LCMSMS) Compliant with Quality Systems Manual (QSM) 5.1 Table B-15 14 PFAS were reported, consistent with the USEPA drinking water method (Method 537 Revision 1.1), which was current at the time of sampling (PFOA, PFOS, PFBS, and 11 other PFAS compounds). To inform the design for the planned Area 6 GETR upgrade (which includes addition of an oxidation treatment step), groundwater samples were submitted for evaluation of PFAS precursors via the total oxidizable precursor (TOP) Assay.

Phase 1 Off-Base Drinking Water and Groundwater Sampling

As will be discussed in the subsequent section "Summary of Sample Results", PFAS was detected in samples collected from on-Base groundwater monitoring wells and the GETR influent and effluent. As a result, the Phase 1 off-Base groundwater and drinking water investigation was implemented. The Phase 1 off-Base drinking water and groundwater sampling area was selected based on groundwater flow direction and the location of on-Base waste disposal areas. The Phase 1 sampling area extended approximately a 1/2 mile in the direction of groundwater flow to the south to southeast and a 1/2 mile west of the western Area 6 boundary (**Figures 10** through **12**). The Phase 1 sampling area included approximately 280 properties and 15 off-Base groundwater monitoring wells. To address stakeholder concerns regarding the decision to not sample off-Base wells to the east of Area 6 (which is hydraulically cross gradient to on-Base disposal areas), 4 additional on-Base groundwater monitoring wells along the eastern Area 6 boundary were included in the Phase 1 investigation (CH2M, 2018).

The Phase 1 groundwater monitoring well sampling program was conducted between February 2018 and January 2019. Groundwater quality samples were collected from 4 additional on-Base monitoring wells along the

eastern boundary of Area 6 and 13 of the 15 off-Base monitoring wells identified in the SAP and SAP Addendum (CH2M, 2017a and 2018). Well MW-02 was not sampled because the well was not located during the investigation (it is likely paved over). Well MW-05 was not sampled because the well was dry. Groundwater samples were collected in accordance with the low-flow purging and sampling techniques described in the preceding section. Groundwater sample locations are shown on **Figures 8 and 9**. Stabilized WQPs recorded before sample collection are presented in **Table 2**. Depth-to-water, WQPs, and sample collection information were recorded on groundwater sampling data sheets included as **Attachment 1**.

A total of 20 samples (and associated field QC samples) were collected from private, off-Base drinking water and groundwater wells during the Phase 1 investigation between February and April 2018. Samples were collected in accordance with the SOP for *Drinking Water Sampling when Analyzing for PFAS*, provided in Appendix A of the SAP (CH2M, 2017a). Drinking water and private groundwater samples were collected from sample ports near the well, outside spigots, or faucets inside the home. Samples were collected directly into the appropriate bottleware. Based on information provided by residents and/or well completion logs, the majority of the off-Base, private wells sampled were completed in the shallow aquifer (approximately 100 feet in total depth or less). Three of the private wells sampled were approximately 200 to 270 feet in total depth. Off-Base drinking water and groundwater sample forms are included as **Attachment 2**.

Groundwater monitoring well, drinking water, and private groundwater well samples were submitted to Vista Laboratories for PFAS analysis. Groundwater PFAS analysis was performed using LCMSMS Compliant with QSM 5.1 Table B-15. Drinking water analysis was performed following USEPA Method 537 Revision 1.1. For both drinking water and groundwater analyses, 14 PFAS were reported (PFOA, PFOS, PFBS, and 11 other PFAS compounds), consistent with the analyte list in USEPA Method 537 Revision 1.1, which was the current drinking water method at the time of sampling. Groundwater and drinking water samples were also sent to Test America Laboratory in Seattle for analysis of vinyl chloride via Method 8260SIM and 1,4-dioxane via Method 8270SIM. Samples were collected from wells 6-S-42 and 6-S-43 and submitted for TOP Assay analysis because these wells are located within an area planned for construction of a new GETR system. Bottleware for analysis of vinyl chloride and 1,4-dioxane have Teflon-lined caps. To eliminate potential cross-contamination, PFAS samples were collected before handling bottleware for VOC and 1,4-dioxane samples and were stored in a separate cooler.

Phase 2 Off-Base Drinking Water and Groundwater Sampling

As will be discussed in the subsequent section "Summary of Sample Results", PFAS was detected in samples collected from Phase 1 off-Base drinking water and groundwater wells, with five drinking water locations southwest of Area 6 exceeding the Lifetime Health Advisory level for PFOA and/or PFOS (Figure 10). As a result, the Phase 2 off-Base groundwater and drinking water investigation was implemented. The Phase 2 Off-Base Sampling Area included approximately 375 parcels within a 1/2 mile in the direction of groundwater flow to the southwest of the exceedance area. Sample request letters were mailed to parcel owners within the Phase 2 sampling area and to parcel owners within the Phase 1 sampling area that did not respond to the Phase 1 mailing.

Two wells were sampled as part of the Phase 2 investigation. One drinking water well of unknown depth located within the Phase 1 sampling area was sampled in August 2018. One inactive groundwater well, approximately 30 feet in total depth, located within the Phase 2 sampling area was sampled in April 2019. During initial reconnaissance, the inactive groundwater well was found to be buried by vegetation and debris and was inaccessible. Sampling of the well occurred after the property owner performed extensive, planned demolition (of the home on the property) and lot clearing activities. A second inactive well located within the Phase 2 sampling area will be sampled during future investigations at Area 6.

Samples from the drinking water well were collected from an outside spigot in accordance with the sample collection and handling procedures previously described. The inactive groundwater well was purged and sampled with temporary pump equipment. The dedicated pump was removed from the well and placed on plastic sheeting. A temporary pump was installed in the well and one-casing volume of water was purged. The temporary pump was removed from the well and the well was sampled using low-flow techniques via a peristaltic pump. Following sample collection, the dedicated pump was reinstalled in the well. Because the inactive well had been

buried by vegetation and debris for many years, the property owner was advised that it is recommended that the well be redeveloped and disinfected (depending on the planned use) before putting the well in service. Drinking water and private groundwater well sampling forms are included in **Attachment 2**.

Groundwater monitoring well, drinking water, and private groundwater well samples were submitted to Vista Laboratories for PFAS and to Test America Laboratory in Seattle for analysis of vinyl chloride and 1,4-dioxane.

In addition to collection of samples in support of the investigation prescribed in the Area 6 SAP (CH2M, 2017a) and SAP Addendum (CH2M, 2018), a second round of sampling at drinking water wells with PFOS and/or PFOA exceedances of the Lifetime Health Advisory level was conducted in August and September 2018 in support of the Engineering Evaluation/Cost Analysis (EE/CA) Long-term Solutions for Ault Field and Area 6 Drinking Water (CH2M, 2020). During this period, samples were collected from five drinking water wells in accordance with the collection and handling procedures previously described. Samples were submitted to Vista Laboratories and/or Test America Laboratory for analysis of PFAS, alkalinity (Method 2320B), total dissolved solids (Method 2540C), total suspended solids (Method 2540D), anions (USEPA 300.0), ammonia (Method 350.1), nitrate/nitrite (Method 353.2), phosphate/orthophosphate (Method 365.1), cations (Method 6010C), and dissolved organic carbon (Method 9060).

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 the shipping coolers provided by the laboratories. The coolers were then packed with ice. The completed chains-of-custody, provided in **Attachment 3**, were included in the coolers. The coolers were shipped via FedEx overnight to the laboratories.

Investigation-derived Waste Management and Disposal

Wastes generated during the field activities were characterized as investigation-derived waste (IDW) and managed in accordance with the SAP, Waste Management Plan/Environmental Management Plan, and applicable SOPs. Solid IDW generated from temporary sample tubing and personal protective equipment, as well as liquid IDW (purge water and decontamination water from groundwater monitoring well sampling) were stored in 55-gallon stainless steel drums placed on a wooden pallet with secondary containment. Liquid IDW was sampled for waste characterization and analyzed for PFAS, VOCs, semivolatile organic compounds (SVOCs) (including low-level analysis for 1,4-dioxane), polyaromatic hydrocarbons, total Resource Conservation and Recovery Act of 1976 metals plus copper, nickel, and zinc, reactivity, and corrosivity. The solid and liquid IDW has been characterized as nonhazardous, PFAS-containing, and is not considered a dangerous waste (State of Washington Dangerous Waste Regulations WAC 173-3030). All drums have been transported off-Base for disposal.

Deviations from the Sampling and Analysis Plan

The following list summarizes deviations from the Final SAP (Navy, 2017b) and SAP Addendum (Navy, 2018b) during the site investigation activities and justification for those deviations:

- Off-Base groundwater monitoring well MW-02 was not sampled because staff were unable to locate the well, which is likely paved over.
- Off-Base groundwater monitoring well MW-05 was not sampled because the well was dry.
- One large diameter (2.5 foot) inactive, private groundwater well in the Phase 2 sampling area was not sampled because of logistical issues associated with sample collection and water management. Sampling of this location will be included in future field activities at Area 6.

Data quality and usability was not affected by these deviations.

Summary of Sample Results

This section provides a brief discussion of the project action limits. A summary of laboratory results for the groundwater and drinking water samples collected for analysis of PFAS compounds, including PFOA, PFOS, and PFBS, 1,4-dioxane, and vinyl chloride. A data validation summary and usability assessment are also provided.

Project Action Limits

As indicated in the SAP (Navy, 2017b) and the SAP Addendum (Navy, 2018b), the project action limits for this project are:

- USEPA Lifetime Health Advisory level for PFOA and PFOS: 70 ppt, unless both chemicals are detected, then 70 ppt is the Lifetime Health Advisory level for the cumulative concentration of the two chemicals.
- USEPA Regional Screening Level (RSL) for PFBS: 400,000 ppt (based on a hazard quotient = 1.0).
- PALs currently do not exist for the remaining 11 PFAS compounds. At the time of drafting this TM, there are no USEPA RSLs or any state regulatory screening levels available. Per Navy guidance at the time of this investigation, data were collected for the 14 analytes listed in USEPA Method 537 rev. 1.1.
- PFAS precursors do not have explicit screening levels, the presence or absence of the compounds were evaluated based on the pre-oxidation and post-oxidation PFAS concentrations via the TOP Assay.
- 1-4-Dioxane: Model Toxics Control Act (MTCA) Method B cleanup level (CUL) of 0.44 parts per billion (ppb) for the purposes of groundwater contaminant plume delineation. USEPA drinking water risk assessment analyses (USEPA, 2013) value of 35 ppb (modified for an excess cancer risk of 1 x 10⁻⁴) for the purposes of decision making regarding providing alternate drinking water sources.
- Vinyl Chloride: Modified MTCA Method B CUL of 0.29 ppb (modified for an excess cancer risk of 1 x 10⁻⁵) for the purposes of contaminant plume delineation. USEPA Federal maximum contaminant level of 2 ppb for the purposes of decision making regarding active treatment or providing alternate drinking water sources.

On-Base/Off-Base Groundwater Monitoring Well and On-Base Groundwater Extraction, Treatment, and Recharge Sampling Results

Tables 3 and 4 present a summary of detections and exceedances of PFAS and VOC/1,4-dioxane sample results, respectively, from 30 groundwater monitoring wells and the GETR influent and effluent. The spatial distribution of these data is shown on **Figures 8 and 9.** Comprehensive laboratory results and data validation summaries are presented in **Attachment 4**. The following is a summary of the groundwater sampling results from on- and off-Base groundwater monitoring wells and the GETR influent and effluent:

- PFBS PFBS was detected in samples from 21 locations, ranging from an estimated 2.27 ppt in the sample collected from 6-S-27, to 62.5 ppt in the sample collected from MW-01. None of the detections of PFBS exceeded the RSL of 400,000 ppt.
- PFOS PFOS was detected in samples from 5 locations ranging from an estimated 1.69 ppt in the sample collected from 6-S-28, to an estimated 5.6 ppt in the sample collected from 6-S-26. None of the groundwater monitoring well or GETR influent and effluent samples exceeded the USEPA Lifetime Health Advisory level of 70 ppt for PFOS.
- PFOA PFOA was detected in samples from 17 locations, ranging from an estimated 1.09 ppt in the sample collected from 6-I-01 to 96.9 ppt in the sample collected from 6-S-44. One sample (from 6-S-44) exceeded the Lifetime Health Advisory level of 70 ppt for PFOA. None of the GETR influent and effluent samples exceeded the USEPA Lifetime Health Advisory level of 70 ppt for PFOA.

- **PFOA** + **PFOS** The combined detections of PFOA and/or PFOS (PFOA + PFOS) ranged from 1.09 ppt in the sample collected from 6-I-O1 to 96.9 ppm in the sample collected from 6-S-44. These results include wells where both PFOA and PFOS were detected as well as locations where only one of the constituents was detected. One sample (from 6-S-44) exceeded the Lifetime Health Advisory level of 70 ppt for PFOA + PFOS. Both PFOA and PFOS were detected in samples from 3 locations, ranging from 37.9 ppt in the sample collected from 6-S-27 to 57.9 ppt in the sample collected from 6-S-26. None of the groundwater monitoring well samples in which both PFOA and PFOS were detected exceeded the Lifetime Health Advisory level of 70 ppt for PFOA+PFOS.
- Vinyl chloride As previously discussed, VOCs and SVOCs were not analyzed from groundwater monitoring
 wells sampled during the on-Base investigation in 2017 because of the known presence and extents of these
 constituents. Vinyl chloride was detected in one off-Base groundwater monitoring well, 6-S-43, at an
 estimated concentration of 1.8 ppb. This concentration exceeds the groundwater plume delineation PAL of
 0.29 ppb.
- **1,4-Dioxane** 1,4-dioxane was detected in samples from 6 locations, ranging from an estimated 0.15 ppb in the sample collected from 6-S-42 to 4.4 ppb in the sample collected from 6-S-11. Samples collected from 4 locations (6-DW-38A, 6-S-11, 6-S-12, and 6-S-43) exceed the groundwater plume delineation PAL of 0.44 ppb.

In general, PFOA was detected more frequently and at greater concentrations than PFOS in Area 6 groundwater monitoring wells and GETR influent/effluent samples (Table 3 and Figure 8). PFOA concentrations are greater in the northern portion of the site, near the former industrial waste disposal area (6-S-44) and areas influenced by the GETR effluent stream (6-S-26 and P-4), and decrease to the south. PFOS was generally detected (at lower concentrations than PFOA) in wells in the hydraulically downgradient (southern) portion of Area 6. Low-level concentrations of PFOA were detected in one of the intermediate aquifer wells (6-I-01) and from one shallow aquifer well along the eastern Area 6 boundary (6-S-02). Table 5 presents a summary of the standard PFAS analysis compared to the PFAS TOP Assay results. If significant PFAS precursors were present, it would be expected that concentrations of PFAS constituents would be greater in the "-TOP" sample results than in the standard sample results. It should be noted that the presence of 1,4-dioxane in Area 6 groundwater and GETR samples influenced the TOP Assay in that the oxidant introduced during the analysis was consumed by 1,4-dioxane rather than by precursor oxidation processes, which necessitated the laboratory to introduce more oxidant than anticipated to overcome the consumption by 1,4-dioxane. Although there are some instances where PFAS constituent concentrations are slightly greater in either the standard samples or the TOP Assay samples (for example, 6-S-44, 6-S-26 and P-4), in general PFAS concentrations are within the same order of magnitude, lending uncertainty regarding the presence of precursors in Area 6 groundwater.

Vinyl chloride and 1,4-dioxane results are summarized in **Table 4** and presented on **Figure 9**. The full suite of analytical data and data validation reports are included in **Attachment 4**. The magnitude of detected concentrations in groundwater monitoring wells and the spatial distribution of detections is consistent with the data collected as part of the semi-annual long-term groundwater monitoring program (Sealaska, 2018).

Off-Base, Private Drinking Water, and Groundwater Sampling Results

A total of 22 drinking water and/or private groundwater well samples were collected from the Phase 1 and 2 sampling areas between February 2018 and April 2019. Samples included 12 single-resident drinking water wells, 6 community drinking water wells, and 4 private groundwater wells (irrigation or inactive). All samples collected were analyzed for the 14 PFAS compounds specified in accordance with the SAP, vinyl chloride, and 1,4-dioxane. A summary of detections and exceedances are provided in **Tables 6 and 7** and are shown on **Figures 10** through **12**. Comprehensive laboratory results and data validation summaries are presented in **Attachment 5**. The following is a summary of the off-Base drinking water and private groundwater well sample results:

PFBS – PFBS was detected in samples from 10 locations, ranging from an estimated 2.27 ppt in RW12, to 68.2 ppt in RW19P. None of the detections of PFBS exceeded the RSL of 400,000 ppt.

- PFOS PFOS was detected in samples from 9 locations, ranging from an estimated 2.77 ppt in RW04 to 95.7
 ppt in RW08. Samples from three locations exceeded the Lifetime Health Advisory level of 70 ppt for PFOS at
 least once during the two rounds of sampling.
- **PFOA** PFOA was detected in samples from 10 locations, ranging from an estimated 1.03 ppt in RW12 to 57.7 ppt in RW05. None of the samples exceeded the Lifetime Health Advisory level of 70 ppt for PFOA.
- **PFOA + PFOS** The combined detections of PFOA and/or PFOS (PFOA+PFOS) ranged from an estimated 1.03 ppt in RW12 to 150.7 ppt in RW05 (19 samples from 10 locations). These results include wells where both PFOA and PFOS were detected as well as locations where only one of the constituents was detected. Twelve samples from five locations exceeded the Lifetime Health Advisory level of 70 ppt for PFOA + PFOS during the two rounds of sampling. Both PFOA and PFOS were detected in 18 samples from nine locations ranging from 6.9 ppt in RW04 to 150.7 ppt at RW05. The Lifetime Health Advisory level of 70 ppm was exceeded in 12 samples from five locations that had detections of both PFOA and PFOS.
- Vinyl chloride Vinyl chloride was detected in one off-Base drinking water well sample, RW18, at an estimated concentration of 0.014 ppb. This concentration does not exceed either the PAL for groundwater plume delineation (0.29 ppb) or the PAL for the purposes of decision making regarding active treatment or providing alternate drinking water sources (2 ppb).
- **1,4-Dioxane** 1,4-dioxane was detected in samples from five locations, ranging from an estimated 0.053 ppb in RW05 to 0.26 ppb in RW08. None of the detected concentrations exceeded the PAL for groundwater plume delineation (0.44 ppb) or the PAL for the purposes of decision making regarding active treatment or providing alternate drinking water sources (35 ppb).

Of the 22 private wells sampled, PFOS and/or PFOA were detected only in shallow aquifer wells to the southwest of Area 6 (**Figure 10**). PFOS and/or PFOA were not detected in the deeper wells located to the south and southwest of Area 6. As discussed in the preceding section, PFOA was more frequently detected and detected at greater concentrations than PFOS in groundwater monitoring well samples. In contrast to the on-Base groundwater samples, private wells generally had detections of both PFOA and PFOS (**Table 6**). Additionally, in 4 of the 5 wells with exceedances of the Lifetime Health Advisory level, PFOS was detected at greater concentrations than PFOA. As shown on **Figures 11 and 12**, the private wells with detections of vinyl chloride and 1,4-dioxane coincided with locations with exceedances of the Lifetime Health Advisory level for PFOS and PFOA.

Data Validation Summary

QC deficiencies were identified by the data validator and were qualified as necessary. All data points are usable as qualified. Field reagent blanks were only run on the same schedule as the field samples for this project to expedite receipt of validated data. Samples processed for PFAS analysis with the TOP Assay were not validated. Because of the competing oxidants in the samples, it took extended testing to determine the appropriate level of oxidant to perform the assay appropriately. The TOP Assay is not a multi-laboratory-validated method. It is not a standardized method, subjecting the data to National Functional Guidelines, and did not meet project objectives; therefore, it was not performed. The Data Validation Summary Reports are provided in **Attachments 4 and 5**.

Conclusions

The PFOA/PFOS Lifetime Health Advisory level was exceeded in five drinking water samples collected off-Base; four single-family residences and one community supply well that serves up to 20 residents and one on-Base groundwater monitoring well located in the former industrial waste disposal area. The residents, including one real estate office, associated with the drinking water exceedances are being provided bottled drinking water until a suitable long-term solution is identified through the EE/CA process (CH2M, 2020). Delivery of bottled water commenced in March 2018. The parcels with exceedances and those adjacent to them are being incorporated into the biannual drinking water sampling program for Ault Field and OLF Coupeville. Because PFAS was detected at concentrations exceeding the Lifetime Health Advisory level in both on- and off-Base wells, further

investigation of the PFAS source and migration pathways is warranted. Additional investigation is planned as part of a future PFAS RI for Area 6.

The primary conclusions of the Area 6 investigation are summarized as follows:

- Sampling of on-Base monitoring wells and GETR influent and effluent confirmed the presence of PFAS in the shallow aquifer underlying Area 6. Detection of PFOS, PFOA, and PFBS are generally coincident with the footprint of the VOC and 1,4-dioxane groundwater plumes (that is, along the western Area 6 boundary). Lowlevel concentrations of PFOA were detected in one shallow aquifer well along the eastern Area 6 boundary and in one intermediate aquifer well.
- The concentrations and spatial distribution of vinyl chloride and 1,4-dioxane in groundwater monitoring wells are consistent with the footprint of the VOC and 1,4-dioxane groundwater plumes based on data collected as part of the long-term monitoring program for Area 6.
- PFOA and/or PFOS were detected in 10 private, off-Base shallow aquifer drinking water and/or groundwater
 wells located southwest of Area 6. PFOA and/or PFOS concentrations detected in private, off-Base wells were
 greater than the groundwater monitoring well samples, with 5 wells having exceedances of the Lifetime
 Health Advisory level. PFOA, PFOS, and PFBS were not detected in private, off-Base wells to the west or
 southeast of Area 6, including the three wells deeper than 200 feet in total depth.
- Low-level concentrations of vinyl chloride and/or 1,4-dioxane were detected in five private, off-Base shallow
 aquifer drinking water and/or groundwater wells located southwest of Area 6. Detections of vinyl chloride
 and/or 1,4-dioxane were coincident with wells having exceedances of the PFOA/PFOS Lifetime Health
 Advisory level. Detected off-Base concentrations of vinyl chloride and 1,4-dioxane were below the PAL for
 groundwater plume delineation.
- Parcels with exceedances of the Lifetime Health Advisory level and those adjacent are being incorporated into the biannual drinking water sampling program.
- Additional investigation of PFAS source(s) and transport pathways will be conducted during a future RI for the site.

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Tables

Table 1. Area 6 Synoptic Groundwater Elevation Survey

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water Ault Field, Area 6, Naval Air Station Whidbey Island Oak Harbor, Washington

Well Name	Measurement Date	Top of Casing Elevation (feet NAVD88)	Measured Total Depth (feet btoc)	Depth to Water (feet btoc)	Groundwater Elevation (feet NAVD88)
6-I-1	12/4/2017	173.99	179.53	105.34	68.65
6-I-3	12/4/2017	198.62	180.14	124.81	73.81
6-S-2	12/5/2017	183.59	105.45	92.78	90.81
6-S-4	12/4/2017	212.97	143.05	136.22	76.75
6-S-7	12/4/2017	96.92	41.2	8.36	88.56
6-S-8	12/4/2017	163.67	86.13	73.21	90.46
6-S-14	12/4/2017	211.49	164.7	129.88	81.61
6-S-17	12/4/2017	206.09	146.81	127.33	78.76
6-S-19	12/4/2017	219.37	167.74	144.41	74.96
6-S-26	12/4/2017	128.48	76.82	38.38	90.10
6-S-31	12/4/2017	194.94	122.96	108.89	86.05
6-S-44	12/4/2017	UNK	98.23	83.73	UNK
MW-10	12/4/2017	216.21	170.16	136.27	79.94
P-4	12/5/2017	96.71	20.67	3.12	93.59

Notes:

btoc = below top of casing

NAVD88 = North American Vertical Datum of 1988

UNK = unknown

Table 2. Water Quality Parameters - Groundwater Monitoring Wells

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water Ault Field, Area 6, Naval Air Station Whidbey Island Oak Harbor, Washington

Well Name	Sample ID	Sample Date	Sample Time	Static Depth to Water (ft btoc)	Total Volume Purged (mL)	рН	Conductivity (mS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Oxidation- Reduction Potential (mV)	Turbidity (NTU)	Comment - internal use
6-DW-38A	WI-A06-DW-38A-0218	2/20/2018	14:45	117.38	2520	7.85	0.963	9.24	1.41	-192	11.9	all parameters stabilized except temperature - variable due to outside temps
6-I-1	WI-A06-6-I-01-1217	12/5/2017	14:41	105.36	4000	8.29	0.325	10.73	8.28	204	2.3	
6-I-3	WI-A06-6-I-03-1217	12/6/2017	10:31	124.92	7500	7.8	0.32	10.07	7.45	-88	0.5	
6-S-1	WI-A06-S-01-0218	2/19/2018	11:50	90.5	6750	7.37	0.484	11.06	6.99	69	0.85	
6-S-2	WI-A06-6-S-02-0218	2/23/2018	11:45	92.58	4030	8.19	0.291	11.19	6.55	220	4.9	
6-S-04	WI-A06-6-S-04	12/11/2017	10:10	135.9	2500	7.14	0.508	9.69	0	-34	7.6	all parameters stabilized except temperature - variable due to outside temps
6-S-05	WI-A06-6-S-05-0218	2/23/2017	10:33	96.46	6600	8.42	0.41	11.49	5.03	228	26.6	
6-S-7	WI-A06-6-S-07-1217	12/7/2017	11:45	8.39	20700	7.49	0.766	10.32	7.26	-125	4.8	
6-S-08	WI-A06-6-S-08-1217	12/12/2017	9:30	73.19	6875	7.04	0.17	9.91	5.62	167	33.5	
6-S-11	WI-A06-6-S-11-0718	7/17/2018	17:30	106.76	6900	6.51	0.671	16.39	0.17	-85	44.8	
6-S-12	WI-A06-6-S-12-0119	1/23/2019	11:15	111.46	4900	6.99	0.818	9.9	3.34	-132	176	
6-S-14	WI-A06-6-S-14-1217	12/8/2017	13:08	129.82	7500	7.69	0.924	11.66	6.44	-84	3.9	
6-S-17	WI-A06-6-S-17-1217	12/6/2017	13:02	127.41	7500	7.57	0.986	13.25	7.32	85	0.9	
6-S-19	WI-A06-6-S-19-1217	12/11/2017	11:50	144.03	3000	7.34	0.789	11.32	0	40	2.7	
6-S-24	WI-A06-6-S-24-0818	8/30/2018	12:20	111.46	7292	7.65	0.617	14.11	6.66	152	9.8	
6-S-26	WI-A06-6-S-26-1217	12/7/2017	13:37	38.44	14000	8.35	0.832	10.31	8.44	-157	11.9	
6-S-27	WI-A06-6-S-27-0218	2/21/2018	11:14	121.75	6250	7.74	0.396	9.59	6.46	168	0.05	
6-S-28	WI-A06-6-S-28-0218	2/21/2018	11:12	121.68	2800	6.7	0.602	9.84	1.04	-146	12.3	
6-S-31	WI-A06-6-S-31-1217	12/11/2017	14:08	108.78	8750	7.88	0.504	9.69	2.01	179	3.7	purged > 1 hr. DO not stabilized
6-S-40	WI-A06-6-S-40-0718	7/18/2018	9:45	90.93	7650	8.12	0.201	16.69	0.67	63	120	
6-S-41	WI-A06-6-S-41-0718	7/18/2018	13:36	100.04	11435	7.68	0.243	18.71	7.9	99	6.63	
6-S-42	WI-A06-6-S-42-0718	7/19/2018	9:40	109.68	10997	6.84	0.715	14.19	1.77	74	85.2	
6-S-43	WI-A06-6-S-43-0718	7/19/2018	13:49	99.13	8060	7.16	0.581	15.4	6.91	32	75.7	Do not stabilized
6-S-44	WI-A06-6-S-44-1217	12/8/2017	10:44	83.72	5000	7.9	0.874	10.46	7.29	268	0	
GTS_Effluent	WI-A06-EFF01-1217	12/5/2017	12:05	NA	NA	7.9	0.854	8.9	23.61	205	25.4	
GTS_Influent	WI-A06-INF01-1217	12/5/2017	12:15	NA	NA	8.02	0.878	10.51	12.61	91	8.1	
MW-01	WI-A06-MW-01-0218	2/21/2018	15:06	79.45	14000	7.75	0.56	9.17	1.54	28	2.83	
MW-3B	WI-A06-MW-3B-0218	2/22/2018	14:55	103.25	4600	7.53	0.793	9.57	2.49	70	0	
MW-06	WI-A06-MW-06-0218	2/16/2018	14:34	112.36	2500	7.38	0.608	10.83	1.83	-44	0	
MW6	WI-A06-MW6-0218	2/22/2018	11:51	112.65	5500	7.12	0.595	11.51	1.29	-109	0	
MW-10	WI-A06-MW-10-1217	12/7/2017	9:42	136.18	5250	7.5	0.641	13.93	6.68	-90	2.4	
MW-13	WI-A06-MW-13-0218	2/20/2018	11:05	105.8	3420	7.29	0.439	10.26	5.69	91	0.07	
P-4	WI-A06-P-4-1217	12/5/2017	10:45	3.12	3785	6.93	0.761	9.05	7.88	-39	>1000	Brown and muddy. No parameters stable.

Note:

°C = degrees Celsius

ft btoc = feet below top of casing

ID = identification

mg/L = milligram(s) per liter

mL = milliliter(s)

mS/cm = milliseimens per centimeter

mV = millivolt(s)

NA = not applicable

NTU = nephelometric turbidity units

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime	DCI - Townstow IIO 40	6-DW-38A	6-I-01	6-I-03	S-01	6-S-02	6-S-04	
Sample ID	Health Advisory	RSLs Tapwater HQ = 1.0 (November 2018)	WI-A06-6-DW-38A-0218	WI-A06-6-I-01-1217	WI-A06-6-I-03-1217	WI-A06-S-01-0218	WI-A06-6-S-02-0218	WI-A06-6-S-04-1217 12/11/17	
Sample Date	(May 2016)	(November 2018)	2/20/18	12/5/17	12/6/17	2/19/18	2/23/18		
Chemical Name									
Semivolatile Organic Compounds (ppt)									
Perfluorobutanesulfonic acid (PFBS)		400,000	2.74 J	5.39 U	5.68 U	5.17 U	5.03 J	5 U	
Perfluoroheptanoic acid (PFHpA)			1.7 J	5.39 U	5.68 U	5.17 U	5.25 U	5 U	
Perfluorohexanesulfonic acid (PFHxS)			1.05 J	5.39 U	5.68 U	5.17 U	18	5 U	
Perfluorohexanoic Acid (PFHxA)			15.7	5.4 U	5.7 U	5.2 U	5.25 U	6.84 J	
Perfluorononanoic acid (PFNA)			1.35 J	5.39 U	5.68 U	5.17 U	5.25 U	5 U	
Perfluorooctane Sulfonate (PFOS)	70		2.77 J	5.39 U	5.68 U	5.17 U	5.25 U	5 U	
Perfluorooctanoic acid (PFOA)	70		5.98 U	1.09 J	5.68 U	5.17 U	9.64	5 U	
PFOA + PFOS	70		2.77 J	1.09 J	NA	NA	9.64	NA	

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

<u>Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0</u>

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime	DCI a Tamasatan IIO 40	6-9	5-05	6-S-07	6-S-08	6-S-11	6-S-	12
Sample ID	Health Advisory	RSLs Tapwater HQ = 1.0 (November 2018)	WI-A06-6-S-05-0218	WI-A06-6-S-05P-0218	WI-A06-6-S-07-1217	WI-A06-6-S-08-1217	WI-A06-S-11-0718	WI-A06-S-12-0119	WI-A06-S-12P-0119
Sample Date	(May 2016)	(November 2018)	2/23/18	2/23/18	12/7/17	12/12/17	7/17/18	1/23/19	1/23/19
Chemical Name									
Semivolatile Organic Compounds (ppt)									
Perfluorobutanesulfonic acid (PFBS)		400,000	5.12 U	5 U	13	5.04 U	9.31	9.44	9.32 J
Perfluoroheptanoic acid (PFHpA)			5.12 U	0.654 J	10.3	5.04 U	5.13 J	4.67 U	4.01 J
Perfluorohexanesulfonic acid (PFHxS)			4.45 J	3.66 J	35	5.04 U	20.1	14.2	12.6
Perfluorohexanoic Acid (PFHxA)			5.12 U	5 U	40.7	5.04 U	29.9	29.3	27.6
Perfluorononanoic acid (PFNA)			5.12 U	5 U	5.39 U	5.04 U	4.17 U	4.67 U	4.81 U
Perfluorooctane Sulfonate (PFOS)	70		5.12 U	5 U	5.39 U	5.04 U	4.17 U	4.67 U	4.81 U
Perfluorooctanoic acid (PFOA)	70		5.12 U	5 U	39.2	5.04 U	43.4	24	22
PFOA + PFOS	70		NA	NA	39.2	NA	43.4	24	22

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

<u>Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0</u>

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime	DCI a Tamasatan IIO 40	6-S-14	6-S-17	6-S	-19	6-9	S-24	6-S-26
Sample ID	Health Advisory	RSLs Tapwater HQ = 1.0 (November 2018)	WI-A06-6-S-14-1217	WI-A06-6-S-17-1217	WI-A06-6-S-19-1217	WI-A06-6-S-19P-1217	WI-A06-S-24-0818	WI-A06-S-24P-0818	WI-A06-6-S-26-1217
Sample Date	(May 2016)	(November 2018)	12/8/17	12/6/17	12/11/17	12/11/17	8/30/18	8/30/18	12/7/17
Chemical Name									
Semivolatile Organic Compounds (ppt)									
Perfluorobutanesulfonic acid (PFBS)		400,000	10.2	5.25 U	4.22 J	4.15 J	4.23 J	4.68 J	9.28
Perfluoroheptanoic acid (PFHpA)			3.61 J	5.25 U	1.66 J	1.95 J	4.24 U	4.35 U	13.4
Perfluorohexanesulfonic acid (PFHxS)			13.8	5.25 U	6.21 J	5.39 J	16.4	13.9	47.8
Perfluorohexanoic Acid (PFHxA)			25.6	5.25 U	21.8	22.8	12.5	12.2	35.2
Perfluorononanoic acid (PFNA)			5.25 U	5.25 U	5.17 U	5.21 U	4.24 U	4.35 U	3.71 J
Perfluorooctane Sulfonate (PFOS)	70		5.25 U	5.25 U	5.17 U	5.21 U	4.24 U	4.35 U	5.6 J
Perfluorooctanoic acid (PFOA)	70		19.6	5.25 U	4.21 J	4.2 J	4.24 U	4.35 U	52.3
PFOA + PFOS	70		19.6	NA	4.21 J	4.2 J	NA	NA	57.9

Notes:

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HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

Samples - PFAS

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime	DCI - Tt110 . 4.0	6-S-27	6-S-28	6-S-31	6-S-40	6-S-41	6-9	5-42
Sample ID	Health Advisory	RSLs Tapwater HQ = 1.0 (November 2018)	WI-A06-6-S-27-0218	WI-A06-6-S-28-0218	WI-A06-6-S-31-1217	WI-A06-6-S-40-0718	WI-A06-6-S-41-0718	WI-A06-6-S-42-0718	WI-A06-6-S-42P-0718
Sample Date	(May 2016)	(November 2018)	2/21/18	2/21/18	12/11/17	7/18/18	7/18/18	7/19/18	7/19/18
Chemical Name									
Semivolatile Organic Compounds (ppt)									
Perfluorobutanesulfonic acid (PFBS)		400,000	2.27 J	5.17 U	14.3	4.17 U	4.13 U	4.1 U	4.2 U
Perfluoroheptanoic acid (PFHpA)			12.5	5.17 U	29.3	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorohexanesulfonic acid (PFHxS)			10.7	5.17 U	41.1	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorohexanoic Acid (PFHxA)			15.2	5.17 U	58.3	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorononanoic acid (PFNA)			5.17 U	5.17 U	5.04 U	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorooctane Sulfonate (PFOS)	70		2.3 J	1.69 J	1.82 J	4.17 U	4.13 U	4.1 U	4.2 U
Perfluorooctanoic acid (PFOA)	70		35.6	5.17 U	53.8	4.17 U	4.13 U	4.1 U	4.2 U
PFOA + PFOS	70		37.9	1.69 J	55.6	NA	NA	NA	NA

Notes:

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Shading indicates detection

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HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime	DCI a Tanasatan IIO 4.0	6-S-43	6-S-44	EFF	-01	INF01	MW-01
Sample ID	Health Advisory	RSLs Tapwater HQ = 1.0 (November 2018)	WI-A06-6-S-43-0718	WI-A06-6-S-44-1217	WI-A06-EFF01-1217	WI-A06-EFF01P-1217	WI-A06-INF01-1217	WI-A06-MW-01-0218
Sample Date	(May 2016)	(November 2018)	7/19/18	12/8/17	12/5/17	12/5/17	12/5/17	2/21/18
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)		400,000	4.24 U	10.5	10.5	10	10.6	62.5 J
Perfluoroheptanoic acid (PFHpA)			4.24 U	13.4	11.8	11.3	11.3	22.3
Perfluorohexanesulfonic acid (PFHxS)			4.24 U	62.5	43	49.2	45.7	16.6
Perfluorohexanoic Acid (PFHxA)			9.46	44.7	40.7	37.4	39.5	111
Perfluorononanoic acid (PFNA)			4.24 U	6.3 J	5.43 U	5.39 U	5.43 U	5.17 U
Perfluorooctane Sulfonate (PFOS)	70		4.24 U	5.17 U	5.43 U	5.39 U	5.43 U	5.17 U
Perfluorooctanoic acid (PFOA)	70		4.24 U	96.9	35.8	28.6	35.1	5.17 U
PFOA + PFOS	70		NA	96.9	35.8	28.6	35.1	NA

Notes:

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Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

<u>Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0</u>

B = Analyte not detected above the level reported in blanks

HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime	201 7 1 110 10	MW03B	MW-06	MW-10	MW-13	P-4
Sample ID	Health Advisory	RSLs Tapwater HQ = 1.0 (November 2018)	WI-A06-MW03B-0218	WI-A06-MW-06-0218	WI-A06-MW-10-1217	WI-A06-MW-13-0218	WI-A06-P-4-1217
Sample Date	(May 2016)	(November 2018)	2/22/18	2/16/18	12/7/17	2/20/18	12/5/17
Chemical Name							
Semivolatile Organic Compounds (ppt)							
Perfluorobutanesulfonic acid (PFBS)		400,000	5.25 U	5.3 U	2.3 J	5.12 U	9.73
Perfluoroheptanoic acid (PFHpA)			5.25 U	5.3 U	5.58 U	5.12 U	11.9
Perfluorohexanesulfonic acid (PFHxS)			5.25 U	5.3 U	2.24 J	5.12 U	35
Perfluorohexanoic Acid (PFHxA)			3.55 J	5.3 U	5.44 J	5.12 U	34.3
Perfluorononanoic acid (PFNA)			5.25 U	5.3 U	5.58 U	5.12 U	1.49 J
Perfluorooctane Sulfonate (PFOS)	70		5.25 U	5.3 U	5.58 U	5.12 U	5.25 U
Perfluorooctanoic acid (PFOA)	70		5.25 U	5.3 U	5.58 U	5.12 U	58.2
PFOA + PFOS	70		NA	NA	NA	NA	58.2

Notes:

-- = no screening criteria available

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

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HA = hazard quotient

ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

U = The material was analyzed for, but not detected

Volatile and Semivolatile Organic Compounds

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and

Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	PAL for Alternate	PAL for Groundwater	6-DW-38A	S-(01	6-S-02	6-9	-05	6-S-11	6-S-	-12
Sample ID		Drinking Water Plume Delineation	WI-A06-6-DW-38A-0218	WI-A06-S-01-0218	WI-A06-S-01P-0218	WI-A06-6-S-02-0218	WI-A06-6-S-05-0218	WI-A06-6-S-05P-0218	WI-A06-S-11-0718	WI-A06-S-12-0119	WI-A06-S-12P-0119
Sample Date	Drillking water	Piume Deimeation	2/20/18	2/19/18	2/19/18	2/23/18	2/23/18	2/23/18	7/17/18	1/23/19	1/23/19
Chemical Name											
Volatile Organic Compounds (ppb)											
Vinyl chloride	2ª	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Semivolatile Organic Compounds (ppb)											
1,4-Dioxane	35 ^c	0.44 ^d	1.7	0.029 U	0.031 U	0.029 U	0.029 U	0.032 U	4.4	3.8 J	3.7

Notes:

 a The USEPA Federal maximum contaminant level b The MTCA method B cleanup level, modified for an excess cancer risk of 1 x 1C 5 .

^cConcentration has been modified for an excess cancer risk of 1 x 10⁴. Integrated Risk Information

System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

<u>Underlined text indicates exceedance of the PAL for providing an alternate source of drinking wate</u>

-- = no screening criteria available

ID = identificatioin

J = Analyte present. Value may or may not be

accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Volatile and Semivolatile Organic Compounds

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and

Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	PAL for Alternate	PAL for Groundwater	6-9	5-24	6-S-27	6-S-28	6-S-40	6-S-41	6-9	S-42	6-S-43
Sample ID	Drinking Water	Plume Delineation	WI-A06-S-24-0818	WI-A06-S-24P-0818	WI-A06-6-S-27-0218	WI-A06-6-S-28-0218	WI-A06-6-S-40-0718	WI-A06-6-S-41-0718	WI-A06-6-S-42-0718	WI-A06-6-S-42P-0718	WI-A06-6-S-43-0718
Sample Date	Drinking water	Plume Delineation	8/30/18	8/30/18 8/30/18	2/21/18	2/21/18	7/18/18	7/18/18	7/19/18	7/19/18	7/19/18
Chemical Name											
Volatile Organic Compounds (ppb)											
Vinyl chloride	2ª	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	1.8 J
Semivolatile Organic Compounds (ppb)											
1,4-Dioxane	35 ^c	0.44 ^d	0.17 J	0.16 J	0.029 U	0.029 U	0.047 U	0.047 U	0.2	0.15 J	2.8 J

Notes:

 a The USEPA Federal maximum contaminant level b The MTCA method B cleanup level, modified for an excess cancer risk of 1 x 1C 5 .

^cConcentration has been modified for an excess cancer risk of 1 x 10⁴. Integrated Risk Information

System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

<u>Underlined text indicates exceedance of the PAL for providing an alternate source of drinking wate</u>

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MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Volatile and Semivolatile Organic Compounds

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and

Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name Sample ID Sample Date	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	MW-01 WI-A06-MW-01-0218 2/21/18	MW-03B WI-A06-MW03B-0218 2/22/18	MW-06 WI-A06-MW-06-0218 2/16/18	MW-13 WI-A06-MW-13-0218 2/20/18
Chemical Name						
Volatile Organic Compounds (ppb)						
Vinyl chloride	2ª	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U
Semivolatile Organic Compounds (ppb)						
1,4-Dioxane	35 ^c	0.44 ^d	0.028 U	0.03 U	0.029 U	0.031 U

Notes:

 a The USEPA Federal maximum contaminant level b The MTCA method B cleanup level, modified for an excess cancer risk of 1 x 1C 5 .

^cConcentration has been modified for an excess cancer risk of 1 x 10⁴. Integrated Risk Information

System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

<u>Underlined text indicates exceedance of the PAL for providing an alternate source of drinking wate</u>

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ID = identificatioin

J = Analyte present. Value may or may not be

accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level ppb = parts per billion

U = The material was analyzed for, but not

Groundwater Monitoring Well and Treatment System Samples

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	BCLs Tanuator HO -		6-I-01		6-1-03	6-	S-04	(5-S-07
Sample ID		1.0 (November 2018)	I WI-Δ06-6-I-01-1217	WI-A06-6-I-01-1217-TOP	WI-A06-6-I-03-1217	WI-A06-6-I-03-1217-TOP	WI-A06-6-S-04-1217	WI-A06-6-S-04-1217-TOP	WI-A06-6-S-07-1217	WI-A06-6-S-07-1217-TOP
Sample Date	Advisory (iviay 2016)) 1.0 (NOVEITIBET 2018)	12/5/17	12/5/17	12/6/17	12/6/17	12/11/17	12/11/17	12/7/17	12/7/17
Chemical Name										
Semivolatile Organic Compounds (ppt)										
Perfluorobutanesulfonic acid (PFBS)		400,000	5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	13	10.7
Perfluoroheptanoic acid (PFHpA)			5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	10.3	10.6
Perfluorohexanesulfonic acid (PFHxS)			5.39 U	2.6 J	5.68 U	2.2 J	5 U	1.64 JB	35	34.7 B
Perfluorohexanoic Acid (PFHxA)			5.39 U	5.12 U	5.68 U	5.08 U	6.84 J	8.48 J	40.7	44.6
Perfluorononanoic acid (PFNA)			5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	5.39 U	5.25 U
Perfluorooctane Sulfonate (PFOS)	70		5.39 U	5.12 U	5.68 U	5.08 U	5 U	5.43 U	5.39 U	5.25 U
Perfluorooctanoic acid (PFOA)	70		1.09 J	1.14 JB	5.68 U	5.08 U	5 U	2.84 JB	39.2	39.2 B
PFOA+PFOS	70		1.09 J	1.14 JB	NA	NA	NA	2.84 JB	39.2	39.2 B

Notes:

Shading indicates detection

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ID = identification

J = Analyte present. Value may or may not be accurate or precise

NA = not applicable

PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

Groundwater Monitoring Well and Treatment System Samples

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	BSI s Tanwatar HO =	6	5-S-08	6	5-S-14		6-S-17	6	-S-19
Sample ID		1.0 (November 2018)	WI-A06-6-S-08-1217	WI-A06-6-S-08-1217-TOP	WI-A06-6-S-14-1217	WI-A06-6-S-14-1217-TOP	WI-A06-6-S-17-1217	WI-A06-6-S-17-1217-TOP	WI-A06-6-S-19-1217	WI-A06-6-S-19-1217-TOP
Sample Date	Advisory (iviay 2016)	1.0 (November 2018)	12/12/17	12/12/17	12/8/17	12/8/17	12/6/17	12/6/17	12/11/17	12/11/17
Chemical Name										
Semivolatile Organic Compounds (ppt)										
Perfluorobutanesulfonic acid (PFBS)		400,000	5.04 U	5.25 U	10.2	8.99	5.25 U	5.34 U	4.22 J	5.01 J
Perfluoroheptanoic acid (PFHpA)			5.04 U	5.25 U	3.61 J	3.44 J	5.25 U	5.34 U	1.66 J	5.25 U
Perfluorohexanesulfonic acid (PFHxS)			5.04 U	5.25 U	13.8	15.3 B	5.25 U	2.64 JB	6.21 J	5.37 JB
Perfluorohexanoic Acid (PFHxA)			5.04 U	5.25 U	25.6	33.2	5.25 U	2.65 J	21.8	27.1
Perfluorononanoic acid (PFNA)			5.04 U	5.25 U	5.25 U	5.39 U	5.25 U	5.34 U	5.17 U	5.25 U
Perfluorooctane Sulfonate (PFOS)	70		5.04 U	5.25 U	5.25 U	5.39 U	5.25 U	5.34 U	5.17 U	5.25 U
Perfluorooctanoic acid (PFOA)	70		5.04 U	5.25 U	19.6	20 B	5.25 U	4.11 JB	4.21 J	7.47 JB
PFOA+PFOS	70		NA	NA	19.6	20 B	NA	4.11 JB	4.21 J	7.47 JB

Notes:

Shading indicates detection

Bolded text indicated exceedance of USEPA Lifetime Health Advisory

<u>Underlined text indicated exceedance of USEPA Tapwater RSL, HQ = 1.0</u>

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ppt = parts per trillion

RSL = Regional Screening Level

TOP = total oxidizable precursor

U = The material was analyzed for, but not

Groundwater Monitoring Well and Treatment System Samples

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	DCI a Tamwatar UO -		6-S-19		6-S-26	6	-S-31
Sample ID	Advisory (May 2016)	•	WI-A06-6-S-19P-1217	WI-A06-6-S-19P-1217-TOP	WI-A06-6-S-26-1217	WI-A06-6-S-26-1217-TOP	WI-A06-6-S-31-1217	WI-A06-6-S-31-1217-TOP
Sample Date	Advisory (iviay 2016)	1.0 (November 2018)	12/11/17	12/11/17	12/7/17	12/7/17	12/11/17	12/11/17
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)		400,000	4.15 J	4.79 J	9.28	9.45	14.3	15.4
Perfluoroheptanoic acid (PFHpA)			1.95 J	5.25 U	13.4	12.6	29.3	30.5
Perfluorohexanesulfonic acid (PFHxS)			5.39 J	6.34 JB	47.8	50.2 B	41.1	51.4 B
Perfluorohexanoic Acid (PFHxA)			22.8	29	35.2	41.3	58.3	71.2
Perfluorononanoic acid (PFNA)			5.21 U	5.25 U	3.71 J	6.03 J	5.04 U	5.53 U
Perfluorooctane Sulfonate (PFOS)	70		5.21 U	5.25 U	5.6 J	10.1	1.82 J	5.53 U
Perfluorooctanoic acid (PFOA)	70		4.2 J	8.04 JB	52.3	54.7 B	53.8	55.3 B
PFOA+PFOS	70		4.2 J	8.04 JB	57.9	64.8	55.6	55.3 B

Notes:

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ppt = parts per trillion

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Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	DCI a Tamuratan HO -		6-	-S-42			6-S-43		6-S-44
Sample ID	Advisory (May 2016)	•	W/I-Δ06-6-S-42-071X	WI-A06-6-S-42-0718-TOP	WI-A06-6-S-42P-0718	WI-A06-6-S-42P-0718-TOP	WI-A06-6-S-43-0718	WI-A06-6-S-43-0718-TOP	WI-A06-6-S-44-1217	WI-A06-6-S-44-1217-TOP
Sample Date	Auvisory (iviay 2016)	1.0 (November 2016)	7/19/18	7/19/18	7/19/18	7/19/18	7/19/18	7/19/18	12/8/17	12/8/17
Chemical Name										
Semivolatile Organic Compounds (ppt)										
Perfluorobutanesulfonic acid (PFBS)		400,000	4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	10.5	11.2
Perfluoroheptanoic acid (PFHpA)			4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	13.4	12.8
Perfluorohexanesulfonic acid (PFHxS)			4.1 U	3.51 J	4.2 U	4.2 U	4.24 U	4.2 U	62.5	48.5 B
Perfluorohexanoic Acid (PFHxA)			4.1 U	4.13 U	4.2 U	4.2 U	9.46	8.35 J	44.7	54.2
Perfluorononanoic acid (PFNA)			4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	6.3 J	7.39 J
Perfluorooctane Sulfonate (PFOS)	70		4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	5.17 U	5.51 J
Perfluorooctanoic acid (PFOA)	70		4.1 U	4.13 U	4.2 U	4.2 U	4.24 U	4.2 U	96.9	87.3 B
PFOA+PFOS	70		NA	NA	NA	NA	NA	NA	96.9	92.8

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RSL = Regional Screening Level

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Groundwater Monitoring Well and Treatment System Samples

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	BSI s Tamwatar HO =		EF	F01			INF01
Sample ID		1.0 (November 2018)	WI-A06-EFF01-1217	WI-A06-EFF01-1217-TOP	WI-A06-EFF01P-1217	WI-A06-EFF01P-1217-TOP	WI-A06-INF01-1217	WI-A06-INF01-1217-TOP
Sample Date	Advisory (iviay 2016)	1.0 (November 2016)	12/5/17	12/5/17	12/5/17	12/5/17	12/5/17	12/5/17
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)		400,000	10.5	12.3	10	10.9	10.6	12.3
Perfluoroheptanoic acid (PFHpA)			11.8	14.6	11.3	16	11.3	16.5
Perfluorohexanesulfonic acid (PFHxS)			43	45.8	49.2	56.7	45.7	50.3
Perfluorohexanoic Acid (PFHxA)			40.7	49.8	37.4	50.4	39.5	53.7
Perfluorononanoic acid (PFNA)			5.43 U	5.25 U	5.39 U	5.08 U	5.43 U	5.04 U
Perfluorooctane Sulfonate (PFOS)	70		5.43 U	5.25 U	5.39 U	5.08 U	5.43 U	5.04 U
Perfluorooctanoic acid (PFOA)	70		35.8	42.7 B	28.6	47.4 B	35.1	44 B
PFOA+PFOS	70		35.8	42.7 B	28.6	47.4 B	35.1	44 B

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RSL = Regional Screening Level

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Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in

Groundwater and Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	LICEDA Lifetimo Llegith	DCI a Tamusatan IIO -	M	IW-10	1	P-4	
Sample ID	USEPA Lifetime Health	•	WI-A06-MW-10-1217	WI-A06-MW-10-1217-TOP	WI-A06-P-4-1217	WI-A06-P-4-1217-TOP 12/5/17	
Sample Date	Advisory (iviay 2016)	1.0 (November 2018)	12/7/17	12/7/17	12/5/17		
Chemical Name							
Semivolatile Organic Compounds (ppt)							
Perfluorobutanesulfonic acid (PFBS)		400,000	2.3 J	2.39 J	9.73	11.6	
Perfluoroheptanoic acid (PFHpA)			5.58 U	5.21 U	11.9	16.2	
Perfluorohexanesulfonic acid (PFHxS)			2.24 J	4.27 JB	35	36.2	
Perfluorohexanoic Acid (PFHxA)			5.44 J	5.56 J	34.3	45.4	
Perfluorononanoic acid (PFNA)			5.58 U	5.21 U	1.49 J	3.31 J	
Perfluorooctane Sulfonate (PFOS)	70		5.58 U	5.21 U	5.25 U	6.18 J	
Perfluorooctanoic acid (PFOA)	70		5.58 U	6.31 JB	58.2	64.6 B	
PFOA+PFOS	70		NA	6.31 JB	58.2	70.8 JB	

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RSL = Regional Screening Level

TOP = total oxidizable precursor

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Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Islana

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	RSLs Tapwater HQ = 1.0	RW01	RW02	RW03	RW04		RW05		RW06	RW07
Sample ID	Advisory (May 2016)	(November 2018)	WI-A06-RW01-0218	WI-A06-RW02-0218	WI-A06-RW03-0218	WI-A06-RW04-0218	WI-A06-RW05-0218 WI-A06-RW05-0818 V		WI-A06-RW05P-0218	WI-A06-RW06-0218	WI-A06-RW07-0218
Sample Date	Advisory (iviay 2016)	(November 2018)	2/5/18	2/5/18	2/5/18	2/5/18	2/6/18	8/29/18	2/6/18	2/6/18	2/6/18
Chemical Name											
Semivolatile Organic Compounds (ppt)											
Perfluorobutanesulfonic acid (PFBS)		400,000	5.25 U	5.02 U	41.8	37.9	28.9	26.2	28.9	5 U	4.94 U
Perfluoroheptanoic acid (PFHpA)			5.25 U	5.02 U	19.9	1.52 J	20.2	16.2	21.4	5 U	4.94 U
Perfluorohexanesulfonic acid (PFHxS)			5.25 U	1.31 J	108	50.6	210	200	232	5 U	4.94 U
Perfluorohexanoic Acid (PFHxA)			5.25 U	5.02 U	55.7	4.92 U	48.6	37.5	49.8	5 U	4.94 U
Perfluorononanoic acid (PFNA)			5.25 U	5.02 U	5.08 U	4.92 U	4.98 U	4.98 U	1.67 J	5 U	4.94 U
Perfluorooctane Sulfonate (PFOS)	70		5.25 U	5.02 U	7.59 J	2.77 J	64.1	95.3	63.8	5 U	4.94 U
Perfluorooctanoic acid (PFOA)	70		5.25 U	5.02 U	27.9	4.15 J	57.7	55.4	55.3	5 U	4.94 U
PFOA + PFOS	70		NA	NA	35.5	6.9 J	121.8	150.7	119.1	NA	NA

Notes:

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PFAS = per- and polyfluoroalkyl substances

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RSL = Regional screening level

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Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Islana

Oak Harbor, Washington

Well Name	LICEDA Lifetimo Lleelth	RSLs Tapwater HQ = 1.0	RV	V08	RW09	RW10	RW11	RW12	RW13	RW14	RW15
Sample ID		•	WI-A06-RW08-0218	WI-A06-RW08-0918	WI-A06-RW09-0218	WI-A06-RW10-0218	WI-A06-RW11-0218	WI-A06-RW12-0218	WI-A06-RW13-0218	WI-A06-RW14-0218	WI-A06-RW15-0218
Sample Date	Advisory (May 2016)	(November 2018)	2/6/18	9/27/18	2/7/18	2/12/18	2/12/18	2/12/18	2/13/18	2/14/18	2/14/18
Chemical Name											
Semivolatile Organic Compounds (ppt)											
Perfluorobutanesulfonic acid (PFBS)		400,000	23	25.9	4.43 U	4.55 U	4.53 U	2.27 J	4.94 U	58	4.9 L
Perfluoroheptanoic acid (PFHpA)			8.81 J	11.3	4.43 U	4.55 U	4.53 U	4.63 U	4.94 U	16.3	4.9 l
Perfluorohexanesulfonic acid (PFHxS)			116	103	4.43 U	4.55 U	4.53 U	1.51 J	4.94 U	260	4.9 l
Perfluorohexanoic Acid (PFHxA)			15.1	18.6	0.829 J	4.55 U	4.53 U	4.63 U	0.676 J	60.5	4.9 L
Perfluorononanoic acid (PFNA)			2.51 J	3.4 J	4.43 U	4.55 U	4.53 U	4.63 U	4.94 U	5.12 U	4.9 L
Perfluorooctane Sulfonate (PFOS)	70		78.2	95.7	4.43 U	4.55 U	4.53 U	4.63 U	4.94 U	7.68 J	4.9 l
Perfluorooctanoic acid (PFOA)	70		25.4	31.2	4.43 U	4.55 U	4.53 U	1.03 J	4.94 U	21.8	4.9 l
PFOA + PFOS	70		103.6	126.9	NA	NA	NA	1.03 J	NA	29.5	NA

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PFAS = per- and polyfluoroalkyl substances

ppt = parts per trillion

RSL = Regional screening level

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Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Islana

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	RSLs Tapwater HQ = 1.0	RW16	R\	N17		RW18			RW19	
Sample ID		(November 2018)	WI-A06-RW16-0218	WI-A06-RW17-0218	WI-A06-RW17P-0218	WI-A06-RW18-0418	WI-A06-RW18-0818	WI-A06-RW18P-0418	WI-A06-RW19-0318	WI-A06-RW19-0818	WI-A06-RW19P-0818
Sample Date	Advisory (May 2016)	(November 2018)	2/14/18	2/20/18	2/20/18	4/20/18	8/29/18	4/20/18	3/28/18	8/28/18	8/28/18
Chemical Name											
Semivolatile Organic Compounds (ppt)											
Perfluorobutanesulfonic acid (PFBS)		400,000	5.04 U	4.5 U	4.51 U	22.6	22	20.5	64.7	64.9	68.2
Perfluoroheptanoic acid (PFHpA)			5.04 U	4.5 U	4.51 U	9.21 J	11.4	11.3	33.4	37.6	36.5
Perfluorohexanesulfonic acid (PFHxS)			5.04 U	4.5 U	4.51 U	135	87.5	125	233 J	224	242
Perfluorohexanoic Acid (PFHxA)			0.906 J	4.5 U	4.51 U	26.1	27.8	29.3	61.8	69.2	67.3
Perfluorononanoic acid (PFNA)			5.04 U	4.5 U	4.51 U	4.83 U	5.51 U	1.59 J	2.36 J	4.98 U	4.77 U
Perfluorooctane Sulfonate (PFOS)	70		5.04 U	4.5 U	4.51 U	44.7	18	43	75.1	73.8	80.1
Perfluorooctanoic acid (PFOA)	70		5.04 U	4.5 U	4.51 U	29.1	26.1	30.6	44.7	45.6	48.2
PFOA + PFOS	70		NA	NA	NA	73.8	44.1	73.6	119.8	119.4	128.3

Notes:

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Ault Field, Area 6, Naval Air Station Whidbey Islana

Oak Harbor, Washington

Well Name	USEPA Lifetime Health	DCI a Tamuratar IIO - 1 0	RW	/20	RV	V21	R	W22
Sample ID		RSLs Tapwater HQ = 1.0 (November 2018)	WI-A06-RW20-0418	WI-A06-RW20-0818	WI-A06-RW21-0818	WI-A06-RW21P-0818	WI-A06-RW22-0419	WI-A06-RW22P-0419
Sample Date	Advisory (May 2016)	(November 2018)	4/20/18	8/30/18	8/27/18	8/27/18	4/17/19	4/17/19
Chemical Name								
Semivolatile Organic Compounds (ppt)								
Perfluorobutanesulfonic acid (PFBS)		400,000	20	18.7	4.81 U	4.86 U	12.8	12.2
Perfluoroheptanoic acid (PFHpA)			3.33 J	5.17 U	4.81 U	4.86 U	4.96 U	4.86 U
Perfluorohexanesulfonic acid (PFHxS)			118	119	4.81 U	4.86 U	53.2	47.7
Perfluorohexanoic Acid (PFHxA)			19.1	17.5	4.81 U	4.86 U	4.96 U	4.86 U
Perfluorononanoic acid (PFNA)			4.84 U	5.17 U	4.81 U	4.86 U	4.96 U	4.86 U
Perfluorooctane Sulfonate (PFOS)	70		30.5	27.8	4.81 U	4.86 U	54.2	53.2
Perfluorooctanoic acid (PFOA)	70		43.7	45.3	4.81 U	4.86 U	7.72 J	8.07 J
PFOA + PFOS	70		74.2	73.1	NA	NA	61.9	61.3

Notes:

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Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	DAI for Altornata	DAI for Crowndowston	RW01	RW02	RW03	RW04	R\	N05	RW06
Sample ID	PAL for AlternateDrinking Water	PAL for Groundwater Plume Delineation	WI-A06-RW01-0218	WI-A06-RW02-0218	WI-A06-RW03-0218	WI-A06-RW04-0218	WI-A06-RW05-0218	WI-A06-RW05P-0218	WI-A06-RW06-0218
Sample Date	Drinking water	Plume Delineation	2/5/18	2/5/18	2/5/18	2/5/18	2/6/18	2/6/18	2/6/18
Chemical Name									
Volatile Organic Compounds (ppb)									
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U					
Semivolatile Organic Compounds (ppb)									
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.029 U	0.081 J	0.029 U	0.053 J	0.055 J	0.03 U

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1 x 10⁻⁵.

^cConcentration has been modified for an excess cancer risk of 1 x 10⁻⁴. Integrated Risk Information

System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

<u>Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water</u>

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be

accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and

Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name Sample ID Sample Date	PAL for Alternate Drinking Water	PAL for Groundwater Plume Delineation	RW07 WI-A06-RW07-0218 2/6/18	RW08 WI-A06-RW08-0218 2/6/18	RW09 WI-A06-RW09-0218 2/7/18	RW10 WI-A06-RW10-0218 2/12/18	RW11 WI-A06-RW11-0218 2/12/18	RW12 WI-A06-RW12-0218 2/12/18	RW13 WI-A06-RW13-0218 2/13/18
Chemical Name									
Volatile Organic Compounds (ppb)									
Vinyl chloride	2ª	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U
Semivolatile Organic Compounds (ppb)									
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.26	0.029 UJ	0.03 U	0.029 U	0.029 U	0.028 U

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1 x 10⁻⁵.

^cConcentration has been modified for an excess cancer risk of 1 x 10⁻⁴. Integrated Risk Information

System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

<u>Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water</u>

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be

accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and

Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	PAL for Alternate	PAL for Groundwater	RW14	RW15	RW16	R\	N17	R\	RW18	
Sample ID	Drinking Water	Plume Delineation	WI-A06-RW14-0218	WI-A06-RW15-0218	WI-A06-RW16-0218	WI-A06-RW17-0218	WI-A06-RW17P-0218	WI-A06-RW18-0418	WI-A06-RW18P-0418	
Sample Date	Drinking water	Traine Delineation	2/14/18	2/14/18	2/14/18	2/20/18	2/20/18	4/20/18	4/20/18	
Chemical Name										
Volatile Organic Compounds (ppb)										
Vinyl chloride	2ª	0.29 ^b	0.04 U	0.014 J	0.04 U					
Semivolatile Organic Compounds (ppb)										
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.029 U	0.029 U	0.03 U	0.031 U	0.1	0.11	

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1 x 10⁻⁵.

^cConcentration has been modified for an excess cancer risk of 1 x 10⁻⁴. Integrated Risk Information

System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

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ID = identification

J = Analyte present. Value may or may not be

accurate or precise

MCL = Maximum contaminant level

MTCA = Model toxics control act

PAL = project action level

ppb = parts per billion

U = The material was analyzed for, but not

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and

Drinking Water

Ault Field, Area 6, Naval Air Station Whidbey Island

Oak Harbor, Washington

Well Name	PAL for Alternate	PAL for Groundwater	RW19	RW20	R\	W21	21 RW		
Sample ID	Drinking Water	Plume Delineation	WI-A06-RW19-0318	WI-A06-RW20-0418	WI-A06-RW21-0818	WI-A06-RW21P-0818	WI-A06-RW22-0419	WI-A06-RW22P-0419	
Sample Date	Drinking water	Plume Delineation	3/28/18	4/20/18	8/27/18	8/27/18	4/17/19	4/17/19	
Chemical Name									
Volatile Organic Compounds (ppb)									
Vinyl chloride	2 ^a	0.29 ^b	0.04 U	0.04 U	0.04 U	0.04 U	0.05 UJ	0.05 UJ	
Semivolatile Organic Compounds (ppb)									
1,4-Dioxane	35 ^c	0.44 ^d	0.029 U	0.11	0.051 U	0.051 U	0.047 U	0.048 U	

Notes:

^aThe USEPA Federal maximum contaminant level

^bThe MTCA method B cleanup level, modified for an excess cancer risk of 1 x 10⁻⁵.

^cConcentration has been modified for an excess cancer risk of 1 x 10⁻⁴. Integrated Risk Information

System (IRIS). "1,4-Dioxane (CASRN 123-91-1)." USEPA (2013)

^dThe MTCA method B cleanup level

Shading indicates detection

Bolded text indicates exceedance of the PAL for groundwater plume delineation

<u>Underlined text indicates exceedance of the PAL for providing an alternate source of drinking water</u>

-- = no screening criteria available

ID = identification

J = Analyte present. Value may or may not be

accurate or precise

MCL = Maximum contaminant level

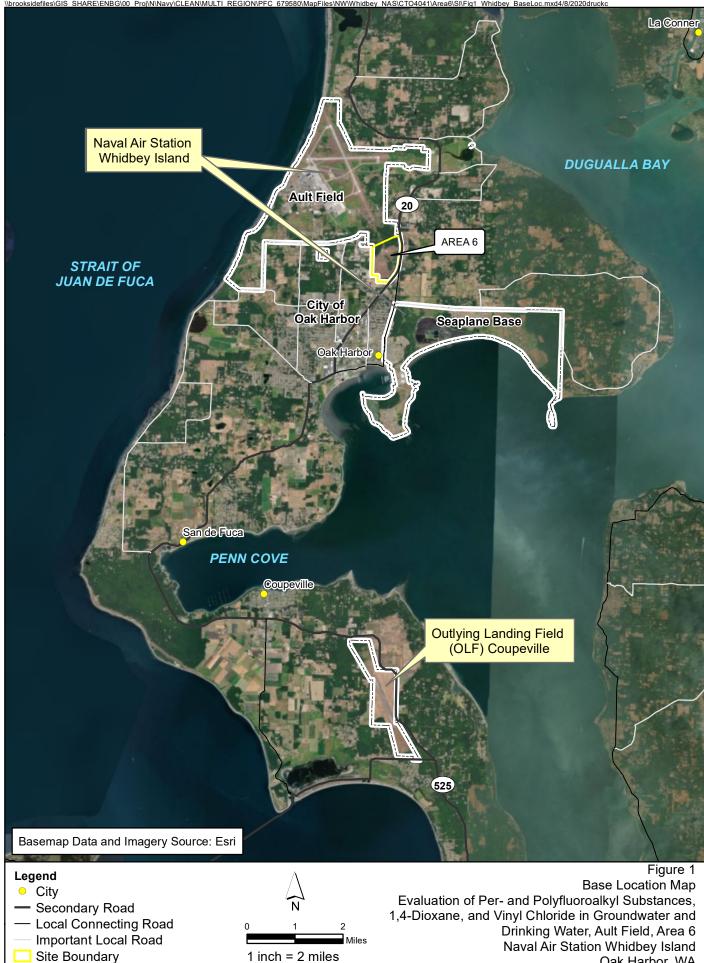
MTCA = Model toxics control act

PAL = project action level

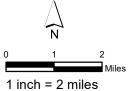
ppb = parts per billion

U = The material was analyzed for, but not

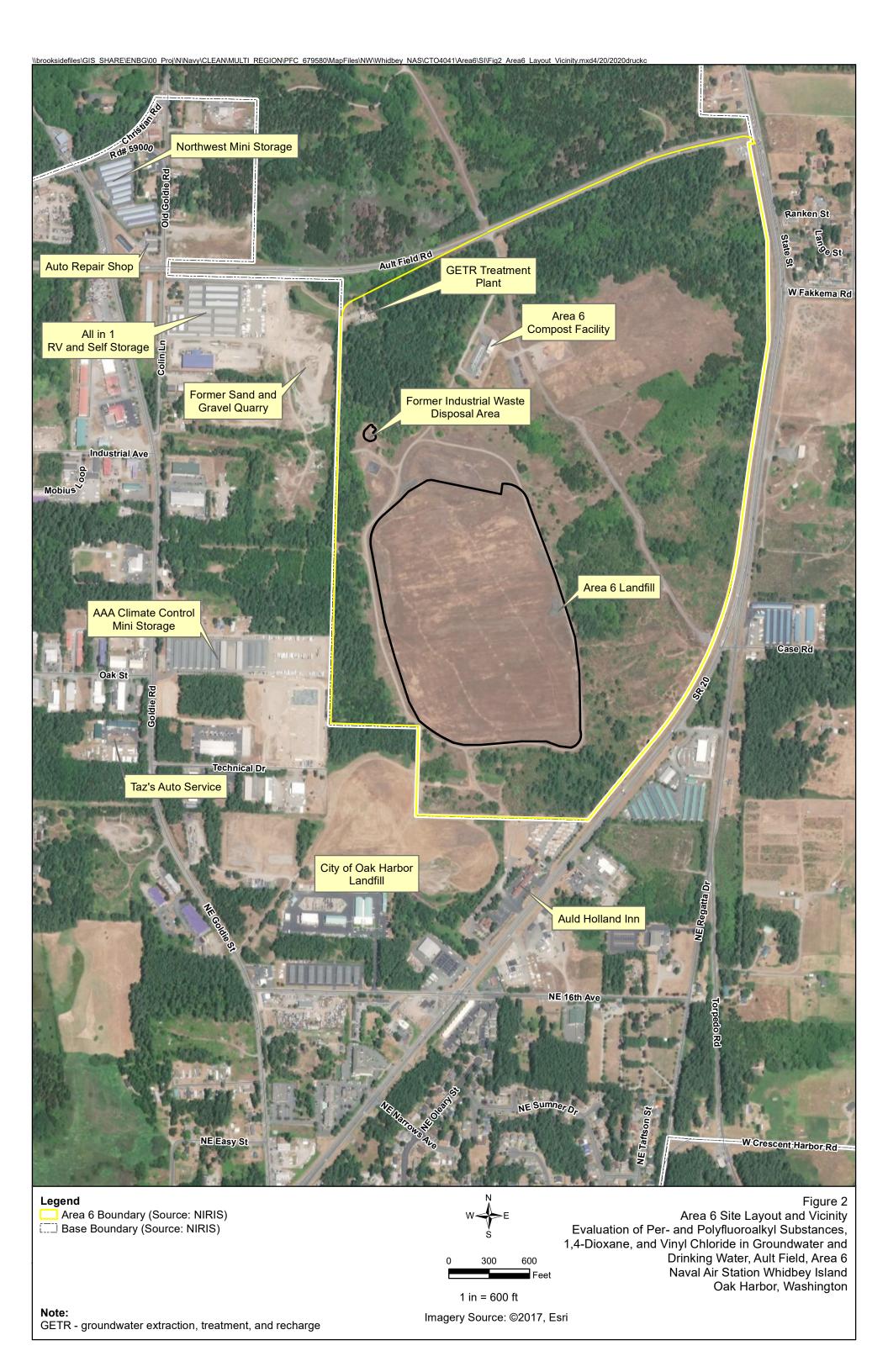
Figures

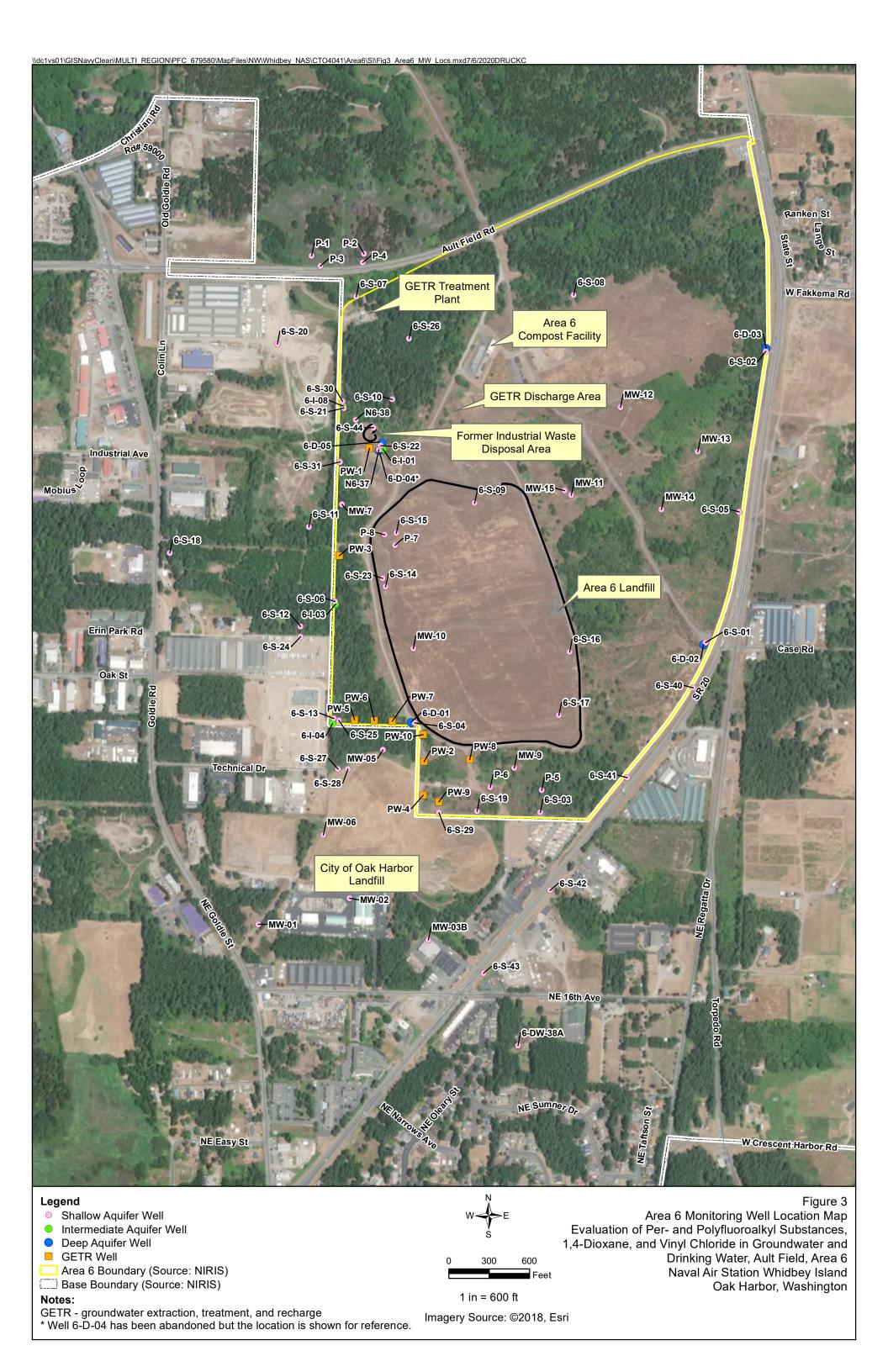


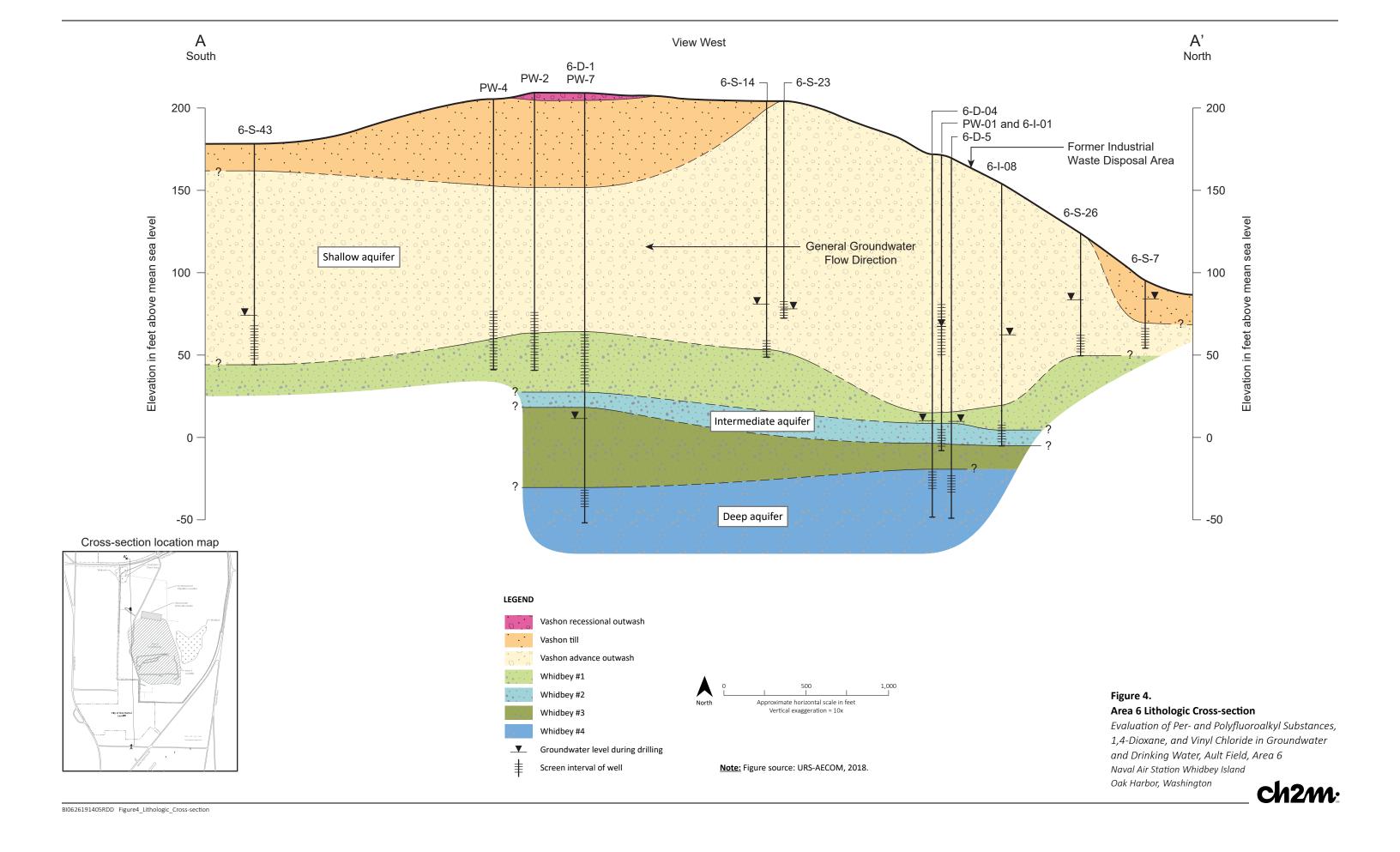
Base Boundary

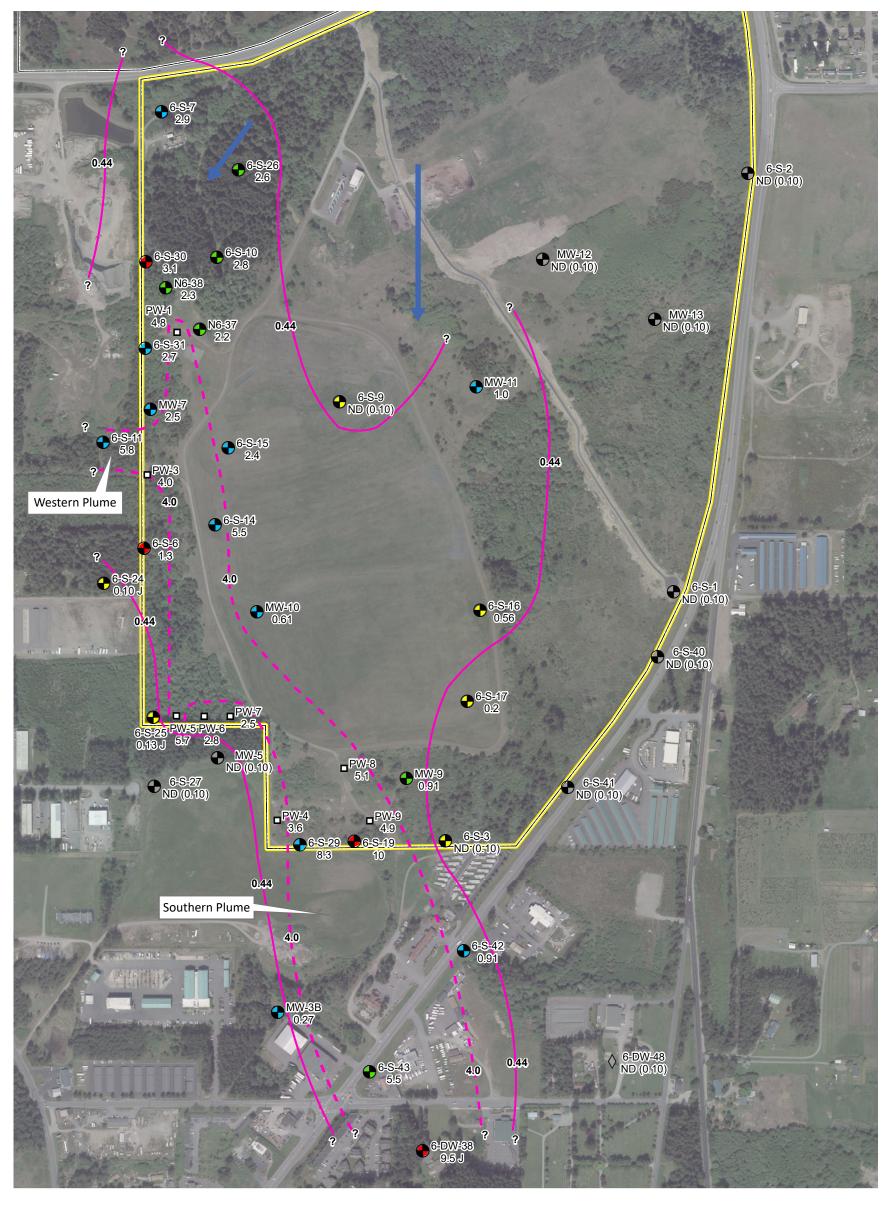


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LEGEND

- _0.44 _ Cleanup level contour
- -- 4.0 -- Concentration contour
 -- -- NASWI boundary

Area 6 boundary

Domestic well
Production well
Monitoring well

Monitoring well

Approximate groundwater flow direction in the shallow aquifer

Concentration Trends

No detections for all sampling events
Concentration is decreasing
Concentration is increasing

Concentration is increasing

No detections for all the last ten sampling events

No statistical analysis

No trend

Notes:

- 1. Concentrations are shown in micrograms per liter (μ g/L).
- 2. Results are qualified as noted:
 - J = Estimated value; the analyte is detected at a concentration below the quantitation limit or the result is qualitfied as estimated due to a QC outlier.
 - ND = Indicates analyte is not detected; the limit of detection is listed in parantheses.
- 3. Washington State MTCA Method B: 1,4-dioxane is 0.44 μ g/L.
- 4. Statistical analysis performed is the Mann-Kendall non-parametric trend test which requires a minimum of four data points, ideally less than 20% non-detect data, and measures if there is a trend to the data set (up to ten events through February 2018). The test determines if there is a trend and, if so, if it is increasing or decreasing with at least 80% confidence.

 5. Figure source: Sealaska, 2018.

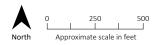
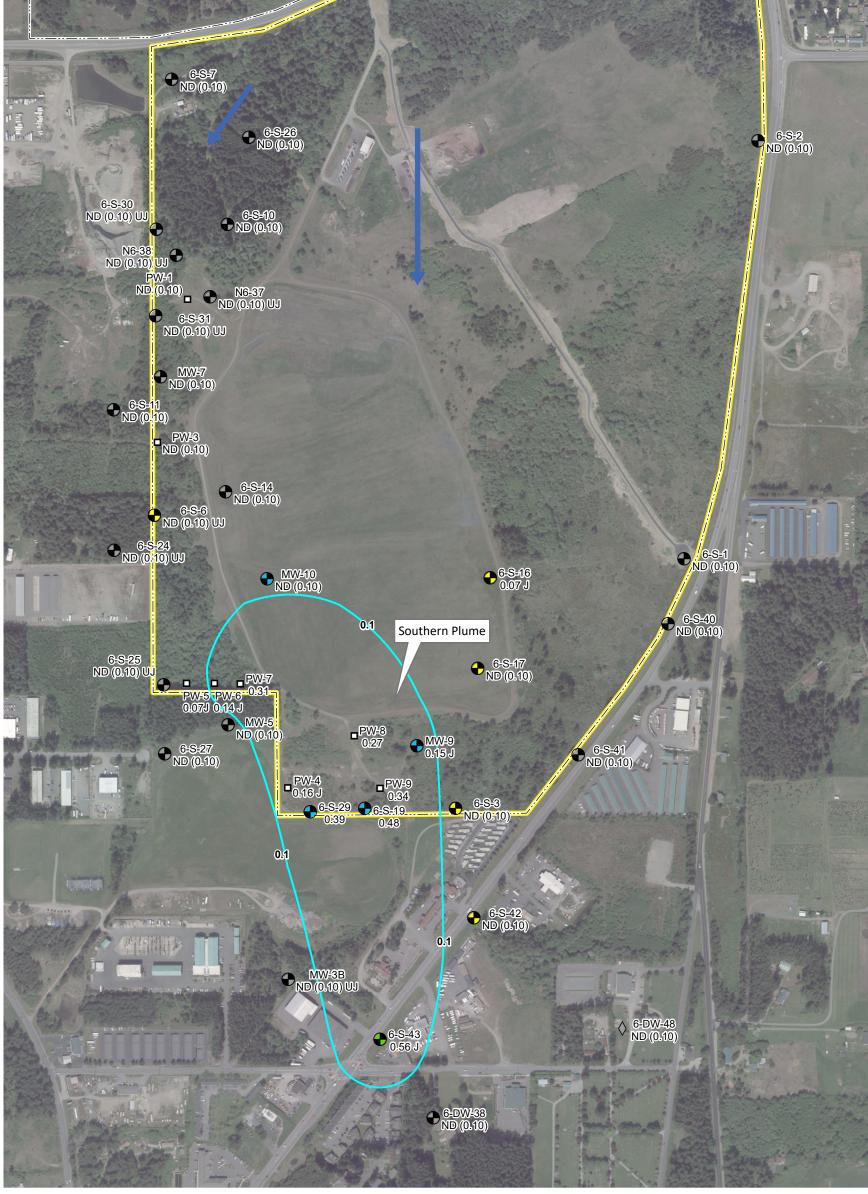


Figure 5. Area 6 1,4-Dioxane Groundwater Concentrations February 2018

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington



LEGEND

__ 0.1__ Cleanup level contour _____ NASWI boundary

Area 6 boundary

Domestic well

Production well

Monitoring well

Approximate groundwater flow direction in the shallow aquifer

Concentration Trends

No detections for a

No detections for all sampling events

Concentration is decreasing

No detections for all the last ten sampling events

No statistical analysis

No statist

Notes:

- Concentrations are shown in micrograms per liter (μg/L).
- 2. Results are qualified as noted:
- $\label{eq:Jacobian} J = \text{Estimated value}; \text{ the analyte is detected at a concentration below the} \\ \text{quantitation limit or the result is qualitfied as estimated due to a QC outlier.} \\ \text{ND} = \text{Indicates analyte is not detected}; \text{ the limit of detection is listed} \\ \text{in parantheses.} \\$

ND () UJ = Indicates analyte is not detected at an estimated limit of detection, which is listed in parentheses.

- 3. Compliance level for vinyl chloride is 0.1 µg/L.
- 4. Statistical analysis performed is the Mann-Kendall non-parametric trend test which requires a minimum of four data points, ideally less than 20% non-detect data, and measures if there is a trend to the data set (up to ten events through February 2018). The test determines if there is a trend and, if so, if it is increasing or decreasing with at least 80% confidence.
- 5. Well 6-S-11 is screened in the lower portion of the shallow aquifer, therefore results are not utilized for plume contouring.
- 6. Figure source: Sealaska, 2018.

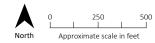
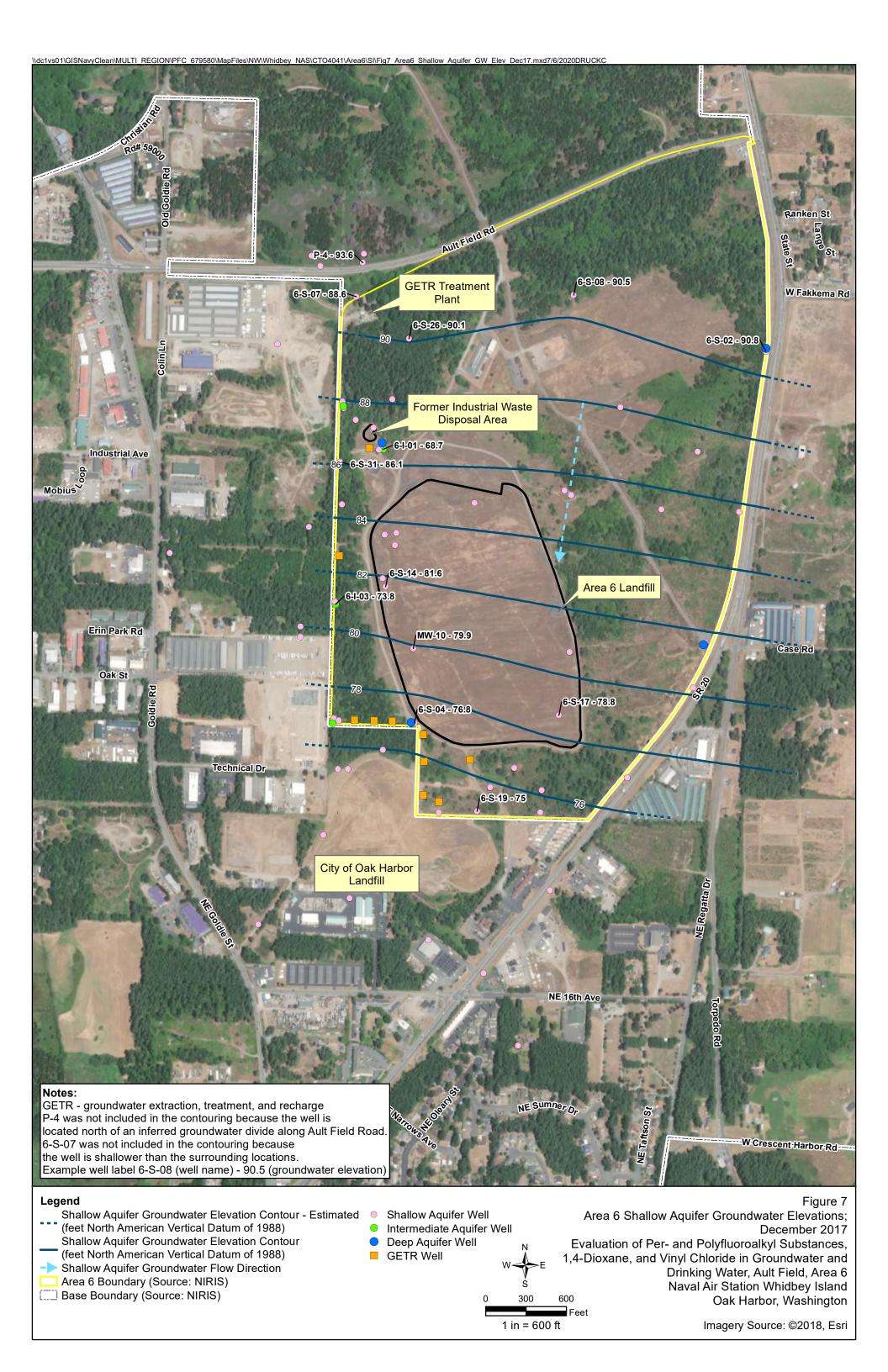
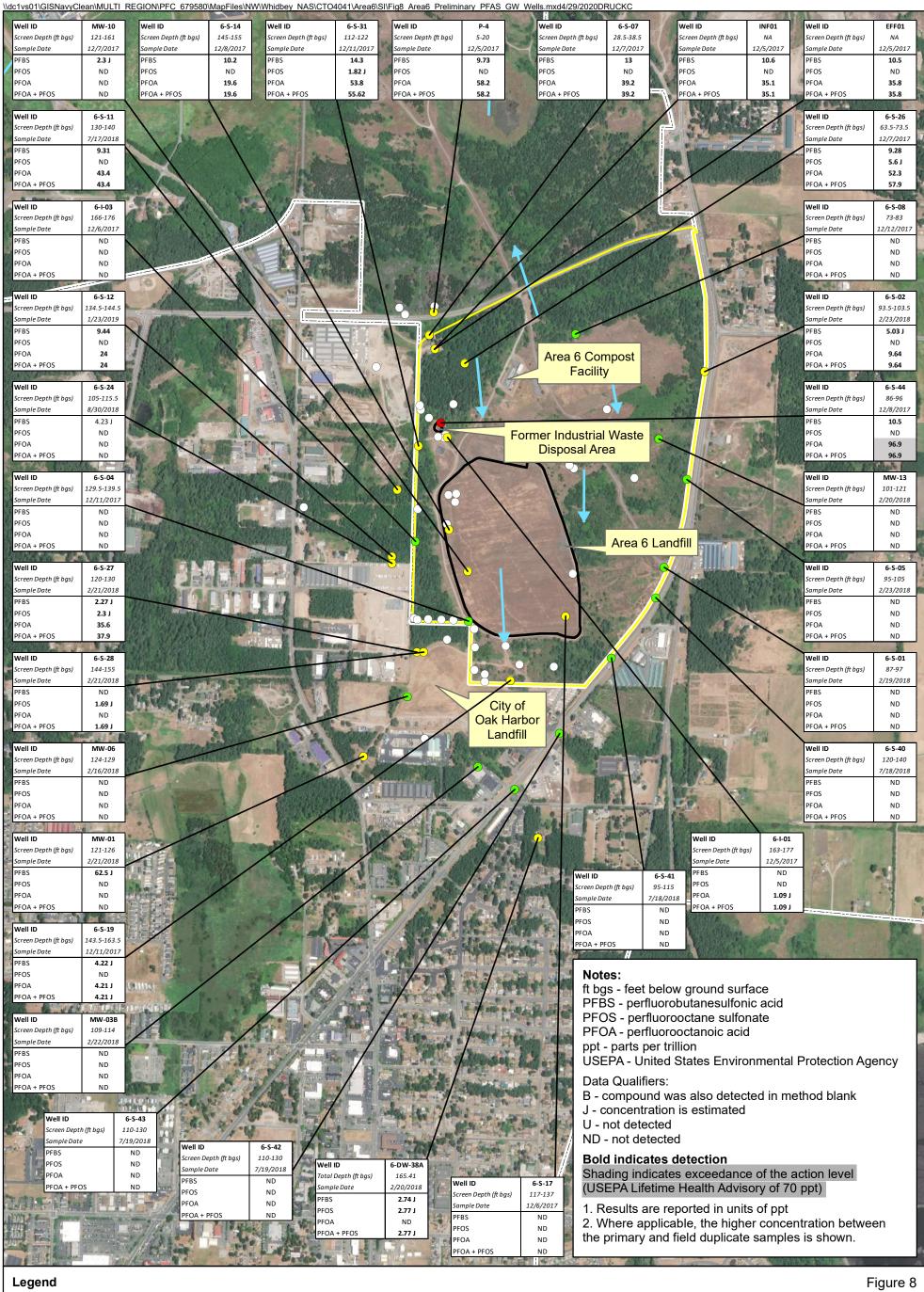


Figure 6. Area 6 Vinyl Chloride Groundwater Concentrations February 2018

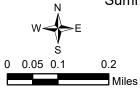
Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington





PFAS Sample Location

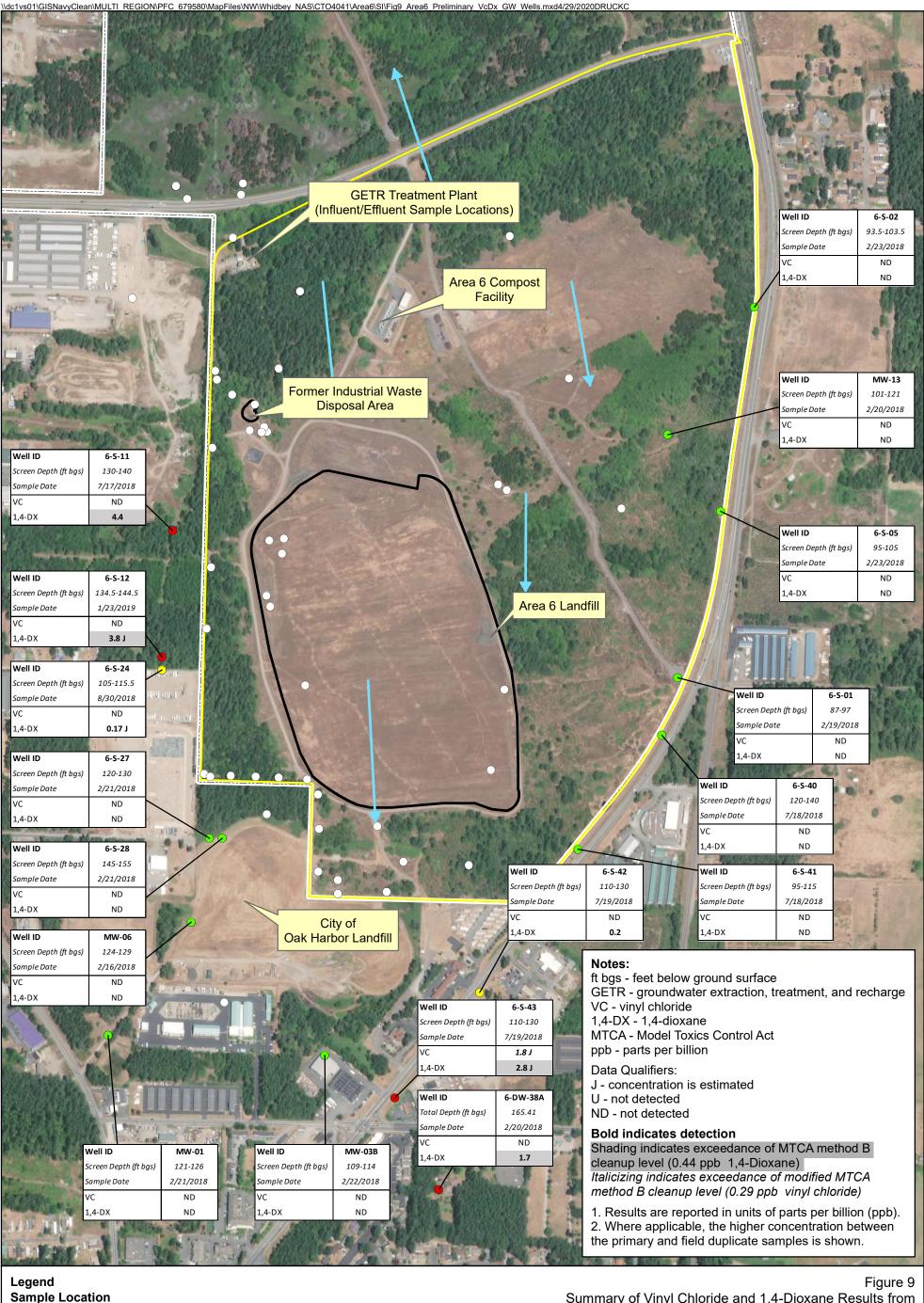
- Monitoring Well with Action Level exceedance
- Monitoring Well with no exceedance of Action Level
- No detections of PFOA, PFOS, or PFBS
- Monitoring Well Not Sampled
- Approximate Flow Direction in the Shallow Aquifer
- Area 6 Boundary (Source: NIRIS)
- Base Boundary (Source: NIRIS)



Summary of PFAS Results from Groundwater Monitoring Wells
Evaluation of Per- and Polyfluoroalkyl Substances,
1,4-Dioxane, and Vinyl Chloride in Groundwater and
Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Miles
Oak Harbor, Washington

1 in = 0.19 mile

Imagery Source: ©2017, Esri



Monitoring Well with Exceedance of the Action Level for Vinyl Chloride and/or 1,4-Dioxane

- Monitoring Well with no Exceedance of Action Level
- No Detections of Vinyl Chloride and/or 1,4-Dioxane
- Monitoring Well Not Sampled
- Approximate Flow Direction in the Shallow Aquifer
- Area 6 Boundary (Source: NIRIS)
- Base Boundary (Source: NIRIS)



0 0.05 0.1 Miles 1 in = 0.1 mile

Summary of Vinyl Chloride and 1,4-Dioxane Results from
Groundwater Monitoring Wells
Evaluation of Per- and Polyfluoroalkyl Substances,
1,4-Dioxane, and Vinyl Chloride in Groundwater and
Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island

Oak Harbor, Washington

Imagery Source: ©2017, Esri







Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington

NOTIFICATION: FIGURE 10 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

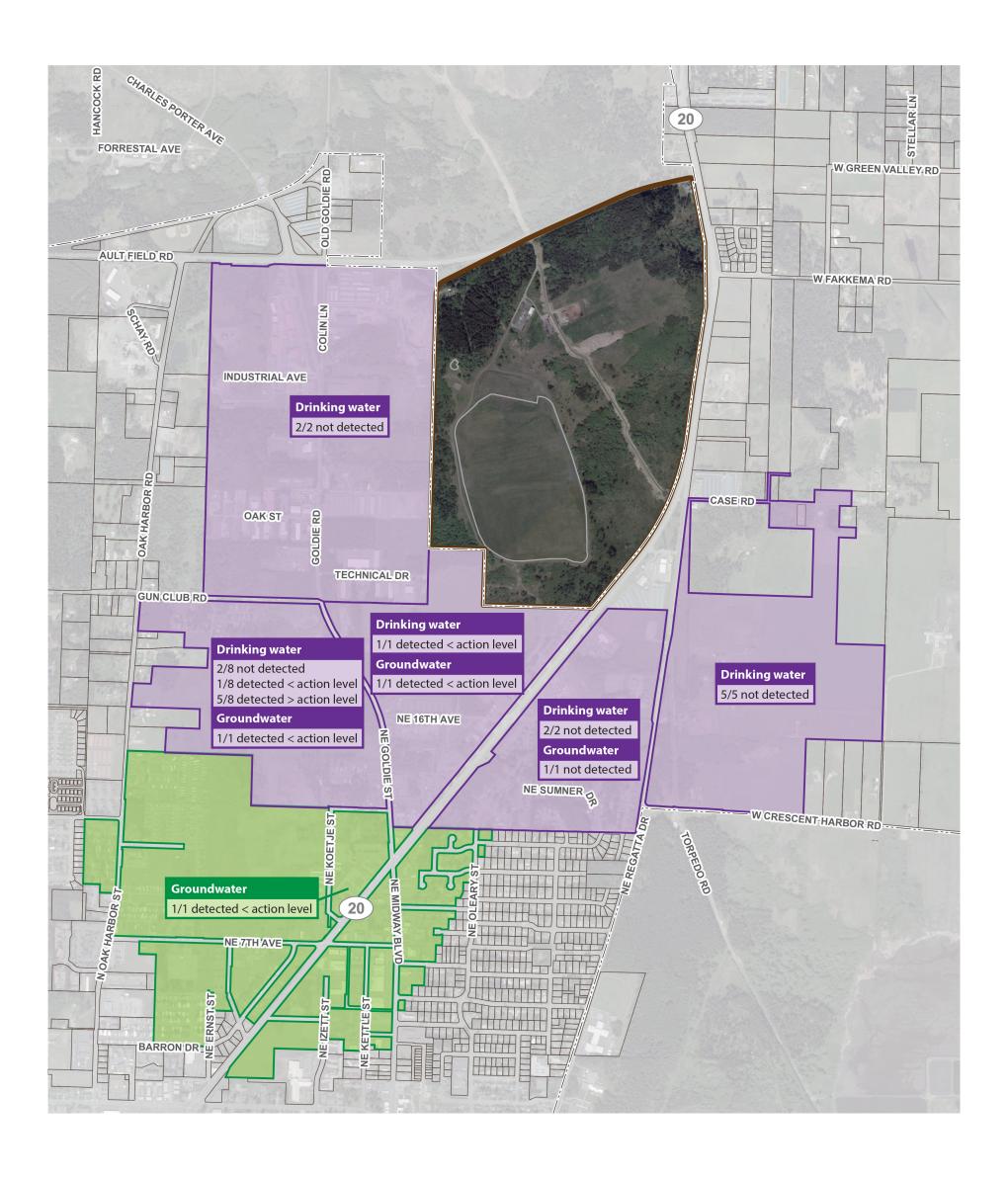
FOIA Exemption 6 (5 USC 552(b)(6))
Personal Information Affecting an Individual's Privacy

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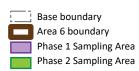
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Notes:

PFOS = perfluorooctane sulfonate PFOA = perfluorooctanoic acid

The action level for PFOS, PFOA, or PFOS + PFOA is the United States Environmental Protection Agency lifetime health advisory level of 70 parts per trillion.



Figure 10A. Summary of Off-Base Drinking and Groundwater Well PFOS and PFOA Results

Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6 Naval Air Station Whidbey Island Oak Harbor, Washington







Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington

NOTIFICATION: FIGURE 11 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

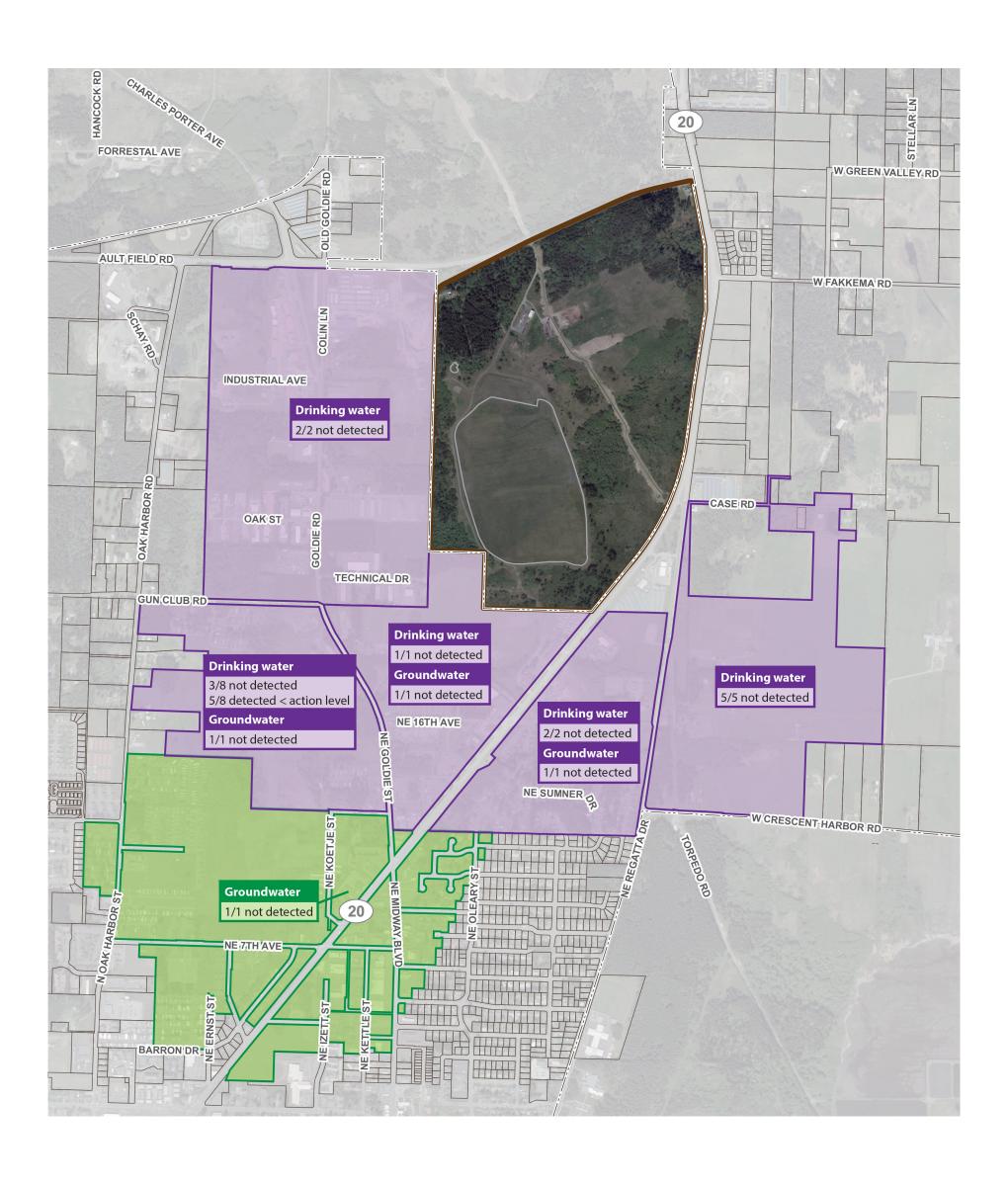
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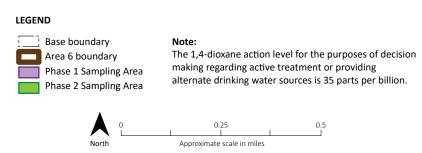


Figure 11A. Summary of Off-Base Drinking and Groundwater Well 1,4-Dioxane Results

Evaluation of Per- and Polyfluoroalkyl Substances,
1,4-Dioxane, and Vinyl Chloride in Groundwater
and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington







Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington

NOTIFICATION: FIGURE 12 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

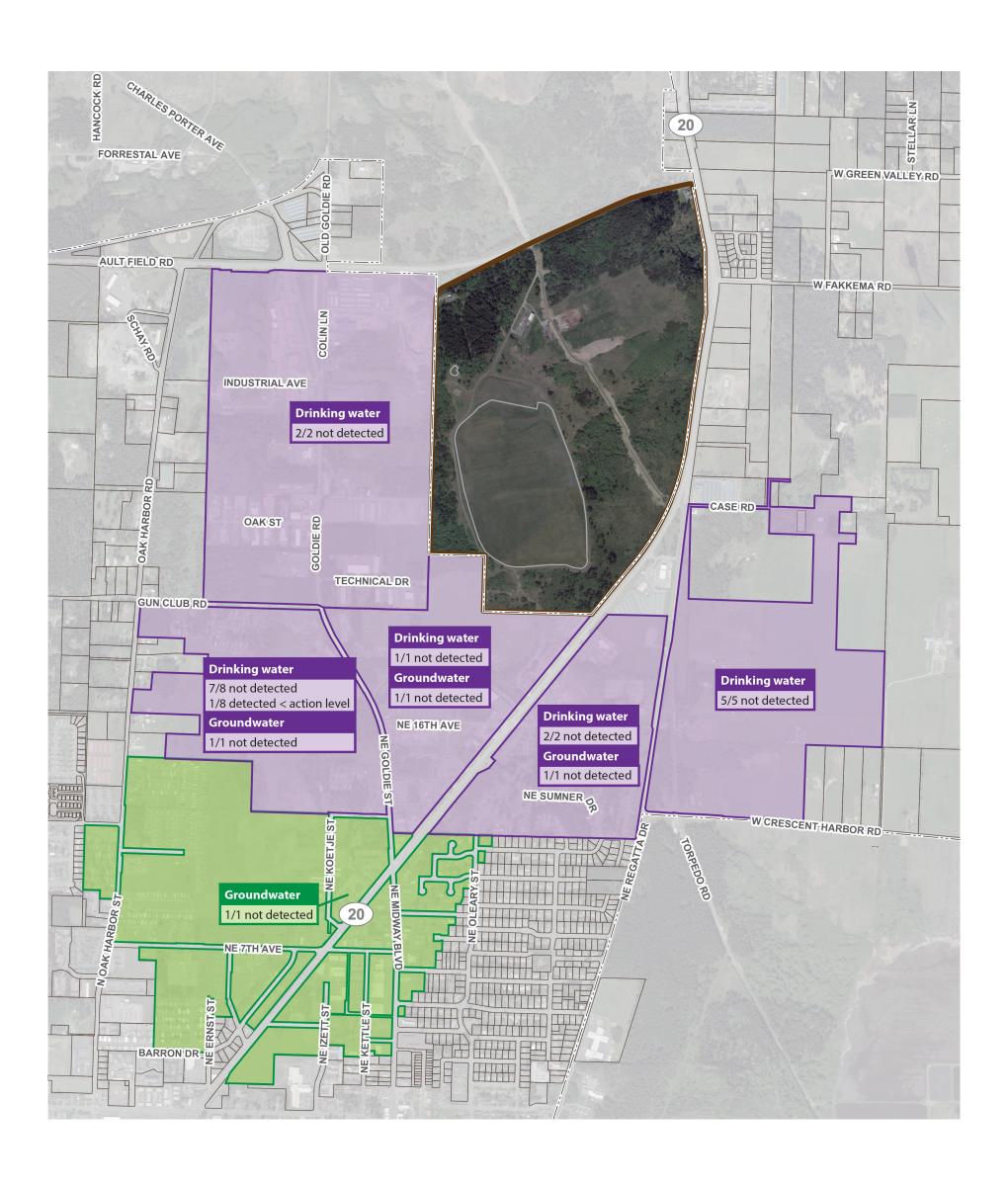
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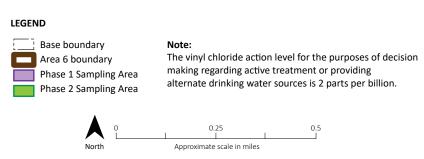
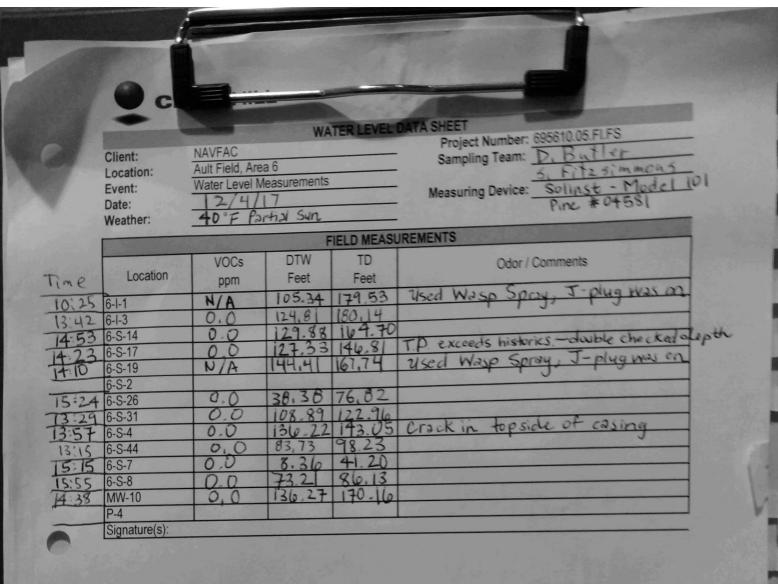
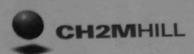


Figure 12A. Summary of Off-Base Drinking and Groundwater Well Vinyl Chloride Results

Evaluation of Per- and Polyfluoroalkyl Substances,
1,4-Dioxane, and Vinyl Chloride in Groundwater
and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington

Attachment 1 Groundwater Monitoring Well and GETR Sampling Forms





Weather:

WATER LEVEL DATA SHEET Project Number: 695610.05.FI.FS Sampling Team: D. Butler NAVFAC Client: Ault Field, Area 6 Location: Measuring Device: Solinst Model 101 Water Level Measurements Event: Date: (lear, 30-40", calm

	FIELD MEASUREMENTS											
Time	Location	VOCs ppm	DTW Feet	TD Feet	Odor / Comments							
	6-1-1											
	6-1-3											
	6-S-14											
	6-S-17											
	6-S-19											
07:50	6-S-2	0.0	92.78	105,45								
-	6-S-26											
	6-S-31											
	6-S-4											
	6-S-44											
	6-S-7			I Company								
	6-S-8											
	MW-10				The same Continue							
10:20	DA	00	3.12	120,67	Lock didn't open with well key. Casing &							

Signature(s):



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Client:	NAVFAC			Proj		695610.04.FI			of (
Location:						WI-AF-60	-1000 G	- DW - 38	9A
Event:	February 2018		r Sampling		Sample ID:	WI-AF 60	P wI-A	06-6-DW-	-38A-0218
Date:	2/20/1	8		Sam	pling Team:	D, But	ler		
Weather:	Cloudy	13017,0	alm	, p		L. Ba	umann		
Total Dept	th: (5	2.73	FT.(BTOC)			Me	easuring Device:	Hariba	4-53
Depth to v		117.38	FT.(BTOC)			1110	asaring Device.		121363
Water Col		5,35	FT.					FINE	F 21363
Water Con	(x)		GAL/FT.			Well Dia.	Volume		
Well Volum			GAL.			(inches)	(gallons/foot)	Gin	011
Total Purg	The state of the s	2520 GAL- 69		.1		1	0.041	0 (1)	well
Total Fulg	Je voi	520	- OAL.			1.25	0.064		
Purge Dev	vico:	Geotec	n PFC-F	ree		2	0.163		
ruige Dev			Pump #			4	0.653		
		nadaer	tranh +	4121		4	0.055		
					Control of the Contro	ZATION CRIT			
		Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Pa	rameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	
-	riteria	±0.1	±0.01 (if <1)	±0.05 (if <1)	±0.1	±10	±10 %	±0.3 (low flow)	
	riteria	10.1	±0.02 (if >1)	±0.2 (if >1)	10.1	±10	≤ 10 NTU	±0.3 (low llow)	
				Carlotte by the American American Control of the Co	FIELD PARA	AND DESCRIPTION OF THE PERSON			
Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	Color / Odor / Comments
	ml-(gals)-60	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	
1427	0	6.95	0.910	37,83	7.67	-116	15,1	117.49	elear, norder
1433	720	9117	0,944	2,43	7.68	-162	14.6	117.49	(1
1436	1080	9152	0.948	2.01	7.81	-179	11.9	117,49	(1
1439	1440	9,34	0,956	1171	7.78	-182	11.9	117,49	lı ·
1442	1800	937	0.957	1,59	7.85	oz 187	12:2	117.49	11
1445	2160	9,22	0.962	1.48	7.82	-189	12,7	117,49	11
1448	2520	9,24	0,963	1.41	7.85	=192	11.9	117,49	11
	All para		aple ex	- L	Temp n	hich 15	variable	due to	
	cutside	temp,	Procee	d .to 51	ample.				
_		- Contraction of the Contraction					100		
							DB		
	-		-						
Comple inf	formation, math.	ad containes		and horse no					
Sample ini	formation: metho		number, size,			T			
Ma	thed 53	7 Mod		Li C	rvative		Container requirer		No. of containers
114	8210	SIM		14			on L unpres	poly	2
Observation	one/Notoe: p		. / 1	(1)	01			Air Manitarina.	3
Observano	marivoles. De	dicated	Laping	ino le	flon li	inino,	Redeployed oxane) in	Air Monitoring:	HS BZ
82.66	a sampl	ing, Al	150 colle	eted 8	2705IM	11,4-Di	okane) in	VOC (ppm)=	0,0 0,0
2 11	L Ambers							H2S (ppm)	0,0 0,0
1	rt Time: 14							LEL (%)=	0.0 0.0
rump Sta	Initial Fill Tim	36		Final Fill Ti	me: 30		" '		
	Initial Dischar						LIC	02 (%)=	20.9
	IIIIIIai Discilai	ge Tille(DT	, 500). 4		Fillal Discil	arge Time:	13		
Pump End	d Time: [5]	16			Purge Rate	(20 mL/			
I dinp Line	15,	(5)			ruige Nate.	(20 mL)	min		
Pump Der	oth: 135 &	1							
		_							
Sample /T	ime: 145	5			100 100 100				
MS/MSD	1						Duplicate ID:	-	
Signature(s): Dair	Rath							

ch2m:

Chent: NAVFAC			ect Number: Well ID:		10,05,1	FIFS	
Event: Area 664			Sample ID:	6-I	A-06-19	H-12+70	WI-A06-6-10
Date: 12/3/17 Weather: (lear, 40')		Sam	pling Team:	D. Bu	+(er		
					t2 simmo		1 1 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Total Depth: 17 9.53 Depth to water: (-) 105,3	FT.(BTOC) FT.(BTOC)			Me	easuring Device: Date and Time:	WLI-SO	limit Model 10
Water Column: 74.17	FT.						
(x) 0, 653	GAL/FT.			Well Dia.	Volume	wa-t	Horiba U-57
Well Volume: 48, 43 Total Purge Vol.:	GAL.			(inches)	(gallons/foot)		
		-1 11		1.25	0.041		
Purge Device: Geote	ech PFC	Bladde	er	2	0.163		
				4	0.653		
			SAMPLE D	ATA			
Date: Temp		DO	рН	ORP	Turbidity	Other	Color (Color (Comments
Time: °C	mS/cm	mg/L	SU	mV	NTU	SANSI.	Color / Odor / Comments
Method:							
Purge Vol. Temp	Cond		IELD PARA		7 1 2 2		
Time Purge Vol. Temp	. Cond. mS/cm	DO mg/L	pH SU & \	ORP mV	Turbidity NTU	Other Dtw	Color / Odor / Comments
1411 initial 11.8	4 0,332	11.33	8.58	2(3	3,7	105.61	Clear, no oder
14:16 750 11:44		9,90	8.49	220	3.9	105.61	8.6
1421 1500 11.34	0.326	9.03	8.49	217	3.8	105.61	- 15
1431 3000 11.13	0.325	8.46	8.38	211	3.5	105.61	44
1436 3250 11.0		8.33	8.31	210	20	105.61	44
14:41 4000 10.7	3 0.325	8.28	8.29	204	2.3	105,61	10
Sample information: method, contain	ner number size	and type pre	servative use	d			
Analysis	nor nambor, dizo		rvative		Container requirer	nents	No of containers
Method 537			00		125 ml 40	spr4s	2
Method 537	TOP	4	00			pres	4
Observations/Notes:	Maria A	113.53 256			-		
Pump Start Time: 1355		VOC Bondin	16	t	ime flow	v Rate	
PumpEnd Time: 1454		VOC Readin	a: 0.0	rpm 1	ime Flow	OmL/min	
Pump End Time: 1454 Pump Depth: 170 f							
Sample /Time: 1445				-			
MS/MSD NA	-0	Duplicate ID	No: NA				
ture(s): Doctor	The state of						

ch2m

Date: 12/06 Weather: Portial S Total Depth: 18 Depth to water: (i) Water Column: 5 Well Volume: 3 Total Purge Vol.: 6	NAVFAC Thor (0 /17 Sun, High 30°F 30, 14 FT.(BTOC) 124.92 FT.(BTOC) 5,22 FT. 0.653 GAL. 2.05 GAL. 7eotech PFC	Project Nu Sampling	Well Dia. (inches) 1 1.25	3 A06-6-I- Rutter/S A Fitzsim easuring Device:	03-1217 SEA mons /RDM	C-102928 Mod
			IPLE DATA			
Date: 17/6/17	Temp. Cond.	DO p	The state of the s	Turbidity	Other: DTW	Color / Odor / Comments
Time: 093'5	°C mS/cm	1 1	U mV	NTU NTU	± 0.3ft	California de la Califo
Method: Stabalization	n = 0.1 = 0.0	10,2 50	1 = 10	N/A	- 0.330	
	A front of the		PARAMETERS	Turkiditu	OthorPTW	
Time Purge Vol.	Temp. Cond.		H ORP	Turbidity NTU	Other:	Color / Odor / Comments
Jeas)"—	°C mS/cm		0 296	07	124 80	clear, nooder
inita + 07:41	9.97 0.303		35 85	0.4	124.80	11 11
01:46 150	991 0,314		6 13	0.5	124.80	4 11
2 250	10.04 0.316		35 -11	0.6	124.80	11 11
10:01 2 000	10.14 10-316	7.82 7.9		0.5	124,80	(())
10:00 3750	10.08 0-316		60 -53	0.6	124.80	(1 11
10:11 4500	10.02 0.317	13.71 7:	68 -62	0.3	124.80	61 11
10:16 5250	10,00 0.31+	7.80 7.	72 -68	0.8	124.80	11
10:21 6 000	10.06 0.318	165 1	79 -81	0.6	124.80	u
10:26 6750	10,07 0,319	345 1	80 - 88	0.5	124.80	u
10:31 7-500	od, container number, size	and type, preservat				
	lysis	Preservative		Container requiren	nents	No. of containers
Metho		400		5ml unp		2
Method	537 TOP	· 4°C	12	5 ml unpr	-63	4
						Maria Salara
		-				
Observations/Notes:	c Il—tesa	Time: 60	Purged	for 1	time i F	Flow Rate
Opper Administrations.	Edlection		Turged	101	Citie	
Pump Start Time. 69	:12	VOC Reading: O	10 ppm 31 h	nour, Most	09.43	150 mL/min
Pumperd Time:			Lare	ins, stable,		The second second
Pumb Depth: 173 f	t btoc		A STATE OF THE PARTY OF THE PAR	coed to 1		
Sample /Time: 101.3	5		Sam	ple.		
Sample /Time: 10.5	,	Duplicate ID No.:	NA ;		THE RESIDENCE	
msmso p	N D 110.					
Day	4 butte	5-33 5 6 -4- 1 3 5 E				



		SM		GROUNDY	WATER SAME	PLING DATA	SHEET		
Client:		NAVFAC		THE PERSON NAMED IN COLUMN TWO	ject Number		NA TORRESPONDENCE DO COMPANSO	I,F5	
Location:	Oak Ha	rbor, n	A	_	Well ID	6-5-	1		
Event:	Area 6	Off Bag	10			wi-A		-0218	
Date:	2-19-18		-	Sai	mpling Team	: L. Bouma	ะกท		
	Sun. 30° F		_			D . But			
Total Depth			ET (PTOC)					i.ii.	
Depth to wa		90.50	FT.(BTOC)			, Mi	easuring Device:		
Water Colu		7 1	FT.(BTOC)				Date and Time:	2/19/18	
water Colu	-	0.653	GAL/FT.			Well Dia.	Volume	1	
Well Volum		4.83						1	
Total Purge		675	GAL.	ters		(inches)	(gallons/foot) 0.041	-	
rotar range						1.25	0.064	1	
Purge Device	ce. (-00)	toch Pfi	C-Free F	Sladder:	#6(3)	2	0.163	1	
. u.go bovii	. O t <u>-</u>		111	14000		4	0.653	1	2 11
							0.000	J	250 Min
					SAMPLE	DATA			
Date: 2-	19-18	Temp.	Cond.	DO	pH	ORP	Turbidity		
Time:	25	°C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Comments
Method:		+ 1	+ .	+ .2	+ 1		1110		
Wethou.		1	1-,01	: 2		±10			
	Dunna Val	T	Loui		FIELD PARA		<u> </u>		
Time	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	Other: DTW	Color / Odor / Comments
1132		11,64	mS/cm	mg/L	SU	mV	NTU 4,93	44 ptoc	
1135	0.75	11,20	D.461	10.91	6,20	137		90:49	
1138	2.25	11 22	0.484	7.91	6.82	107	4.51	90:50	1
11 58	4	11.22	0.484	7.11	7,24	92	4,35	90.46	
1144	4.75	11.18	17.486	7.28	7,30	75	3.09	90.46	
1147	5.5	11.19	0.485	7,06	7,31	72	2.61	90.50	
1150	6.75	11.06	0.484	6.99	7.37	69	. 35	90,48	
1130	0.73	11.06	0:131	0.77	1131	0 1	105	40,78	
7			1					 	
			<u> </u>						
Sample infor	mation: metho	od, container	number, size,	and type, pr	reservative us	ed.			
	Anal				ervative		Container requirer	ments	No. of containers
9	1260 SI	M							
2	3270 51	M							
							-		
		- 11-							
Observations	s/Notes: Non	- Tetlin L	ined ded	icated Tu	ibing				
						1 . P	7		
Pump Start	Time: 112	20			ng: Norm				
Dump Darth	ilme il	21.400		Dool	DTIN-	GAILL	ft bloc		
rump Deptr	1: 96 #	MICC		a ind	10 -	10.47	1100		
Sample /Tim	1000								
MS/MSD IA	1e: 1200	-01-016	SIMSE	Dunlicate ID	No: W.T.	1006-1	-01P-0218	at 1210	3
Signature(s):		Bitto	100	Duplicate ID	110	100	1-011 0216	at 1211	



Client: Location:	NAVFAC NASWI Area 6				ect Number: Well ID:		I.FS Z	Page:	of
Event: Date:	Area 6 Off-bas			Sam	Sample ID:	WI-A06- 6	-5-02-021 nann, E.	3	
Weather:	Snow		0'5	- 0411	ipinig realii.	b. Oan	mann, E.	Cotter	
Total Dept Depth to w Water Col	h: vater: (-)	104	FT.(BTOC) FT.(BTOC) FT.			Me	easuring Device:		53 Bladder fung
Well Volur Total Purg Purge Dev	me: e Vol.:		_GAL/FT. _GAL. _GAL.			Well Dia. (inches) 1 1.25	Volume (gallons/foot) 0.041 0.064 0.163		
						4	0.653		
			到有指点 // 19	PARAMET	ER STABILIZ	ZATION CRIT	ERIA		
		Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Par	ameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	
Ci	riteria	±0.1		±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % ≤ 10 NTU	±0.3 (low flow)	
			100克。		IELD PARA	METERS		The Control of the Co	
Time	Purge Vol. (gals) (L)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
1335	1,50.	10.39	0.291	7.31	3,24	530	3.6	92.54	Clear, no odor
1337	1.90	10.37	0.292	6.72	8.20	227	4.6	92.54	11
1341	2.30	10.31	0.293	6,30	3,24	225.	510	92.54-	11
1343	3,10	11,13	0.291	5.98	8.19	274	5.0	72.54	"
1345	3.50	11,25	0.290	5.71	3,13	222	5,4	92.54	"
1347	3.90	11,25	0.290	5,70	8 19	224		92.54	1'
1349	4.30	11,19	0.291	5.66	8,19	220	47	92.54-	//
Sample info	ormation: metho	nd container	number size	and type are			62 100 = 2 0 42 ± 11		
ouripic iiiic	Anal		number, size,	Preser			Containor requirem		
	7 (1)	7010		1 16361	valive		Container requirem	ients	No. of containers
									>
Pump Dept Sample /Tir	Time: 131 Initial Fill Time Initial Dischard	e(FT; sec): / ge Time(DT;	sec):/5		Final Fill Tim	ne: 15 rge Time: 5	2	Air Monitoring: VOC (ppm)= \times H2S (ppm) \times LEL (%)= \times CO (ppm)= \times O2 (%)= \times \times \times	
MS/MSD							Duplicate ID:		
Signature(s)	:								

ch2m: GROUNDWATER SAMPLING DATA SHEET Project Number: 695610.05. FI. FS **NAVFAC** Well ID: 6-5-04 Location: Oak Harbon, WA Sample ID: WI - A06 - 6 - 5 - 04 Area 6, GW Sampling Event: Sampling Team: Shannon Fitzsimmons /ROD Date: 12-11-17 ID-2744 David Butler / SEA High: 49°F Weather: Calm, Low: 30°F u-500 Measuring Device: Horiba 3,05 FT.(BTOC) 35,40 FT.(BTOC) Total Depth: 08:20 Date and Time: 12 - 11 - 17 Depth to water: Water Column: 1,15 FT. Volume (x) 0.653 GAL/FT. Well Dia. Well Volume: 4 67 GAL. (inches) (gallons/foot) 0.041 1 Total Purge Vol.: GAL. 0.064 1.25 Geotech PFC-Free Bladder 2 0.163 Purge Device: 0.653 Pump #5882 SAMPLE DATA DO ORP **Turbidity** pΗ Date: 12 -11-17 Cond. Temp. Color / Odor / Comments Other: NTU Time: 08:20 SU m۷ °C mS/cm mg/L Method. Stabilization ±0.1 ± 10 ± 0.1 1001 ±0.05 N/A FIELD PARAMETERS 10 m 10 m **Turbidity** ORP Purge 49 Cond. DO pΗ Other: DTW Color / Odor / Comments Time °C SU NTU (gals) mls mS/cm mg/L mV ft btoc 135.90 135.90 135.90 09:45 0,489 6.77 267 Clear, no odor initial 8.48 0.00 4.6 0950 7.5 0.490 500 3,00 7.08 116 1) 1.0 0.00 1000 0.500 7.13 135.90 V 0.00 10,+ -29 C 1500 .57 0.511 7.05 0.509 11 86 -38 8.7 C 10105 2000 0.00 9.6 -34 " 37 7.6 135,90 2500 0.508 0.00 10:10 Sample information; method, container number, size, and type, preservative used.

Method Analysis Preservative Container requirements No. of containers 4°C 537 125 m L unpres. poli Method TOP 4°C Method 125 ML uniones. Observations/Notes: Had difficulty pulling up water, most likely due time
Pump Start Time: 09:00 VOC Reading: 0,000000 09:50

Flow Rate(mL/min) 100

Pump End Time: 10:21 Pump Bepth: 139,5 ft bloc Da Co

- Collected Sample without temp. Stabolized. All other parameters met conteria.

Sample /Time: 10:15 MS/MSD

Duplicate ID No.: N/A



				GROUNDW	ATER SAMP	LING DATA	SHEET		
Client:	NAVFAC			Proj	ect Number:			Page: /	of
Location:					Well ID:	6-5-0	5		
Event:	Area 6 Off-bas	se Sampling			Sample ID:	WI-A06-6	5-05-0218		
Date:	2-23-1	7		San	pling Team:	E. Cutte	r, L Bauma	7 1016	
Weather:	Clouds	, low 30's	, Some wi				1 - 1 - 1 - 1		
Total Dep)	/							
		106	FT.(BTOC)			M	easuring Device:	A	3
Depth to Water Co		96,46	FT.(BTOC)					Geotech	Bladder Primp
water co			FT.			- W U D:	1	1	1
Well Volu	<u>(x</u>		GAL/FT.			Well Dia.	Volume	146	
Total Pur	D/Entrances		_GAL. GAL.			(inches)	(gallons/foot)	-	
Total Ful	ge voi		_GAL.			1	0.041	-	
Purge De	vice:	70.	1.1 0.	01 1	1 0	1.25	0.064		
i dige be	vice.	100 (0.17	6979	o Blado	10 VE	2	0.163	-	
	pul	My . C-1	02/6			4	0.653	The same of the sa	
				PARAMET	ER STABILI	ZATION CDI	TEDIA	Contract Con	The force of the second second second
Control of the Contro	CHARLES CONTRACTOR OF THE STATE	Temp.	Cond.	DO	pH	ORP	Turbidity	DTW	
Pa	rameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	2
				±0.05 (if <1)		IIIV	±10 %	ILBIOC	
	riteria	±0.1		±0.2 (if >1)		±10	≤ 10 NTU	±0.3 (low flow)	
e in the			1±0.02 (11 > 1)		FIELD PARA	METEDO	_ ≥ IUNIU		
DELT A REPLECTE	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	DTW	The second secon
Time	(gats)	°C	mS/cm	-	SU	I SAMESA	Turbidity		Color / Odor / Comments
1015	7 0	1096	0, 423	mg/L	1 67	mV	NTU	ft BTOC	
1017	3.4	11,24	0.416	597	7.87	227	58,3	96.46	Lt. Brn. Foda
10/19	3,8	11.40	0.414	5.69	1,99	227	59.8	T _I	11
10 21	42	11,20	0.414	5,42	8.19	224	5(1)		
1000 >	4.6	11:48	0 413	5116	814	228	40,1	96.46	
1025	5.0	11.36	0.413	5.19	8,29	224	37.6	16.76	
1027	54	11.51	0.412	F-10	3:26	728			
1079	5.0	11:38	0.412	5110	9.39	226	37.2	· ·	
1071	62	11.56	0,409	4,98	8.39	226	26.5	U	
1033	6.6	11.49	0:410	5-103	8.42	228	26.6	le .	
1	Stalmi	1,702	1	3.03	2 . 10	200	0.0		
Sample int	formation: method	od, container	number, size.	and type, pre	servative use	d		PART TO SERVICE AND	
		alysis			rvative		Container requirer	nents	No. of containers
						77.02.77		1101110	140. Of Containers
- must									
Observation	ons/Notes:			Markova III - Markova				Air Monitoring:	7
								VOC (ppm)=	
Pump Sta	rt Time: 095	5						H2S (ppm)	
	Initial Fill Tim				Final Fill Tir			LEL (%)=	
	Initial Dischar	rge Time(DT	; sec): (5		Final Discha	arge Time:	5	CO (ppm)=	
						57		02 (%)=	
					Purge Rate:	200 00	1		
-	100					Lou it	- nun		
	oth: [00"					-			
	1035								
Sample /T	ime: 10 35								
MS/MSD							Duplicate ID:		
Signature(s):								

gh2m:

11:09

NAVFAC	Project Number:		10,051	エルトラ	
Location: Oak Harbor, WA	Well ID:	6-5-	7		1 - 1 - 1 - 1 - 1
Event: Area 6 GW Sam	Sample ID:	WI-A	06-6-5-	07-1217	/- TOP/-MS/-SI
Date: 12-07-17	Sampling Team:	DiBut	98		
Weather: Clear, 30°F, Calm		5. Fit	Zsimmon	1	
Total Depth: 41.20 FT.(BT	000	Mo	seuring Davica:	Harla 12-	-52 C10292
Depth to water: (-) 5.34 FT.(BT		IVIE	Date and Time:	HUMBS U	10:50
161	00)		Date and Time:	12/07/17	10.50
	T .	Well Dia.	Volume		
	1.				
		(inches)	(gallons/foot)		
Total Purge Vol.: ~8.5 GAL.		4.05	0.041		
Duran Davis	FG Free Bladder	1.25	0.064		
Purge Device: Geotech P	FG Fite bisader	2	0.163	120 6 34 35	
		4	0.653	1999	
	CAMPIE	DATA			
Deter 12 m3 13 Tems Co	SAMPLE		Turbidity		
Date: 12 - 07 - 17 Temp. Co		ORP	Turbidity	Other:	Color / Odor / Comments
Time: 10:50 °C mS		mV	NTU		
Method: Stabalization +0.1 +0	.01 ±0.2 ±0.1	10	N/A		
A STATE OF THE STA	FIELD PARA	METERS	Service Control		2. *** *** *** *** *** *** *** *** *** *
Purge Vol. Temp. Co	nd. DO pH	ORP	Turbidity	au may	01 101 10
I lime I	/cm mg/L SU	mV	NTU	Other DTW	Color / Odor / Comments
10 55 inital 10.55 0.7	52 20,01 7.28	-94	2.3	8.45	Clear, No odar
11 00 2250 10.58 0.3	165 12.19 7.47	-119	1.8	8.43	11 11
5000 10.44 ()	64 10.49 7.47	-120	1.6	8.43	11 11
6750 10.34 O.	64 9.31 7.48	-122	2-0	8.43	- 4 "
1115 9000 10.35 0.3		-123	3.2	9.43	1 1
0 00 00	167 8.36 7.51	-1)4	3.8	9.43	11
11,20 1230 130.	1 4 4 4	-12-3	1.2	8.43	11
1100000	W 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	-123	4.4	8.43	11 11
11 30 14850 10.24 0,3	1 7 7 7 7 1 4	-124	4.5	8.43	11 11
11.35 17-100 10.30 0.7	2 1 11				11 11
11:40 19350 10.37 0.7		-125	4.6	8:43	"
		1-125	170	10173	
Sample information: method, container number			Container require	monto	No. of containers
Analysis	Preservative 4°C		Container require	THE RESERVE THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUMN TWO I	
Method 537				pres. poly	
Method 537 TOP	4°C	12	5mL vi	i pres. boly	1 -
	Maria Sharan Sharan An			0	
				No. of Concession, Name of Street, or other party of the Concession, Name of Street, or other pa	
				The state of the state of	
Observations/Notes; Pump stoffed a-	tea times during p	ourge de	ie to	time	Tow Rate 150 mL/min
bed connection with DC	plug:			10.55 4	F50ML/min
Pump Start Time: 10 50	VOC Reading: O.O	ppm		10:23	30 11-711110
Pump Start Time: 10:50 Pump End Time: 1156				365 To 1971	
Pump Depth: 35 Ft 6toc				100	
Sample Time: 1150				THE RESIDENCE	
MCMCD WI-ADE-6-7-WI-MS	/-5 Duplicate ID No.: NF	1			
ture(s): Swa B. II.					
POUCH BUILD					

GROUNDWATER SAMPLING DATA SHEET

ch2m:

		GROUNDWAT	TER SAMPLI	ING DATA SI	HEET				
Crient: N/	AVFAC	Projec	t Number:	69561	0.05.FI	.FS			
Location: Oak Harb	or, WA		Well ID:	6-S-08					
	GW Sampling	1	Sample ID: WI - A06-6-5-08-1217/-T			-/-TOP			
Date: 12-12-17		Samp	ling Team:	Shanno	on Fitzsin	mons/RD	Ď		
Weather: Calm, S.	unny 38°F			navid Butler 1.SEA					
Total Depth: 86	FT.(BTOC)			Mos	seuring Davice:	Horiba 11-5	500 10-27	447	
	73.14 FT.(BTOC)								
14/ 1 0 1	2, 94 FT.			Date and Time: 12-12-17 0840					
	91653 GAL/FT.		Г	Well Dia.	Volume				
	3.45 GAL.		1	(inches)	(gallons/foot)				
Total Purge Vol.:	CAL.		t	1	0.041				
				1.25	0.064				
Purge Device:	cotech. PFC-	free Bla	lder 1	2	0.163				
D.	cotech. PFC-	,		4	0.653				
ru	mp = 2002	-	,						
			SAMPLE D	DATA					
Date: 12-12-17	Temp. Cond.	DO	pН	ORP	Turbidity	Other:	Color / Odor / Co	mments	
Time: 0846	°C mS/cm	mg/L	SU	mV	NTU	Other.	001017 00017 00	minonto	
Method: Stabilization	to.1 10.01	to.02	t 0.1	110	NIA				
			IELD PARAI						
Time Purge Vol.	Temp. Cond.	DO	pH	ORP	Turbidity	D77			
Time (gals) ML	°C mS/cm	mg/L	SU	mV	NTU	Other: DTW	Color / Odor / Co		
09:05 inital	10.32 0.181	7.27	6.96	248	87.3	73 17	Muckumost	Hy clear od	
09,10 1375	10.16 0.172	6.23	10.99	195	77.8	73.17	Murky, most	Ju	
2750	10.09 0.171	5.93	7.08	174		73.17	((11	
20 4125	10.01 0.171	5.65	6,99	176	63.5 55.7	73.17	11	1)	
09:25 5500	9970171	5.53	7.00	169	48.9	73 17	16	n	
09:30 6875	9,91 0.170		7.04	167	33.5	73 17	11	2)	
		Filedal		vocée		Sampli	iver.		
			1				7	200	
					[8]		· ·		
Sample information: metho	od, container number, siz	e, and type, pr	eservative us	sed.	والمال المال المال المال	Super Lake Sura Way	water a side of		
Anal	lysis	Prese	ervative		Container require	ements	No. of cont	tainers	
Method	537		400	125	ml unpes	, poly	2		
Method	537 TOP		4°C	125	ml unpe	s. pory	4		
			2000						
Observations/Notes:					1:	me IElov	v Rate (m	L/min)	
			2.6		2	THE THOU			
Pump Start Time: 08:	57	VOC Read	ing: $\mathcal{O}_{\mathcal{O}_{\mathcal{B}}}$	PM	୦୩	:06/27	v Rate (m	1	
Pump End Time	2:09:38		V	1		l l		1	
Pump Depth: 80 ft	tor								
Sample /Time: 09;	35								
Jampio / Inne	10	Duplicate II	D No.: M	4					
MS/MSD NA	4/5/				3				
ture(s):	~ 7/0	00							
	/ /								



cl	12M:	GROUNDWATER SAMPLING DATA SHEET			
Client:	NAVFAC	Project Number: 695610.05.FI.FS	Page:	1	of
ation:	NASWI Ault Field	Well ID: 6-5-11			
Lunt:	Area 6 Groundwater Sampling	Sample ID: WHAT- WI- A6-S-	-0718		

7/17/18 sunny, clear, ~70°F Weather: 142.19 FT.(BTOC)

Total Depth: Depth to water: FT.(BTOC) (-) 106.76 Water Column: 35.43 FT.

GAL/FT. (x) 0.653 Well Volume: GAL. 23.14

Total Purge Vol.:

-GAL. liters

Purge Device:

Date:

GeoTech PFC-Free Bladder Pump S/N: 1529

Well Dia.	Volume	Well Dia.	T
(inches)	(gallons/foot)	(inches)	Volume (gallons/foot)
1	0.041	6	1.469
1.25	0.064		
2	0.163		

Horiba U-53

Measuring Device: Solinst WLI

0.653

	7 7 7			PARAMET	ER STABILIZ	ZATION CRIT	TERIA		
		Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Par	rameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	
С	Critoria +0.1		±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1)	±0.1	±10	±10 % or ≤ 10 NTU	±0.5 (low flow)	
			[±0.02 (II > 1)		IELD PARA	METERS	1 2 10 10 10		
	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	DTW	
Time	(gals) ml	•	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Odor / Comments
1640	~1900	21-68	0.625	0.67	6.63	-85	15.5	106.8	clear, no odor
1645	~ 2400	20.53	0.640	0.49	6.51	-80	17.6	106.8	
1750	~2900	19,52	0.652	0.53	6.43	-77	21.7	106.8	
1755	~ 3400	18.65	0.650	0.39	6-39	-74	24.9	106.8	
1700	~3900	17.37	0.657	0.31	6.38	-75	28.5	106.8	
1705	~ 4400	17,41	0.656	0.23	6.39	-77	~ 31.3	106.8	brown Itan color
1710	~ 4900	16.83	0.668	0.22	6-41	-79	35-2	106.8	
1715	~5400	16.88	0.667	0.26	6.41	-82		106.8	turb. meter malfunction
1720	~5900	16.80	0.672	0.21	6.46	-83	39.5	106.8	
1725	~6400	16.46	0.673	0.16	6.49	-85	42.2	106-8	
1730	~6900	16.39	0.671	6.17	6.51	-85	44.8	106.8	
Sample info	ormation: metho	d, container	number, size,	and type, pres	servative use				
	Anal	ysis į		Prese	rvative		Container require	ments	No. of containers
PFAS			None		125-mL HDF	PE	2		
DEAD TOP	·			Mono		125 ml HDI)E		1

Sampling Team: G. Gardner, K. Remmen

PFAS TOP Assay None 125-mL HDPE HCI 40-mL VOA VOC

SVOC None 1-L Amber Glass

Observations/Notes: flow rate ~ 100 ml/min. Stopped pumping

Pump Start Time: 16:09

Initial Fill Time (sec): 13.75 Initial Discharge Time (sec): 36.7 Final Fill Time: 23

Final Discharge Time: 40

Air Monitoring: VOC (ppm)= ∅.∅

H2S (ppm) LEL (%)=

CO (ppm)= O2 (%)=

Pump Depth: 137.5 ft btoc

Sample Time: 1735

Duplicate ID: MS/MSD

nature(s):



		1 1 1 1 1 1 1 1 1 1		ODOUNDM	ATED CASE	1 1110 5					
Client: NAVEAC			GROUNDWATER SAMPLING DATA SHEET								
ation	Client: NAVFAC NASWI Ault Field				Project Number: 695610.05.FLFS Page: / of						
The state of the s	Area 6 Grow	Field ndwater Samplir	<u> </u>	Well ID: 6-5-12. Sample ID: WI-Apr. WI-Apr. 5-12-0119 Sampling Team: G. Goddon W. G. 5-12-0119							
Date.	1/23/201	a a a a a a a a a a a a a a a a a a a	19	Sam	pling Team	G. Gardner	K. Remmon E	0119			
Weather:			-50°F	Ouiii	ping roun.	o. Gardier,	K. Hemmon	. Hor Kerso.			
Total Depth	17										
Depth to w	otor. 7		FT.(BTOC)			Me	easuring Device:				
Water Colu	mu:		FT.(BTOC)					Horiba U-53			
	-		FT.			14/ 11/01					
Well Volum	ie: 7		GALIFT.			Well Dia.	Volume	Well Dia.	Volume (gallons/foot)		
Total Purge			GAL.			(inches)	(gallons/foot)	(inches)			
	-		GAL.			1 25	0.041	6	1.469		
Purge Devi	ce: (GeoTech PFC-F	roo Bladdor D	umn S/N+ 15	20	1.25	0.064 0.163	-			
	_	10-1	TEE DIAUGEI F	ump 3/14. 13/	29	4	0.163				
						4	0.033	J			
				PARAMET	FR STABILL	ZATION CRIT	FRIA				
_		Temp.	Cond.	DO	pH	ORP	Turbidity	DTW			
Par	ameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	1		
Cr	iteria	±0.1	±0.01 (if <1)	±0.05 (if <1)			±10 % or				
		20.1	±0.02 (if >1)		±0.1	±10	≤ 10 NTU	±0.5 (low flow)			
	D 1/1				IELD PARA	METERS					
Time	Purge Vol.		Cond.	DO	pН	ORP	Turbidity	DTW	0.1.101.10		
1020	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Odor / Comments		
1030	3.3	9,83	0.827	3.18	7.00	-127	349	111.60	0.03 9/m flow		
10 40	3.6	9.86	0.823	2.84	7.00	-130	253	111.61			
1050	4,0	9.89	8.820	3.21	7.00	-131	238	111.62			
1055	4.15	9,88	0.820	3.13	7.00	a132	13/	111.62			
1100	4.30	9.89	0.820		7,00	-13/	149	111.62			
1,05	4.5	9.89	0.818		7.00	-132	148	111.62			
1110	4.7	9.89	0.818	3,30	6.99	-13/	176	111.62			
11 15	4.9	9.90	0.818	3.34	6.99	-132	176	111.63			
			, ,	, , , , , , , , , , , , , , , , , , ,	<u> </u>	1362	178	111.63			
Sample info	rmation: me	thod, container	number, size,			d.		70	27.10		
	Α	nalysis			rvative		Container requirer	ments	No. of containers		
PFAS				None		125-mL HDF	E		8 200		
PFAS TOP	Assay			None		125-mL HDPE			1 (1)		
VOC				HCI		40-mL VOA			8-3-12		
SVOC				None		1-L Amber G	Blass		1728		
Observation	s/Notes:										
Pump Start	Time: ()8 3	54			Final Fill Ti	ma. 1C		Air Monitoring			
		me (sec): / 4	1. 25			nie. છ arge Time: પ	2	VOC (ppm)= 0	.0		
1	Initial Disch	arge Time (sec	1. 70		i iliai Discii	arge rime: 4	,	H2S (ppm)	001 110		
								LEL (%)=	all Clear		
								CO (ppm)=	***		
O2 (%)=											
Pump Depth: 140' 5 toc											
. 7:4	n: 12 nn										
Sample Tim	-100-5-	12-12119-MS	LMSD				Dunlicate ID: L	1) - Acre - C - 1= 1	1 6 13 2 6		
MS/MSDW	M	A darch	ner				Dapiloate ID. ()	11-200-5-121	2-0119 @ 1230		
c: mature(s)	·	V 600 61									

ch2m

8112111	GROUNDWATER SAMP	ING DATA S	SHEET		
WHENCE NAVEAC	Project Number:	605/01A	06. ET	F6	
Location: Oak Harbor, WA	Well ID:	6-5-1	HUSIFF	F)	
Event: Area & GW Sanglins	Sample ID:		06-6-5-	114 12 12	
Date: 12/8/17	Sampling Team:	D. D. T	ler/SEA	14-1211	
Weather: Clear, 40%, calm			TET / SEA	10	
		71 FIT	25 mmons	ROD	
Total Depth: 164, 70 FT.(BTOC)		Me	asuring Device:	Hariba	4-52 (102928
Depth to water: (-) 12 4.82 FT.(BTOC)			Date and Time:	U-18/17	
Water Column: 34.88 FT.				TEIDILI	((30
(x) 0,653 GALIFT.		Well Dia.	Volume	1	
Well Volume: 22, 78 GAL.		(inches)	(gallons/foot)		
Total Purge Vol.: ~ 2.5 GAL.	Fig. Transport	1	0.041		
		1.25	0.064		
Purge Device: Geotech PPC Free	Roller D.	2	0.163		
	provide Indo	1			
		•	0.653		
D. 201	SAMPLE C				
Date: (2/8/c7 Temp. Cond.	DO pH	ORP	Turbidity	Other	01 101 10
Time: (130 °C mS/am	mg/L SU	mV	NTU	Other:	Color / Odor / Comments
Methods Stabilization = 0.1 = 0.01	to. 2 = 0-1	=10	NA		
20001	THE RESIDENCE PROPERTY.	CHRONIC CONTRACTOR	10 11		
Time Purge Vol. Temp. Cond.	DO DH				
I THE		ORP	Turbidity	Other:	Color / Odor / Comments
	mg/L SU	mV	NTU	£+ 6+0°	Commence of the Commence of th
	15.85 7.83	41	: 121	129.81	clear, No odor
A STATE OF THE PARTY OF THE PAR	11.38 7.64	- 87	8.8	129.80	11 11 -
1500 1.50 0.928	10.08 7.68	-89	89	129.80	"
A 850 11.44 0 725	8.87 7.69	-88	8.6	129.80	11)1
12:38 3000 11.80 0.925	1.63 7.70	-89	8.4	129.80	11 11
12:75 3 750 11.89 0.924	732 7.67	-86	7.1	129.80	11 1)
12:48 4500 12,12 0.924	7.01 7.00	-85	5-7	129.80	4
12:53 5 250 12.17 0.924	682 7.64	-85	4.9	129,80	11 11
12:58 6000 11.81 0.919	6.79 7.68	-85	4.5	129,80	11 11
13:03 6750 11.62 0.921	6.60 7.69	-85	4.1	129.30	il 11
13.08 7500 11.66 0.924	6.44 7.69	-84	3.9	129.80	10
Sample information; method, container number, size,	and type, preservative use	AND DESCRIPTION OF THE PERSON			
Analysis	Preservative	C	container requirem	nents	No. of containers
Method 537	4°C	125 ml	unpres		2
Method 537 TOP	4°C	125 m	1 unpre	ſ	4
		1000			
212	ula era fran	1	0		
Observations/Notes Arr Tubing had rip Pump Start Time: 12:03	an air sine ai	nd Water	line. Ap	polied APE	tape, pressure
12:03 Tower 1	MOC Prodices A.O.	1 but	might re	at to cu	" line"
Pump Start Time: 12:03	Too heading. Ow pp	41	Time	Flows	ofe Continin
Pump End Time: 1317 Pump Depth: 156 At 6 toc			1212	D 150m	ate Continin)
Pump Depth: 150 + 6 to C			12.2	1	
Sample /Time: 13:10					

ch2m:

Crient:	GROUNDWATER SAMP	LING DATA S	SHEET			
Location: NAVFAC	Project Number:	64561	0,05,F]	C.FS		
Event. A Diarbor	Well ID:	6-5-17				
Date: Area & Gw Sampling	Sample ID:		06-6-5-	-17-1717	1-10	P
Wast 17/8/17	Sampling Team:	DiBut	DiButler			
Tital, 40 , calm			25immon	1		
Total Depth: 146,8 FT.(BTOC)				11 .1		
Depth to water: (1) FT (PTOC)		Me	asuring Device:		-52 (102928
Water Column:			Date and Time:	12/6/17	11:4	0
WALET CALIET		Well Dia.	16.6			
Well Volume: 12.67 GAI			Volume			
Total Purge Vol.: ~2,5 GAL.		(inches)	(gallons/foot)			
OAL.		4.05	0.041			
Purge Device: Geotech PFC-Fre-	Rladdon	1.25	0.064	B. B. B. K. C.		
	Bladder	2	0.163			
≠ 5882		4	0.653			
AND THE RESERVENCES OF THE PARTY OF THE PART	SAMPLE I	DATA	Control of the Contro			
Date: \2/4/17 Temp. Cond.	DO pH	ORP	Turbidity	THE STATE OF	The second second	
Time: 11:40 °C mS/cm	mg/L SU		Turbidity	Other: DTW	Color / Odor /	Comments
		mV 110	NTU			3311113112
Method: Stabilization ± 0.1 ± 0.01	-0.2 -0.1	±10	N/A	-0.3ft		
E DESTRUCION DE LA CONTRACTION DEL CONTRACTION DE LA CONTRACTION D	FIELD PARA	METERS		Was a supply	42.5	1,400
Time Purge Vol. Temp. Cond.	DO pH	ORP	Turbidity	on OTH	FULLVIOLE	
(galet mL °C mS/cm	mg/L SU	mV	NTU	Other DTW	Color / Odor /	Comments
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	20,37 7,75	237	9.6		Clear, m	oclar
0 0 100	14.21 7.30	171	10.6	121.40	a f	8
1500 13.20 0.935	12.24 7.38	129	9.7	127,40	18	1
13.12.13	10.87 7.48	108	7.2	127.40	ti	18
0.27 2000 13:14 0 13:3	9.57 7.50	99	5.0	127 40	ü	U
12.37 3750 13.11 0.986	8,917,52	95	1.3	127.40	14	19
12 42 4500 13 19 0 987	8.49 7.53	91	1.4	127.40	р	1/2
13.10.10.	8.07 7.54	88	1.8	127.40	D	¥
12.52 6000 13.20 0.986		88	1.0	127.40	16	12
12:57 6750 13.23 0.986	7,52 7.57	86	1.1	127.40	A	54
13:02 7-500 13, 25 0.986	7.52 7.57	92	0,9	127.40	11	*
Sample information: method, container number, size	, and type, preservative us			E. P. C.		
Analysis Method 537	Preservative	(Container requirer	ments	No. of car	ntainers
Method 537 TOP	400	125		25	2	
711100 33 1 101	400	125	in L unp	res	4	
		Date of the last	25 55			
Observations/Notes: All params stable and purjed >1hr Pump Start Time: 11:55 Pump Ford Time: 13:10	except DAC by	de ve els	1 ,			
and pursed sin	- Proceed to consi	m 0 1000	1 time	, Flow R	late	
Pump Start Time: [1:55	VOC Reading:	2000	12:15	150 mL/	min	
Pump and Tine: 13:10	. U.U	FF		130 1112/	mik.	
Pump Depth: 136ft 6toc			19 630 2			
17'01			Hole Brush	The April 19 St. St.		
Sample Time: 13:05	3252 - 10 (665) - 13					
MS/MSD NA	Duplicate ID No.: NA	-	10 TO 15 TO 10	THE RESERVE OF THE PARTY OF THE		
ture(s): Sure Bille		THE REAL PROPERTY.				A CONTRACTOR OF THE PARTY OF TH
1 200 30		100000				

NAVFAC NAVFAC NAVFAC NAVFAC Container Summer Container Container Summer Container	CN:	2 M	, su		the model with the second of the second					
Location: Oak Harbor Ware Location: Oak Harbor Ware Sevent: Read to Gav Sampling Team: Sampling Team: Sampling Team: Sampling Team: Sampling Team: Sampling Team: Shannon F15. Marker SEA Weather Callon F14 F1.6F0.0 Depth to water: Water Column: 15 - 13 GAL. Purge Device: Geolech PFC- Free Bladder 2 0.163 Purge Device: Geolech PFC- Free Bladder 2 0.163 Date: 12-11-17 Temp. Cond. DO pH 0RP Turbidity Other: Color / Odor / Comments Time: 11:00 'C mS/cm mg/L SU mV NTU PER STANDOR COLOR OF SEA NO. Of Container Fourier Flag Sea No. Of Container Flag Sea No. Of Containers Flag Sea No.	The same of the	and the grantest	Sall a	G	ROUNDWA Projec	TER SAMPL ct Number: _	6956	10.03.	I.FS	/ 5
Sample Date: 12-11-17				A		Well ID:	feet - m	UI	The same of the sa	7/WT-AD6-6-2
Date: 12-11-17 Weather Calm Reshal Sun. Low: 30°F Total Depth: 16 7 14 FT (RTO) Depth to water: 0 144.05 FT (BTO) Water Column: 23 7 FT (BTO) Water Column: 15 78 GAL. Total Purge Vol: ~1 GAL. Purge Device: Ge-bech PFC-Free Bladder 2 0.663 Pump # 5882 Date: 12-11-17 Temp. Cond. Depth on PH ORP Turbidity Office: Color / Odor / Comments Methods S13x31x31x31x31x31x31x31x31x31x31x31x31x3	Location:			- North		-	W/T -	A010-6-3	J / N X	+/12
Date: 12-11-17 Temp. Cond. Do. pH ORP Turbidity Other: Color/Odor/Comments II: 20 Interest II:	Event: A	irea lo,	GW San	ubling			01	LITT C.M	MOIT I	00
Deptr to water: 1	Date: 1	2-11-17				ning ream	Sharing	Ditter/	SEA	DINE .
Deptr to water: 1	Weather: C	21m Parti	al Sun. 1	-ow:30	F	-	David	Bullet	11 21	500 TO-274
Deptr to water: 1			1	H199:47	°F		Mo	asuring Device:	Horiba U	300 10
Deptr to water: 1	Total Depth:	16					IVIC	Date and Time:	12-11-17	11:00
Well Volume: 15, 48 GAL.	Depth to wa	ter: (-) 1	44.03 F	T.(BTOC)				Date and Time.	16.11	
Well Volume: 15, 48 GAL. G			3 7 F	T.		_			l	
Well Volume: Total Purge Vol.:	Water Colum	(v)					Well Dia.	12 10000000		
Total Purge Vol. Purge Police: Gestech	Mall Malum					i	(inches)	(gallons/foot)		
Purge Device:						ŀ		0.041		
Purge Device: Geotech PFC- Free Bladder 2 0.163 Pump #5882 2 0.163 4 0.653	Total Purge	Vol.:				ŀ				
Date: 12- -17 Temp. Cond. DO pH ORP Turbidity Other: Color / Odor / Comments Method: Stabilization Color Comments Other: Color / Odor / Comments Other: Other: DTW Color / Odor / Comments Other: DTW Color / Odor / Comments Other: DTW Color / Odor / Comments Other: DTW Other: DTW Color / Odor / Comments Other: DTW Other: D				-c	nı-	14				
Date: 12- - 7 Temp. Cond. DO pH ORP Turbidity Other: Color / Odor / Comments Method: Stabilization Color Co	Purge Device	ce: Ga	extech	Ptc-tr	ee blac	goer				
Date: 12- -17 Temp. Cond. DO pH ORP NTU Other: Color / Odor / Comments Method: Stabilization Color / Odor / Comments Other: Other: Color / Odor / Comments Other:	•		mo #	5887		1	4	0.653		
Date: 12- - 7 Temp. Cond. DO pH ORP MTU MTU Color / Comments Mothod: Stabalization + O. + O. + O. O. + O. O. + O. O.				· · · · · · · · · · · · · · · · · · ·			ΛΤΛ			AND THE COURT SUSSEE SHEET
Date: 12-17-17-17-18-11-10 Properties				- 6 1 1	- DO T			Turbidity		a L / Ode - / Comments
Method: Stabilization Container No. of containers				0.00					Other:	Color / Odor / Confinents
Time Purge	Time: 11:	20	°C	mS/cm	mg/L	SU				
Time Purge	Mark ad 6R	9	+01	+001	+0 05	401	± 10	N/A		
Time Purge Vol. Temp. Cond. DO pH ORP Turbidity Qther. DTW Color / Comments Color Color Comments Color Color Comments Color	Wetnou:	CH2 balizati	m - 0.1				•			
Time (galifield "C ms/cm mg/L SU mV NTU different blood of continued of container in the little blood of container in the little blo		Š						T - 1 11		
11 130		Purge Vol.	Temp.	Cond.	DO	pН	ORP		Other: DTW	Color / Odor / Comments
1:30 inital 8.95 0.796 6.09 7.31 88 5.0 177.03 1.0	Time	(nals in La	°C	mS/cm	mg/L	SU	mV		Jt btoc	
135 150 10.41 0.792 0.00 7.33 55 2.9 144.03 1 1 150 10.82 0.792 0.00 7.26 48 3.3 144.03 1 1 1 1 1 1 1 1 1	11.20		8 95				88		144.03	
Sample information: method container number, size, and type, preservative used. Sample information: method container number, size, and type, preservative used. Analysis Preservative Preservative Container requirements Method 537 A°C 125 mL unipres. poly Method 537 TOP 4°C 125 mL unipres. poly 4°C 125 mL unipres. poly The first Time: 11:08 Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft bloc Sample Time: 11:55 All parameters stable except tempoerature, which is increasing, theriba is in Sunlight Collected Sample Jhyways.				0 192				2.9	144.03	(1))
Sample informations/method, container number, size, and type, preservative used. Sample informations/method, container number, size, and type, preservative used. Analysis Preservative Container requirements No. of containers No. of con							AS			11))
Sample information method container number, size and type, preservative used. Analysis Method 537 M			10,82							" »
Sample information method, container number, size and type, preservative used. Analysis Method 537	4\$		11.1+							
Analysis Method 537 Method 5	11:50	3000	11.32	0.789	0.00	7.57	40	<u> </u>	177.03	
Analysis Method 537 Method 5										
Analysis Method 537 Method 5										
Analysis Preservative Container requirements No. of containers Method 537 4°C 125 mL unpres. poly 2 Method 537 TOP 4°C 125 mL unpres. poly 4 Observations/Notes: Tybing Kept breaking, might need to heat up in the future so it's less brittle Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft bloc All parameters Stable except temperature, which is increasing. Horiba is in sunlight Collected Sample Sample /Time: 11:55										
Analysis Preservative Container requirements No. of containers Method 537 4°C 125 mL unpres. poly 2 Method 537 TOP 4°C 125 mL unpres. poly 4 Observations/Notes: Tybing Kept breaking, might need to heat up in the future so it's less brittle Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft bloc All parameters Stable except temperature, which is increasing. Horiba is in sunlight Collected Sample Sample /Time: 11:55										
Analysis Method 537 Method 5										
Analysis Method 537 Method 5										
Analysis Method 537 Method 5		Law worth	od container	number size	and type or	eservative us	ed.			
Method 537 TOP 4°C 125 mL unpres. poly 2 Method 537 TOP 4°C 125 mL unpres. poly 4 Observations/Notes: Tubing Kept breaking, might need to heat up in the Liture so it's less brittle Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft bloc All parameters stable except temperature, which is increasing. thriba is in Sunlight Collected Sample Sample /Time: 11:55	Sample Ini	Officiation, men	olycic	number, etce	Prese	ervative		Container requirer	nents	No of containers
Observations/Notes: Tubing Kept breaking, might need to heat up in the Liture so it's less brittle Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft bloc Sample /Time: 11:55 Need to heat up in the Liture so it's less brittle time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Saruple 2 on yways.		Alle	alysis				125	ml albores	0014	
Observations/Notes: Tubing Kept breaking, might need to heat up in the Liture so it's less brittle Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft bloc All parameters stable except temperature, which is increasing. Horiba is in sunlight Collected Sample Jnyways.	1	Method	22 1	<u> </u>	1	80	120	mal alterias		\
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.		Method 537 10P				<u> </u>	123	ML unpres	. poly	<u> </u>
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.										
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.										
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.										
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature, which is increasing. Horiba is in Sunlight Collected Sample Jnyways.										
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.									*******************************	
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.	01	-na/Notas: T	whina K	ent Los	المراط	aht need	to hear	t unia the	Tihin S	14's 9.55 1 3W
Pump Start Time: 11:08 Pump End Time: 12:07 Pump Depth: 156 ft 600 Sample /Time: 11:55 VOC Reading: 0.0 ppm time Flow Rate 11:33 150 mL/min All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.	Observati	UIIS/INUICS.		cho occ	A . w.	7.	,,,,,,	p J.	1) 1 4	TO YEST PHATE
Pump End Time: 12:07 Pump End Time: 12:07 Pump Depth: 156 ft 600 All parameters stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jnyways.			_					,	time Flo	w Kate
Pump Depth: 136 + 16 to All parameters Stable except temperature which is increasing. Horiba is in Sunlight Collected Sample Jhympys.	Pump St	art time:	12:07	-	VUC Readi	ing. OLD	IL.			
Pump Depth: 156 + 16 600 All parameters Stable except temperature which is increasing thriba is in Sunlight Collected Sample shyways.	Pump	End lime	110			×	- 1 - 1 -	. 11	133 120	J ML/MIN
Sample Time: 11:55 is increasing thoribs is in sunlight Collected Sample Jayrusys.	Pump De	epth: 156 -	tt PIOC		All po	orameter.	s stab	le except	temper	sture which I
	1	is increasing thombs is in sunlight collected Sanutal								
	Sample /	Sample Time: 11:55 Jhywbys.								
IMA/MOD 1-14 / Dublicate in No. 1 1 100 0 3 1 1 121+	MS/MSD		U	1	Duplicate II) No.: W	L A06-	-6-5-19P	-1217	

GROUNDWATER SAMPLING DATA SHEET

Client: **NAVFAC** Project Number: 695610.05 FI. FS Location: NASWI Area 6 Well ID: 6-5-24 Event: off-base GW sampling Sample ID: WI - A06 - S-24 - 0818 Date: 8/30/18

Sampling Team: Krystle Remmen Weather: overcast, ~65°F calm

Shannon Fitzsimmons Total Depth: Measuring Device: 2001 Water level meter, unknown FT. (BTOC) - based on orig. construction

119.3 0 Depth to water: ()111.46 Water Column:

FT.(BTOC) 7.84 FT.

(x) 0.653 GAL/FT. Well Volume: GAL.

5.119 Total Purge Vol.: (20.162 L) 5.326 GAL.

Purge Device:

Geotech PFC-free bladder pump

Well Dia.	Volume
(inches)	(gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

Date and Time: 8 30118

			*	CAMPIE	DATA			
30 18	Temp.	Cond	I no			Turbidity	T	
°C mS/cm mg/l SH m\/ N			Other:	Color / Odor / Commen				
toribu u-52		morcin	I Hg/L	30	INV	1410	 	
				LEI D DADAI	METEDS		1	
Purge Vol.	Temp.	Cond				Turbidity	T	
(gals) mL	°C				100.00	10.000000000000000000000000000000000000	Other: DTW	Color / Odor / Commen
~ 2837.0	5 18.43		7.5					tan/brown, no odos
3992	15.67							chinati tou
4322						13.3		slightly tan
	14.65				X2			clear
	14.31							Catt
	14.19	0.619	6.52					
	14.17	0.618	6.30			7	1) (/	
	14-13	0.617	6.59	7.63	151		11 11	
7292	14.11	0.617	6-66	7.65	152		11 11	
							1.75	
rmation: metho	d. container	number size	and type nre	servative use	4			
Analy	vsis	Turrisor, GIZO,				Container manile		
		med						No. of containers -
								2'
SIM - 1,49-	-dioxane							3
					1-1	Amber gr	085	2
- A) - I					18.			
IS/INOTES;						e ^o		
Time: 11 - 20	a	,	VOC Reading	n. v v				
11116. 1(.Z	· r		TOO INEAUIII	9. 0.0	ppm			
	(gale) mL ~ 2833.0 3992 4322 4817 5312 5807 6302 6797 7292 ormation: metho Analysis of 14) SIM - VINY SIM - LIV	Purge Vol. Temp. (gals) mL °C ~ 283.05 18.43 3992 15.67 4322 14.73 4817 14.65 5312 14.31 5807 14.19 6302 14.17 6797 14.13 7292 14.11 Dirmation: method, container in Analysis List of 14) - EPA 537 SIM - vind chleric SIM - Liu-dioxane	Purge Vol. Temp. Cond. (gale) mL °C mS/cm "C mS/cm "S/cm "C mS/cm "S/cm "C mS/cm "S/cm "S/cm	**C mS/cm mg/L **Horibu u-sz Purge Vol. Temp. Cond. DO (gels) mL °C mS/cm mg/L **C mS/cm pd/ **MS/cm pd/ **MS/cm mg/L **C mS/cm mg/L **C mS/cm pd/ **MS/cm pd/ *	Temp. Cond. DO pH SU	**C mS/cm mg/L SU mV **Honby u-sz Purge Vol. Temp. Cond. DO pH ORP	Temp. Cond. DO pH ORP Turbidity NTU	Temp. Cond. mg/L SU mV NTU Other:

Pump Depth: 117.0 ft btoc

stop ~ 1338

Sample /Time: WI-A06-5-24-0818 12:25

MS/MSD W1-A06-5-24-0818-MS MSD Duplicate ID No.: W1-A06-5-249-0818

Signature(s):

initial flow rate: 250 mL/89 sec = 2.8 mL/sec = 168.5 mL/min or ~170 mL/min 240 mL/87 sec = 2.75 " " = 165.5 mL/min or ~165 mL/min

each

			GROUNDW	ATER SAMP	LING DATA	SHEET			
Location: (NAVFAC		Pro	ect Number:		010.05.4	=I.FS		
Event: Z	Jak Harbor.	WA		Well ID:			6 5/ 1	217/7	00
Date:	2-07-17	5 amplix	San	npling Team:		A06-6-		217/-1	<u> </u>
Weather:	lear, 30 F, C	alm		.pg	Shan		simmons	RDD	
Total Depth:	76.82	FT.(BTOC)				easuring Device:			-11970
Depth to wat	er: (-) 3 A . L 1 4	FT.(BTOC)				Date and Time:	12/07/		.00
Water Colum	in: 38.38	FT.					12/01/	17 13	-00
Well Volume	MQ.653				Well Dia.	Volume			
Total Purge \		GAL.			(inches)	(gallons/foot) 0.041			
and and					1.25	0.064			
Purge Device	: Geoted	PFC-	- Free B	Isdder	2	0.163			
					4	0.653			
D1000000000000000000000000000000000000				SAMPLE	DATA				
Date: 12-	07-17 Temp.	Cond.	DO	pH	ORP	Turbidity	0.11		
Time: 13:0	02 °C	mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor	/ Comments
Method: St	1. O + notesileden	10.01	+0.2	+01	= 10	N/A			
	121.04			FIELD PARA			5 30 50 50 50	SEASON	591691000
Time	Purge Volce Temp.	Cond.	DO	pH	ORP	Turbidity	Othor: OTH	Color / Odor	/ Comments
13:00	tgals mL °C	mS/cm	mg/L	SU	mV	NTU	Other: DTW		
13:07	inital 29.54	0.819	18.37	8.01	-108	29.0	38.46	Clear;	slightly n
4	2004000 10,30	0.831	10.49	8.30	-150	23.0	38.46	11	11
	1800 pa 10-28	0.831	9.39	8-32	-154	15.8	38-50	Clear,	hooder
	3000 lo.30	0.831	8.74	8,34	-155	15.6	38,50	11	11
13:37 1	12000 10.31	0.832	8.54	8.34	-155	14.9	38.50	11	11
	14000 10.35	0.832	8,46	8.35	-157	11.9	38,50	11	(1
	All params	34961	e, pro	Marie Waller on	THE RESERVE AND ADDRESS OF THE PERSON NAMED IN	6	30130	- ' (
			/ 1						
Sample inform	nation: method, container	number size	and type nre	servative use	h				
Sample inform	Analysis	Hulliber, Size,		rvative		Container requirem	nents	No. of co	ntainers
Meth	od 537		49		125			2	
Metho	d 537 TOP		49		125	mL unpn		4	
						UE OF THE PARTY OF	1 0		
					100		25 YEAR		
	Alakaa	10			The William				
Observations							I FI	OW RO	10
Pump Start T	rime: 12:56 not time: 1343 : 71 ft bloc		VOC Readin	g: 0.0p	om		time F1 3:03 400	011 112	
Pump E	nd Time: 1343			, , , ,		1	3:03/400	mL/mi	m
Pump Depth	: 71+16100						42.00		
Sample /Tim	e: 1340								
MS/MSD	NA .		Duplicate ID	No.: NA					
sture(s):	David D -	1						The state of the s	

	Reservation and the	SM		GPOLINDW	ATED CAMD	I INC DATA	CHEET				
Client:	NAVFAC			GROUNDWATER SAMPLING DATA SHEET Project Number: 695610.04.FI.FS Page: of							
AND DESCRIPTION OF THE PROPERTY OF THE PROPERT	Ault Field			Project Number: 695610.04 FI.FS							
Event:	February 2018	Groundwater	r Sampling	Sample ID: WI-AF- 69 WI-A 06 -6-5-27-0218							
Date:	2/2//18		Camping	Sampling Team: D. Batler, L. Baumann, S. Fitzsimmong							
Weather:		30'7, cal	m	·	ping ream.	O DALLE	r) Li Daum	ann, 5, +11	25 mmc	707	
	//	- XK	K	•	= = = .5			Α			
Total Dept		34,30	FT.(BTOC)			Me	easuring Device:	Horiha U	1-53 Lo	t#:1+25°	
Depth to w		121,13	F1.(B100)					Solinst M	odel 10	2 Lot #:	
Water Colu	ımn: <u>l</u>	2.55	FT.					_	3	A0021	
	<u>(x)</u>		GAL/FT.			Well Dia.	Volume				
Well Volun		18.20	GAL.			(inches)	(gallons/foot)				
Total Purg	e Vol.:	250	GAL- DA			1	0.041				
			mL	1 . 1 1 1	11 0	1.25	0.064				
Purge Dev		ocontro		Lot# 4	164	2	0.163	1			
	RI	adder F	F gmy	\$6109		4	0.653	1			
				DADAMET							
		Tomp	Cond		ER STABILIZ			DTW			
Des		Temp.	Cond.	DO	рН	ORP	Turbidity	DTW			
Par	ameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC			
Cı	riteria	±0.1		±0.05 (if <1)	±0.1	±10	±10 %	±0.3 (low flow)	1		
7.7			±0.02 (if >1)		IEI D DADA	AFTERO	≤ 10 NTU		of the control to the control of the		
	Purge Vol.	Tomp	Cond		IELD PARA	And the Control of th	Touler dies	DTW			
Time	in (gals)	Temp.	Cond.	DO	рН	ORP	Turbidity	DTW	Color / Od	or / Comments	
10:24	inita	8.51	mS/cm	mg/L	SU	mV	NTU	ft BTOC	100	Market Control	
	1,250	9,38	N/A	N/A	6.84	218	N/A	121,77	Clear.	Noodor	
10:34	1,875	7.49	0.367	21.80	7.26	199	0.17	121,75	LL		
10:44	2,500	9.55	0.395	6.71	7.37		0.13	121.75		. 1)	
10:49	3.125	9.55	0.395	6.65	7.56	1860	0.06		(())	
10:54	3,750	9.60	0,395	, ,	7.79	178		121.75	u	71	
10:59	4,375	9.59	0.395	6.71	7.77	170	0.12	121,75	(1))	
11:04	5,000	0 11	0.396	6.36	7.68		0,20	121.75	u	"	
11:09	5,625	9.59	0.396	6.47	7.77	175	0.00	121.75	u	"	
11:14	6,250	9.59	0,396	6.46	7.74	168	0.05	121.75	(1	71	
AII	parame			Proceed	with	Samp		121013			
,,,,	taranic	0	DIC. V	30 CLEC	641111	SIM	7				
Sample info	ormation: metho	od. container	number, size.	and type, pre	servative use	d				STATE OF THE STATE OF	
			70 SIM		rvative Unp		Container requirer	ments	No of	containers 2	
PFI	45 537				5.4°C		5 mL Poly		2		
	8260 SI	M		HC	1		-		3		
Observation	ns/Notes:- Ha	d dedical	ted tulai	ag note	Flow L'a	14.91		Air Monitoring:	HS	B7	
		24 : Horit	os died v	while reac	lina paran	neters Ch	isnojed	VOC (ppm)=	0.0	O. O	
	ba H	eries.		191110	and barran		J	H2S (ppm)	0	0	
		1						LEL (%)=	0	0	
	t Time: 10							CO (nnm)=	0	2019	
	Initial Fill Tim		13		Final Fill Tin		-	02 (%)=	0,9	2017	
	Initial Dischar				Final Discha	ırge Time: 🧟	35				
		sure-7	5 psi ~								
Pump End	Pump End Time: (134) Purge Rate: 25 mL/min_										
Pump Dep	th: 131	ft bt	COC				-// 1 3				
Sample /Ti	me: [:]	_									
MS/MSD	N/A	N	1				Duplicate ID: N	I/A	-		
Signature(s	-	W/A)	Tom	~~~			Duplicate ID. N	4/17			
	100	1//	4 0								

	SM		GROUNDW	ATER SAMP	LING DATA	SHEET	4		Na A	
Client: NAVFAC			SAME TO SERVICE AND ADDRESS OF STREET,	Project Number: 695610.04_FI.FS Page: of						
Location: Ault Field			Well ID: -WI-AF-00 6-5-28							
	18 Groundwater	r Sampling	Sample ID: WI-AF-69 WI-A06-6-5-28-0218							
Date: 2/21/6		Camping	Sam	Sampling Team: D. Butler, L. Bay mann,						
	V. 3017 ca	la		Si Fitzsimmons						
-	71						11 1 1	1 63		
Total Depth:	157.10	FT.(BTOC)			Me	easuring Device:		1-53		
Depth to water:	(-)121.60	FT.(BTOC)					Pine 1 2	1369		
Water Column:	35.42	FT.			Wall Dia	Valuma				
W-UV-L	(x) 0.653	GAL/FT.			Well Dia.	Volume				
Well Volume:	23, 13	GAL.	4000		(inches)	(gallons/foot) 0.041				
Total Purge Vol.:	2.8	-GAL-ED	-110.		1.25	0.041				
Durge Devices	Geotech	PFC-Fr	12.0		2	0.163				
Purge Device:	Bladder	pump #	6131		4	0.653				
	Dlagaer	pamp to	@13	• /		0.000				
			PARAMET	ER STABILIZ	ZATION CRIT	TERIA				
	Temp.	Cond.	DO	pН	ORP	Turbidity	DTW			
Parameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC			
Criteria	±0.1	±0.01 (if <1)	±0.05 (if <1)	±0.1	±10	±10 %	±0.3 (low flow)	1	70.	
Criteria	±0.1	±0.02 (if >1)			, revinese	≤ 10 NTU	±0.5 (low flow)	2		
			The second secon	FIELD PARA	STATE OF THE PARTY					
Time Purge Vo		Cond.	DO	pН	ORP	Turbidity	DTW	Color / Odor / Co	omments	
L (gais)	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC		-	
1044 initial	8.64	0.582	2,59	5.86	-35	151	121,68		elet, ne ale	
1648 400	9.21	0,589	1.86	6.33	-99	1311	121.68	" (1)		
1052,800	0,60	0,596	1,64	6,45	-117	12.8	121,60	1,		
1056 1.2	9.54	0.597	1.4	6.49	-123	11.9	12,70	11		
101100 1.6	9.59	0,598	1,22	6.61	-134	11.4	121.70			
1104 2.0	9.77	0.601	1.13	6.67	-142	11.4	121,70	2) 1)		
1112 2.8	9.85	0.602	1.04	6,69	-144	11.4	121.70	**		
1110 00	9.89	0.602	1,07	6110	-146	12.3	121,10			
									-1112	
Sample information: m		number, size,			ed.					
	Analysis	- 4		rvative		Container requirer		No. of conta	ainers	
	00 STM/8			400			ynbort!	3/2		
M	of God 53)	40		12	Snil Po	14	2		
Observations/Notes:	No dedica	ited tubi	ng in w	ell,			Air Monitoring:		BZ	
			J				VOC (ppm)=		0.0	
						H2S (ppm) LEL (%)=	O	0		
Pump Start Time: 10				CO (ppm)=	20.9 2	0000				
Initial Fill		Final Fill Ti	ma: 20	O2 (%)=	20.9 2	0.9				
Initial Disc			arge Time:	60	02 (70)-	-0. (,			
		, 555). & C		· mai bioon	argo rimo.	40				
Pump End Time:		Purge Rate: 100 mL/min								
			(00 %	-(1.1.1						
Pump Depth: 150	the place									
Sample /Time: (()	2									
)					Dunlingts ID:	A.C.A	-		
MS/MSD NA	N 80 11		L			Duplicate ID:	NA			

				200		
	GROUNDWATER SAMPI	ING DATA	SHEET			
Cirent: NAVFAC	Project Number:	6951	010.05.F	I.FS		
Location: Uak Harbor, WA	Well ID:	(n - S -	31			
Event: Ares 6, GW Sampling	Sample ID:	WI-A	406-6-5	-31-1217		
Date: 12-11-17	Sampling Team:	Shanno	in Fitzsim	mons/RD	D	
Weather: Calm Sunny Low: 30°F		David	Butler / S easuring Device: Date and Time:	EA	PI	NE - AA
J. High: 490	F	Ma	aguring Dovice:	Hariba 2	1-500 ID	- 2744
Total Depth: 122. 9(6 PT.(BTOC)		IME	Date and Time:	12-11-17	12:55	
Depth to water: (-) 108,78 FT.(BTOC) Water Column: 14,18 FT.			Date and Time.	12-11 1.	12	
		Well Dia.	Volume	1		
		(inches)	(gallons/foot)	-		
Well Volume: 9.26 GAL. Total Purge Vol.: ~3 GAL.		1	0.041			
		1.25	0.064			
Purge Device: Geotech PFC-fr	ee Bladder Pump	2	0.163			
#5882	•	4	0.653			
# 2882	J					
	SAMPLE I	DATA		200	7 7 7 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	e care
Date: 12-11-17 Temp. Cond.	DO pH	ORP	Turbidity	Other:	Color / Odor /	Comments
Time:\2:55 °C mS/cm	mg/L SU	mV	NTU	Otrici.	001017 00017	
Method: Stabilization + O. 1 + O. 01	18:030 - 0.1	± 10	N/A	_		_
	FIELD PARA	METERS				
Time Purge Vol. Temp. Cond.	DO pH	ORP	Turbidity	Other: DTW	Color / Odor /	Comments
Time (gals) Mus °C mS/cm	mg/L SU	mV	NTU	Other: DTW		
13:18 inital 10.75 0,492	6.33 7.95	156	7.9	108.81	Clear. N	
13:72 875 10 48 0.495	3,40 7.85	155	8.2	108.80	и	n
128 1750 10.15 0.499	3,10 7,91	157	7.9	108.80	66	n
2,625 [0,11 0,50]	2.62 7.89	161	7.6	108.80	11	•
13:38 3500 10.07 0.500	2.50 7.90	162	8.0	108,80	u	3)
13:43 4375 9.93 0.501	2.25 7.87	169	6.9	108.80	61	
13148 5250 987 0.503	1.49 7.91	167	ها في	108.80	ti (i	3)
13.53 6125 979 0.502	2.29 7.88	169	5,9	108.80	61	15
13:58 7000 9.77 0.503	2.01 7.82	170	3,2	108.80	11	1,
14:03 7875 9.73 0.504	2,35 7,87	179	3.7	108.80	u	11
Sample information; method, container number, size			1 311	100,00		
Analysis	Preservative		Container requirer	ments	No. of con	tainers
Method 537	4°C		L unpres.	poly	2	
Method S37 TOP	4°C		L unpres.		4	
FICTHOO SST.				1 3		
					ļ	
Observations/Notes: Purged for > 1 hr,	proceed to far	NDIE.			Note (
Observations/Notes. Purged to: 71 (4)			₹	ine Flow	Rate Cm	1L/min
Pump Start Time: 13:05	VOC Reading: O.Op	0.00	13	20 175)	
Pump End Time: 1415	Υ.	7111		1		1
Pump Depth: 118 Ft b toc						
14:10						
Sample /Time:	T					
MS/MSD NA	Duplicate ID No.: N/A	4				
ture(s):	<u></u>					



Sample Time:
MS/MSD
Simpature(s):

Ch2/10:	CPOLINDWATER SAMPLING D
	GROUNDWATER SAMPLING D

U		SM SM		ODOLINDW	ATED CAMD	LING DATA S	PUEET				
Oliant	NIAN/EAC					695610.05.F		Page: \	of 2		
	NAVFAC NASWI Auli	Field		. Pioj				raye. (01 2		
		ındwater Sampli	ng	Well ID: 6-5-40 Sample ID: ₩I-AF- WI-A66-6-5-40-07/8							
Lant: Date:			rig	Sam		G. Gardner,		0 01/8			
	7/18/18 Overcast,			·	ipining realin.	O. Oardrici, i	IX. IXOIIIIIOII				
Weather.	OVEY COST ,			•							
Total Dept		138.8	FT.(BTOC)			Me	easuring Device:				
Depth to w		(-) 90.93	FT.(BTOC)					Horiba U-53			
Water Colu		47.87	FT.			W 11 B:		Well Dia.			
		(x) 0.163	GAL/FT.	00 61		Well Dia.	Volume		Volume (gallons/foot)		
			29.52		(inches)	(gallons/foot)	(inches)	1.469			
Total Purg	e vol.:	4.35	GAL. of	16.5 L		1.25	0.041 0.064	6	1.403		
Dunna Dav		CooTook DEC I	roo Bladdar [Dump C/N: 15	20	2	0.064				
Purge Dev	ice:	GeoTech PFC-F	riee blauder i	-unip 3/14. 13/	29	4	0.653				
					•	4	0.033]			
	PARAMETER STABILIZATION CRITERIA										
	****	Temp.	Cond.	DO	рН	ORP	Turbidity	DTW			
Par	ameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC			
				±0.05 (if <1)			±10 % or	LO E (love flow)			
Cı	riteria	±0.1		±0.2 (if >1)	±0.1	±10	≤ 10 NTU	±0.5 (low flow)			
			1=0.0= \/		IELD PARA	METERS					
	Purge Vo	I. Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	Color / Odor / Comments		
Time	mL (gals)	l °c ⊓	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Odor / Comments		
0855	21250	17.95	4.50	9.61	4.01	327	0.00	986	doudy/gray, no odor		
0900	~1890	15.91	0.197	0.97	7.89	94	455	98.5	turb meter flashing		
0905	2530	15.96	0.199	1.11	7,95	89	387	98.45	very cloudy		
0910	3170	15.83	0.199	0.84	7.98	85	321	98.49	· · · · · · · · · · · · · · · · · · ·		
0915	3810	15.64	0.200	0.91	7.99	82	271	98.5			
0920	4450	15.82	0.199	0.81	8.04	78	230	98.5			
0925	5090	15.77	0.199	0.75	8.03	77	199	98.5			
0930	5730	15.79	0.200	0.86	8.05	74	173	98.5			
0935	6370	15.62	0.203	0.78	8,13	67	158	98.5			
0940	7010	16.08	0.202	0.72	8.03	69	120	98.5			
0945	7650	16.69 ethod, container		0.67			120	70.3			
Sample into		Analysis	Humber, Size,		rvative		Container requirer	ments	No. of containers		
PFAS		Arialysis		None	IVauve	125-mL HDF		HOHO	2		
PFAS TOP	Δεεαν			None		125-mL HDF			4		
VOC	Лозау		· · · · · · · · · · · · · · · · · · ·	HCI		40-mL VOA	_		3		
svoc				None		1-L Amber C	Blass		2		
Observatio	ns/Notes:	~128 mL/min	a flow rat		per 5 m						
Pump Start Time: US30 Initial Fill Time (sec): 13 Initial Discharge Time (sec): 35				,	Final Fill Time: 13 Final Discharge Time: 35				Air Monitoring: VOC (ppm)= ⊘. ⊘⊘ H2S (ppm) LEL (%)=		
Pump Dep	oth: 30°	BTOC						CO (ppm)= O2 (%)=			

Duplicate ID:



C	12/10:	
		G

Client: NAVFAC			SM									
Masuring Device: Sample Different										. 2		
Area 6 Groundwater Sampling 7					- Proj				Page: 2	or Z		
Date: 1/18 1 18 18 18 18 18 1					-							
Weather: Sourist Partity Cloudy Total Depth: 136-96 FT.(BTOC) Horba U-S3			water Sampli	ng	-	Sample ID: WI-Ar- WI-A06-6-5-40-0718						
Total Depth to water:		7/18/18			₋ Sam	ipiing ream:	G. Gardner,	K. Remmen				
Depth to water: 1	weatner:	sunny I part	lly cloudy,	~ 65°F	-							
Depth to water: Depth to w	Total Dept	th: \	38.8	FT.(BTOC)			Me	easuring Device:	Solinst WLI			
Well Volume: 7.8 GAL or 29 - 5 L GAL or 16 - 5 L or or or or or or or			90.93	FT.(BTOC)		Horiba U-53						
Well Volume: 7.3 GAL. or 24.5	Water Colu	umn:	47.87									
Validouries 1.35 Validouries 1.46 Validouries			0.163	GAL/FT.	1		ı	I .	1	Volume (gallons/foot)		
Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529 2 0.163 4 0.853										,,,		
Purge Device: GeoTech PFC-Free Bladder Pump S/N: 1529 2	Total Purg	je Vol.: 4 <u>, 35</u>	155	GAL. or	16.5L			1	6	1.469		
Parameter			T		0/51 45	00			-			
Parameter Temp. Cond. mS/cm mg/L SU mV NTU ft BTOC	Purge Dev	rice: Ge	o rech PFC-F	ree Bladder I	oump S/N: 15	29 -			1			
Parameter						•	4	0.000	J			
Parameter					PARAMET	ER STARILI	ZATION CRIT	TERIA				
Parameter		W In the second	Temp	Cond					DTW			
Criteria	Par	rameter			1			,				
Criteria												
Time	C	riteria	±0.1	, ,	1 ' '	±0.1	±10		±0.5 (low flow)			
Time	77 - 77			1=0.0= ()		FIELD PARA	METERS					
Time		Purge Vol.	Temp.	Cond.				Turbidity	DTW	0.1/0.1/0		
0950 8290 16.36 0.200 0.65 3.11 63 10.7 93.5 0955 8930 16.96 0.201 0.70 8.13 6.3 99.6 98.5 1000 9570 17.06 0.201 0.74 8.12 62 80.4 98.5 1001 10.850 17.13 0.202 0.66 8.11 60 63.9 98.5 1010 10.850 17.13 0.202 0.66 8.11 60 63.9 98.5 clear, ne oder Sample information: method, container number, size, and type, preservative used. Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS-TOP Assay None 125-mL HDPE 4 VOC HCl 40-mL VOA 3 SVOC None 11-L Amber Glass 2 Observations/Notes: 128 mL /min 16w ratc Pump Start Time: 0.830 Final Discharge Time: 3.5 Final Fill Time: 1.3 Final Fill Time: 1.3 Final Fill Time: 1.3 Final Fill Time: 1.5 Final Fill Time: 1.5 CO (ppm)= 0.0 Oc	Time	_		1			l _{mV}	1	ft BTOC	Color / Odor / Comments		
C 9 S 8 9 O 16 O 20 O 70 8 13 G 3 99 6 98 5	0950						63					
1000 9570 17.06 0.201 0.70 8.12 6.2 80.4 98.5 1005 10210 17.03 0.201 0.70 8.12 6.1 75.8 93.5 1010 10850 17.13 0.202 0.66 8.11 6.0 63.9 98.5 ctear, no oder				0.201				99.6	98.5			
1005 10210 17.0 3 0.20 1 0.70 8.12 6.1 75.8 9.8.5					7		62	80.4	98.5			
Sample information: method, container number, size, and type, preservative used.				0.201	0.70	8-12	61	75.8	98.5	= 10		
Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS TOP Assay None 125-mL HDPE 4 VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL / min flow rodc Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:	1010	10850	17.13	0.202	0.66	8-11	60	68.9	98-5	clear, no odor		
Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS TOP Assay None 125-mL HDPE 4 VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL / min flow rodc Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:												
Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS TOP Assay None 125-mL HDPE 4 VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL / min flow rodc Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:												
Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS TOP Assay None 125-mL HDPE 4 VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL / min flow rodc Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:												
Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS TOP Assay None 125-mL HDPE 4 VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL / min flow rod-c Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:					<u> </u>							
Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS TOP Assay None 125-mL HDPE 4 VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL / min flow rod-c Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:								-				
Analysis Preservative Container requirements No. of containers PFAS None 125-mL HDPE 2 PFAS TOP Assay None 125-mL HDPE 4 VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL / min flow rod-c Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:	Sample info	ormation: metho	nd container	number size	and type nre	servative use	1					
PFAS	Sample IIII			ilumber, size,				Container require	ments	No. of containers		
PFAS TOP Assay VOC HCI 40-mL VOA SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL /min flow rate Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Initial Discharge Time (sec): 35 Final Fill Time: 13 Final Discharge Time: 35 Final Discharge Time: 35 Final Discharge Time: 35 Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:	PEAS	7410					<u> </u>					
VOC HCI 40-mL VOA 3 SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL /min flow roate Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0 0 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Initial Discharge Time: 130 ft btoc Final Discharge Time: 3 Duplicate ID:		Assav								4		
SVOC None 1-L Amber Glass 2 Observations/Notes: ~128 mL /min flow rate Pump Start Time: 0\$30 Air Monitoring: VOC (ppm)= 0 -0 Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0 -0 Initial Discharge Time (sec): 3 5 Final Discharge Time: 3 5 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 Duplicate ID:					HCI					3		
Pump Start Time: 0\$30 Initial Fill Time (sec): 13 Initial Discharge Time (sec): 35 Final Fill Time: 13 Final Fill Time: 13 Final Discharge Time: 35 Final Discharge Time: 10 10 Final Discharge Time: 10					None		1-L Amber G	Blass		2		
Initial Fill Time (sec): 13 Final Fill Time: 13 VOC (ppm)= 0-0 H2S (ppm) Initial Discharge Time (sec): 35 Final Discharge Time: 35 H2S (ppm) LEL (%)= CO (ppm)= O2 (%)= Pump Depth: 130 ft btoc Sample Time: 1017 MS/MSD Duplicate ID:	Observatio	ns/Notes: ~129	8 ml/min -	flow rate			11,000,23					
Sample Time: 1017 MS/MSD Duplicate ID:	Initial Fill Time (sec): 13 Initial Discharge Time (sec): 3 5					Final Fill Time: 13 VOC (ppm)= Final Discharge Time: 35 H2S (ppm) LEL (%)= CO (ppm)=						
MS/MSD Duplicate ID:	Lamb net	אוווי ואר אנו										
MS/MSD Duplicate ID:	Sample Ti	me: 1017										
Sign of upolos: \ / \ \												
		s): \(\sigma_{\sigma}	S									



Signature(s):

ch	2M:
	SM

U		SM							
Cliente	NAVEAC					695610.05.F		Page: \	of 2.
Client:	NAVFAC NASWI Ault	Field		Proje		6-5-41	1.15	rage. (01 2
nt:		ındwater Sampli	na	•			-A06-6-5-41	- 0719	
Date:			ilg	Sam		G. Gardner,		0118	
	7/18/18		·~	. Oan	ipinig ream.	O. Gardioi, i	IX. IXCIIIIICII		
	111	+60.04 KDR		•		- Ma	easuring Device:	Solinet W/L	
Depth to w	-		FT.(BTOC)			IVIE	asulling Device.	Horiba U-53	
Water Col		() 100.04 14.73	FT.	noniba 0-55					
Water Con	-	(x) 0.163	GAL/FT.			Well Dia.	Volume	Well Dia.	
Well Volur			GAL. or	3 1		(inches)	(gallons/foot)	(inches)	Volume (gallons/foot)
Total Purg	_	2.40	GAL. or			1	0.041	6	1.469
Total Fully	- VOI	4.9	OAL. OF	10-67		1.25	0.064		1.700
Purge Dev	vico:	GeoTech PFC-F	ree Bladder E	Pumn S/N: 15	20	2	0.163	- 1	
ruige Dev	ice.	Georeul FFC-F	ree bladder r	4 0.653					
	-						0.055	J	
				PARAMET	ER STABILIZ	ZATION CRIT	ERIA	great to action	
		Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Pai	rameter	°C	mS/cm	mg/L	SU	m∨	NTU	ft BTOC	
				±0.05 (if <1)			±10 % or		
(FITAPIS I III C				±0.2 (if >1)	±0.1	±10	≤ 10 NTU	±0.5 (low flow)	
			120.02 (11 1)		IELD PARA	METERS			
	Purge Vol	. Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Time	mh (gals)	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Odor / Comments
1303	~3785	20.61	0.245	8.59	7.78	90	60:1	100-05	clear, no odor
	4505			7.61	7-74	89		100.05	COENT, TIO OCOT
1306	5225	19.26	0.241	1.01	1.19	0.1	44.9	100.03)
1309		16.83	0.253	6.26	7.47	85	# 27.5	100.05	
1315	7385	16.33	0.258	6.58	7.47	100	7	100.05	
1318		15.57			7.48	105	23-5	100.05	225 ml/min flaw
1324	8060	15.35	0.258	6.10	7.53	105	19.6	100.05	223 THIN FIOLD
1327	8735 9410	15.74	0.260	6.09	7.53	102	13.0	100.05	
	10085	16.48		7.58	7.56	100	17.5	100.05	stopped using flow celli
1330 1333		19.97	0.261	7.237.12 ion	1.50	127	9.18	100.05	using sample cup instead
	10760	18.71	0.236	7.90	7.12	99	6.63	100.05	1 Straig Conf. 1 Straig
1336 Sample inf	11435	ethod, container					0.0	1 100.0 3	
Sample iiii		Analysis	iumber, size,		rvative		Container require	ments	No. of containers
PFAS		alaiyoio		None	14440	125-mL HDF		THO I TO	2
PEAS TOF	Accou			None		125-mL HDF			4
VOC	Assay			HCI		40-mL VOA			3
svoc				None		1-L Amber G	Slace		2
	ns/Notes:	2/12/ 1 :	0.		a.c.	TI-E / IIIIboi C	1433		
Observatio	/////////////////////////////////////	240 mL/min	1 How ra	te at sm	arr				
Pump Sta	rt Time: 12	:45						Air Monitoring:	
		ime (sec):	l		Final Fill Ti	me: ∖(VOC (ppm)= O	1
		harge Time (se				arge Time: 🦪	30	H2S (ppm)	***
			, 0-			-		LEL (%)=	
								CO (ppm)=	
		KPR						O2 (%)=	
Pump Dep	oth: 110-2	110.16 P	t btoc					• •	
	me: 1350)	-at **				D!! 1 15		
MS/MSD		_		L			Duplicate ID:		



GY		S SM							
						LING DATA		_	
Client:	NAVFAC			Proje		695610.05.F		Page: 2	of 2
	NASWI Ault F					6-5-4			
nt:		dwater Sampli	ng		Sample ID:	WI-AI - W	1-A06-6-5-1	11-0718	
Date:	7/18/18			Sam	pling Team:	G. Gardner,	K. Remmen		
Weather:	sunny par	thy cloudy, 1	, ,						
Total Dep		114.77	FT.(BTOC)			Me	easuring Device:	Solinst WLI	
Depth to v		100.04	FT.(BTOC)				J	Horiba U-53	
Water Col		14.73	FT.						
Water Ooi		() 0.163	GAL/FT.			Well Dia.	Volume	Well Dia.	\(\tag{\chi} \)
Well Volu		2.40	GAL. or	9 L		(inches)	(gallons/foot)	(inches)	Volume (gallons/foot)
Total Purg	-	4.9	GAL. OY			1	0.041	6	1.469
rotarr arg	_	1 4 1		10,000		1.25	0.064		
Purge Dev	vice. G	SeoTech PFC-F	Free Bladder F	Pump S/N: 1529 2 0.163					
i dige be	<u> </u>	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	100 2.000.			4	0.653	1	
	_								
				PARAMET	ER STABILI	ZATION CRIT	ΓERIA		
		Temp.	Cond.	DO I	рН	ORP	Turbidity	DTW	
Pa	rameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	×
				±0.05 (if <1)			±10 % or		
	Criteria	±0.1		±0.2 (if >1)	±0.1	±10	≤ 10 NTU	±0.5 (low flow)	
		-11.27-1.17	1±0.02 (11 > 1)		IELD PARA	METERS			
	Purge Vol.	Tomp	Cond.	I DO I	pH	ORP	Turbidity	DTW	
Time	1	Temp.	1	1 1	SU	mV	NTU	ft BTOC	Color / Odor / Comments
62	(gals)	°C	mS/cm	mg/L 7-77		104	4.89	100.05	
1339	12110	16.99	0.253		7.68	106	3.25	100.03	
1342	12785	16.93	0.257	7,79	1.72	100	3.23		
$\overline{}$		<u> </u>	<u> </u>						
			<u> </u>				 	 	
			 			<u> </u>		 	
				1					
						-			
On maria	famoraliani maal	had container	number size	and time proj	convotivo uso	d		THE RESERVE THE STATE OF THE ST	
Sample in	formation: met		number, size,				Containor require	monte	No. of containers
DE4.0	Ar	nalysis			rvative	125-mL HDI	Container require	ments	2
PFAS	D. A			None		125-IIIL HDI			4
PFAS TO	P Assay			None		40-mL VOA			3
VOC				HCI None		1-L Amber (2
SVOC	/NI-4 0		0.			II-L Amber C	31055		
Observation	ons/Notes:~2	25 mi/ mi	n How ra	te,					
								Air Monitoring:	
Pump Sta	art Time: 12				Final Fill Ti	U		VOC (ppm)= 0	
		me (sec): 1\	-1- 0 0				9 /	H2S (ppm)	, 0
11	Initial Disch	arge Time (se	c): 5 U		Final Disch	arge Time:	30	LEL (%)=	9
								CO (ppm)=	
								O2 (%)=	
_		for before						OZ (70)-	
Pump De	pth: 110,16	Α, Σ.σο							
	3-7-								
Sample T	ime: 1350						Duplicate ID:		
MS/MSD	(1) 1/0			<u> </u>			Duplicate ID.		
Cianature	(s): XCG 8								



06	21		
1/4		M	SM
			Sivi

Client:	NAVFAC					LING DATA 9 695610.05.F		Page: 1	of \
	NASWI Ault Fi	eld		, .	Well ID:	6-5-42			
nt:	Area 6 Ground		na			WI-AF- W	1-A06-6-S-4	2-0718	
Date:	7/19/18	mater Gampin		Sam	pling Team:	G. Gardner,	K. Remmen		
Neather:	overcast, N	NW breeze,	v 59°F						
Γotal Dept	•	29.89	FT.(BTOC)			Me	easuring Device:	Solinst WLI	
Depth to w		109.68	FT.(BTOC)				_	Horiba U-53	
Vater Colu		20.21	FT.						
		0.163	GAL/FT.			Well Dia.	Volume	Well Dia.	Volume (gallons/foot)
Vell Volun		3.29	GAL. or i.	2-45 L		(inches)	(gallons/foot)	(inches)	Volume (gamons/100t)
otal Purg		6-6	GAL. or	24-9L		- 1	0.041	6	1.469
,		W W	_			1.25	0.064		(
urge Dev	rice: Ge	eoTech PFC-F	ree Bladder F	ump S/N: 152	29	2	0.163		
•						4	0.653]	
				DARAMET	ER STARII I	ZATION CRIT	ΓΕRIA		
		Temp.	Cond.	DO	pH	ORP	Turbidity	I DTW	
Dar	rameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	
Га	ameter	 		±0.05 (if <1)			±10 % or		
Criteria ± 0.1 ± 0.02 (if >1)		' '	±0.1	±10	≤ 10 NTU	±0.5 (low flow)			
		l	1±0.02 (II > 1)		IELD PARA	METERS	1 = 101110		
	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	DTW	
Time	_	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Odor / Comment
2005	mL (gals)		0.383	3.29	3 64	326	247	110-75 KR	cloudy, no odor
0855	~ 1892	15.67	0.534	3.03	4.61	252	244	109.75	0 110
0900 0905	2927 3962	14.45	0.66	2.06	6.74	79	207	109.8	
0910	4997	14.44	0.694	2.96	7.01	90	182	109.8	
0915		14.26	0.69.8	2.74	6.81	75	166	109.8	~200 ml min flow
0920	6997	14.30	0.702	2.68	7.23	75	150	109.8	1
0925	7997	14.48	0.699	7.06	7.26	74	121	109.8	
0930	8997	14.29	0.710	2.26	6.83	80	108	109.8	
0933	9597	14.26	0.712	1.96	6.88	76	107	109.8	
0936	10197	14.25	0-714	1.82	6-84	16	95.7	109.8	
0940	10997	14.19	0.715	1.77	6.84	74	85-2	109.8	
Sample inf	ormation: meth	od, container	number, size,		servative use				
		alysis			rvative		Container require	ments	No. of containers
PFAS				None		125-mL HDF	PE		2
FAS TOP	P Assay			None		125-mL HDF	PE		4
/OC				HCI		40-mL VOA			3
SVOC				None		1-L Amber C	Blass		2
	ns/Notes: v	- "	in flow ra	te				Air Monitoring:	

Pump Depth: 120.2 ft btoc

Initial Discharge Time (sec): 32

Final Discharge Time: 30

H2S (ppm) accurate reading in LEL (%)= with olive to insecticiale. CØ (ppm)=

O2 (%)= @ 0815: 0.1 ppm in BZ

@ 1000: 0.2 ppm at pump

discharge and BZ

0945 -native; 0955 -duplicate Sample Time:

Duplicate ID: W1-A06-6-5-42P-0718 MS/MSD nature(s):



GROUNDWATER SAMPLING DATA SHEET

Project Number: 695610.05.FI.FS Well ID: WH 6-5-43 Page:

ation: NASWI Ault Field Area 6 Groundwater Sampling Lat:

overcast

NAVFAC

WI-A06-6-5-43-0718 Sample ID: WI-AF-

Date: 7/19/18 Sampling Team: G. Gardner, K. Remmen

Well Dia.

(inches)

Total Depth:

Weather:

Client:

FT.(BTOC) 130-29 FT.(BTOC) (-) 99.13

~ 65°F

Measuring Device: Solinst WLI

Depth to water: Water Column:

31.16 FT. Horiba U-53

Well Volume:

GAL/FT. (x) 0.163 GAL. or 19.23 L 5-08

Well Dia. Volume Volume (gallons/foot) (gallons/foot) (inches) 0.041 1.469 6

Total Purge Vol.:

GAL.

1 0.064 1.25 2 0.163 0.653

Purge Device:

GeoTech PFC-Free Bladder Pump S/N: 1529

				PARAMET	ER STABILIZ	ATION CRIT	ERIA		
		Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Par	rameter	°C.	mS/cm	mg/L	SU	mV	NTU	ft BTOC	_
	riteria	±0.1		±0.05 (if <1)	±0.1	±10	±10 % or ≤ 10 NTU	±0.5 (low flow)	
		7, W// W/							
	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	DTW	Calan / Odan / Cammanta
Time	mL (gals)	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Odor / Comments
1321	~1900	17.95	0.471	2.96	7.25	141	131	99.25	cloudy, no odor
1324	2560	16.45	0.493	9.86	7.14	63	128	99.15	V .
1327	3220	16.32	0.506	9.67	7.10	58	1)(99.15	
1330		15.98	0.515	9.46	7.06	58	102	99.16	
1333		15.72	6.529	9,51	6-97	60	105	99.16	
1336	5200	15.66	0.549	9.11	6.93	51	96-7	99.15	
1338	5640	15.58	0.551	6.50	6.95	48	95-3_	99.15	
1340	6080	15.41	0.566	4.59	7.07	38	80-2	99-15	
1343	6740	15.69	0.570	9,20	7.10	31	80.5	99.15	
1346	7400	15-65	0.567	6.91	7.15	28	86.2	99.15	
1349	8060	15.40	0.581	2-3-KDR		32	75.7	9915	
Sample inf	ormation: metho	d. container	number, size,	and type, pres	servative used	i.			

Preservative Container requirements No. of containers Analysis 125-mL HDPE 2 PFAS None 4 125-mL HDPE PFAS TOP Assay None 3 40-mL VOA HCI VOC 1-L Amber Glass None SVOC

Observations/Notes:~220 mi [min flow

Pump Start Time: 1305

Initial Fill Time (sec): 12

Initial Discharge Time (sec): 32

Final Fill Time:

Final Discharge Time:

Air Monitoring:

VOC (ppm)= 0-9 ppm

H2S (ppm) LEL (%)= CO (ppm)= O2 (%)=

Pump Depth: 120.0 ft btoc

1405 - parent ; 1410 - MS/MSD Sample Time:

WI-A06-6-5-43-0718-M5 WI-A06-6-5-43-0718-MSD Duplicate ID: MS/MSD

anature(s):



ht:

	12	AA	
U		AA	V _{SM}

GROUNDWATER SAMPLING DATA SHEET 2 of 2 Page: **NAVFAC** Project Number: 695610.05.FI.FS Client: Well ID: 6-5-43 ation: NASWI Ault Field

Sample ID: WI-AF- WI-A06-6-5-43-0718 Area 6 Groundwater Sampling

Sampling Team: G. Gardner, K. Remmen Date: 7/19/18 Weather: overcast, ~6501=

Measuring Device: Solinst WLI 130-29 FT.(BTOC) **Total Depth:**

Horiba U-53 Depth to water: 99.13 FT.(BTOC) Water Column: FT. 31-16

GAL/FT. (x) 0.163 GAL. or 19.23L Well Volume: 5.08

GAL. CY 24 406 27.42 L **Total Purge Vol.:** 7.24

GeoTech PFC-Free Bladder Pump S/N: 1529 **Purge Device:**

Well Dia. (inches)	Volume (gallons/foot)	Well Dia. (inches)	Volume (gallons/foot)
1	0.041	6	1.469
1.25	0.064		
2	0.163		
1	0.653		

				PARAMET	ER STABILIZ	ZATION CRIT	ERIA		
		Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Par	rameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	
Criteria		±0.1		±0.05 (if <1)	±0.1	±10	±10 % or	±0.5 (low flow)	
C	illeria	±0.1	±0.02 (if >1)	±0.2 (if >1)	10.1	-10	≤ 10 NTU	20.0 (1011 11011)	
					IELD PARA	WETERS			
Т:	Purge Vol.	Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	Color / Odor / Comments
Time	nL(g als)	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Cdor / Comments
1352	8720	15.62	0.581	5.84	7.25	36	74.2	99.15	
1354	9160	15.67	0.585	9.30	7.28	32	73.5	99.15	
1356	9600				7.21	21			KDR bad measurement
1359	10260	15.39	6.604	3.07	7.17	15	67.6	99.15	
1401	10700	15-32	0.607	5.07	7.20	12	61.3	99.15	
1403	11140	15.23	0.607	6.60	7.20	8	60.5	99.15	Do continuing to
									fluctuate greatly;
									proceeding w
									'sample?
			ļ						
0 1 : (<u> </u>		

Sample information: method, container number, size, and type, preservative used. Container requirements No. of containers Preservative Analysis 125-mL HDPE **PFAS** None 4 125-mL HDPE PFAS TOP Assay None 3 40-mL VOA HCI VOC 2

Observations/Notes: 220 ml/min flow

Pump Start Time: 1305

SVOC

Initial Fill Time (sec): 12

Initial Discharge Time (sec): 3 2

Final Fill Time: 16

Final Discharge Time: 30

1-L Amber Glass

Air Monitoring: VOC (ppm)= ∅.9

H2S (ppm)

LEL (%)= CO (ppm)= O2 (%)=

Pump Depth: 120.0 ft btoc

Sample Time: 1405 - parent, 1410 - MS/MSD

MS/MSD W-A06-6-5-43-0718-MS WI-A06-6-5-46-0718 MSD Duplicate ID:

None

Signature(s):

ch2m

GROUNDWATER SAMPLING DATA SHEET NAVFAC Project Number: 695@10,05, FI, FS Location: Well ID: 6-5-44 Sample ID: WI-A 06-6-5-44-1217 pling Team: D. Butler blarber, WA Well ID: Event: Area 6 0W Sumpling Date: Sampling Team: Weather: C(000, 30 S. Fitzgimmon 98,23 Measuring Device: Horr ba U-52 Total Depth: FT.(BTOC) 0102928 ()83.7 Depth to water: FT.(BTOC) Date and Time: 12/8/07 Water Column: FT. 9,48 GALIFT. Well Dia. Volume Well Volume: GAL. (inches) (gallons/foot) Total Purge Vol.: GAL. 0.041 1 1.25 0.064 PFC-Free Bladder Purge Device: 2 0.163

0.653

	Mark Sans			1000000	SAMPLE	ATA		1723223	NAME OF TAXABLE PARTY.	220000000000000000000000000000000000000
Date: Time:	218111 080B	Temp.	Cond. mS/cm	DO mail	pН	ORP	Turbidity	Other:	Color / Odor	/ Commen
	o Adolizato	_	140. 0	±0.2	*O.1	mV	NTU VA	-	-	
	0 10/11-110		0.01		FIELD PARA		2011			100.000
Time	Purge Vol.	Temp.	Cond.	DO	pH	ORP	Turbidity	Other Drw	21.121	
	al (galajasa		mS/cm	mg/L	SU	mV	NTU	other broc	Color / Odor	/ Commen
1024	I ME SHARE MALE MIN ON THE REAL PROPERTY OF	4.75	0.870	8,46	6.32	283	0.0	83:74	Clear,	no ode
10 29	THE PERSON NAMED IN COLUMN 2 I	10,54	0.874	7,59	7.61	275	0,0	83.76	10	
	3000	10,44	0.874	7.44	7.81	272	0,0	83,72	"	"
1	4500	10:47	0.874	7.34	7.87	270	0,0	83.72	11	11
10:44		10.46	0.3.11	1.29	7,90	268		83.72	14	
	AII bu	gams s	table	proc	rea re	samp	Ple	-		
-	+							-		
		TO LOUIS COME			10.15 40.20				100000000000000000000000000000000000000	
						1				1000000
Sample in	nformation: met		number, size,			ed.		The second		
	An	alysis			rvative		Container require		No. of a	ontainers
	Method	537			00	125.		NAME AND ADDRESS OF THE OWNER, TH	7	
M	thod 5	37 I	OP	4'	C	125	ml unpr	-60		
			3.575.5			19393			-	
						100000000000000000000000000000000000000			-	
Channel	ione/hintes: LL	14 aumt d	10846,90	tweeter	, waiting	For Hori	he to cal.	Start pur	ge at 1	0122.
LUBSI YOU	Distriction The	Larl	,,,		1					,,,,
Pump St	art Time: 084	10		VOC Readin	ng: 0.0	PPM		Flow	Rate	
C -00 F	End Temp! 11	051				1		Time	1 ml	Imia
Pump De	end Time: 11	hiter							. 30	laig
								102	4 30	0
Sample /	Time: (0)	50				and the second				
MS/MSD	NA			Duplicate ID	No.: NA	No. of Street,				
	(5) Deud									

Total Depth: Depth to water: Water Column: Well Volume: Total Purge Vol.:	NAVFAC FEFTINA 40 15 1 CA NA NA NA NA NA OTS	ent (0)	Proje Pak Harbon	ATER SAMPI ect Number: r Well ID: Sample ID: pling Team:	6956 GTS W I- D.But S. Fi	Effluen AOG-E 1ler 125:mm	FF01-	1217 / - TOP
	1000			SAMPLEI	DATA			
Date: Time: Method:	Temp.	Cond. mS/cm	mg/L	pH SU	ORP mV	Turbidity NTU	Other:	Color / Odor / Comments
				FIELD PARA	AETERS			
Time Purge Vol. (gals)	Temp. °C 8 , 90	Cond. mS/cm	DO mg/L 23,61	pH SU 7. 96	ORP mV 205	Turbidity NTU 25,4	Other:	Color / Odor / Comments
Sample information: mer Ar Method	nalysis	number, size,	and type, pre	rvative C	2	Container requirer 125 mL 125 mL unp	un bres	No. of containers
Observations/Notes: Pump Start Time. Pump Depth: NA Sample /Time: 12 MS/MSD MA Sture(s):		ected.	VOC Readir			1210 6-8pp0	17-125	7 / - top

ch2m

Cheft: Location: Event: Date: Weather: Total Depth Depth to wa Water Colu Well Volum Total Purge Purge Devi	Cak		Sampli	nd	ect Number: Well ID: Sample ID: pling Team:	Well Dia. (inches) 1 1.25	Page 10.05 The lye and lye assuring Device: Date and Time: Volume (gallons/foot) 0.041 0.064 0.163	AT (12)	u-52
					CAMPIE	4	0.653		
Date: Time:		Temp.	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	Other:	Color / Odor / Comments
					FIELD PARAI	METERS			
Time 12.15	Purge Vol. (gals)	Temp. °C	Cond. mS/cm Ø.878	DO mg/L 12.61	pH SU 8.02	ORP mV 9	Turbidity NTU	Other:	Color / Odor / Comments
	ormation: meth	od, container	number, size,	Prese	eservative use		Container requirer	THE RESERVE THE PERSON NAMED IN COLUMN	No. of containers
	ethod	\$37 7	OP		e C		5 mL maps	er poly	<u>ਪ</u>
Observation			*						
Pump Dep		(D)	, 1-	VOC Readin	ng: 0.0	ppm (b	reathing	20ne)	
Sample /Ti	NA	70	:15 De	Duplicate ID	No.: NA				

	AND STREET OF STREET		ATER SAMP							
Client:	NAVFAC	Pro	ect Number:	69561	0,05, FI	FS				
Location: Oak H	arbor, WA		Well ID:							
Event: Area 6	off-base	20	Sample ID:	WI-F	-wn-30f	01-0218				
Date: 2/21/18	3	San	npling Team:		ler					
Weather: Cloudy, 26				LiBay						
						Marilan	4.53			
	26,25 FT.(BTOC)			ME	easuring Device:					
Depth to water: (-)	79.45 FT.(BTOC)				Date and Time:	Pine	#			
Water Column:	16.8 FT.			14/ II D'		1				
<u>(x)</u>				Well Dia.	Volume					
Well Volume:	7.63 GAL.			(inches)	(gallons/foot)					
Total Purge Vol.:	in L GAL. 19			1	0.041					
	101 PECE	6 000		1.25	0.064					
Purge Device:	porten vici	166	-	2	0.163					
B	rotech PFC-Fladder Pump =	# 6131		4	0.653	J				
	THE PERSON NAMED IN COLUMN TWO		CAMPIE	DATA						
Detail	Temp. Cond.	T DO	SAMPLE	ORP	Turbidity	wid				
Date: Time:			pН		Turbidity	Other:	Color / Odor / Comments			
	4000	mg/L	SU	mV	NTU					
Method:	IO1 20,271	+0,2 >1	=0.1	+10	\$10%00	=0.3				
			FIELD PARA	METERS						
Purge Vol	Temp. Cond.	DO	pН	ORP	Turbidity	Othorib	Colon / Odon / Commonto			
Time Purge Vol	°C mS/cm	mg/L	SU	mV	NTU	Other:	Color / Odor / Comments			
1442 initial	7,82 0.568	3,80	6,99	642	10.1	80.54				
1445 1.75	8.67 .555	2.8	7,47	48	6.9	80.65				
1448 3,50	8.71 .559	2,54	7.59	42	6,51	80.60				
1451 4.75	2.95 .558	2.31	7.67	39	4.79	80.63				
1454 7.0	9115 557	2,06	7,70	37	4155	80.75				
1457 8.75	8.95 -559	1291	7,74	34	3.93	80,73				
1500 10.5	9,26 558	1173	7.73	33	3,29	80.7				
1503 12,25	9.05 , 562	1,64	7,78	29	3.16	80.8				
1506 14.00	9.17 :560	1,54	7,75	28	2.83	80,75				
	Parameters S	tubilizes	1. Som	06						
Sample information: method	od, container number, size									
	lysis		ervative		Container requirer		No. of containers			
82	6051M	HC	1	400	nl vot	13	3			
82	70 SDM	40	C	10	- Ambei		2			
537	Mod	486		125.	al poly		2			
	,									
						T 15 - T				
Observations Motor 3	n well, but l	holad b	Var to	well in	area und	1 10 clos	e to specs			
10086/18/10/12/14/169" 7 \$	Observations/Notes: 2 in well, Not labeled, but only well in area and TO close to specs									
when accounting	Lan stilkup.			1 B-) kills	Final D	(00=000			
when accounting	Jacob Sales	VOC Readi	ng: Norma	114 02	(11)	•				
Pump Start Time.	26	Flow rate = 175 mL/min					A			
bamb Fra line 112	111/00	flow rate - 1 smrt min								
Pump Start Time: 142 Pump End Time: 153 Pump Depth: 123 P	A Place									
1		J= " , 1	D.No. ATA							
Jampio		Duplicate	D No.: NA							
MS/MSD MA	D.M.									
Signature(s): Dove	Bush									



				GROUNDW	ATER SAMP	LING DATA	SHEET		
Client:	NAVFAC			Proj	ect Number:			Page: /	of (
Location:	NASWI Area				Well ID:	MW-	B		
Event:	Area 6 Off-ba	ase Sampling			Sample ID:	WI-A06-MV	V-3B-0218		
Date:	2-22-1			Sam	pling Team:	K. Bau	mann, E.	Cutter	
Weather:	Sunny	34°F							
Total Dept			FT.(BTOC)			M	easuring Device:	U L	67
Depth to w		1 100 25	FT.(BTOC)				casaring Device.		Pludde la
Water Colu		1 183,63	FT.					TED ISCH	Bladder Pump
	-	x)	GAL/FT.			Well Dia.	Volume	1	
Well Volum			GAL.			(inches)	(gallons/foot)		
Total Purg	e Vol.:		GAL.			1	0.041		
	-		-			1.25	0.064		
Purge Dev	rice:	Reo cont	rol Pro	Bladd 22	Sumo	2	0.163		
	3	3	1	N. V. Tella	. /	4	0.653		
			李本文工作		ER STABILIZ	NOT THE OWNER OF THE OWNER OF THE OWNER.	TERIA		
		Temp.	Cond.	DO	pН	ORP	Turbidity	DTW	
Par	rameter	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	
C	riteria	±0.1	±0.01 (if <1)	±0.05 (if <1)	±0.1	±10	±10 %	10.2 (law flaw)	8
	THE THE		±0.02 (if >1)	±0.2 (if >1)	±0.1	±10	≤ 10 NTU	±0.3 (low flow)	
Land					FIELD PARAI	METERS			
Time	Purge Vol.	Temp.	Cond.	DO	рН	ORP	Turbidity	DTW	0-1/01/0
	(gals)	°C	mS/cm	mg/L	SU	mV	NTU	ft BTOC	Color / Odor / Comments
1437	1,0	8.66	0.692	5,27	7,41	83	0.0	103,25	D
1440	1.6	9,08	0.740	4,26	7146	82	0.0	103,25	8
1443	2.2	9,39	0,771	3,54	7,50	78	0,0	103,25	er'
1446	2.8	9,49	6.785	3.02	7.50	76	0.0	.0	er
1449	3,4	9,79	0.792	2,67	7,51	73	0,0	- ti	pr
1452	4.0	9,62	0.792	2.61	7,52	72	0,0	1	0
1455	4,6	9,57	0,793	2,49	7,53	70	00	11	Ø
Cample inf		had and in				The second second	We write the second		
Sample Into		hod, container	number, size,						
	Ar	nalysis		Prese	rvative	(Container requiren	nents	No. of containers
									
Observatio	na/Notos:								
Observatio	ms/notes.							Air Monitoring:	
Pump Star	rt Time:							VOC (ppm)=	
r unip Star		me(FT; sec):			Final Fill Tin			H2S (ppm)	
		arge Time(DT						LEL (%)=	
	illitiai Discii	arge rime(D)	, sec).		Final Discha	irge (ime:		CO (ppm)=	
					Purge Rate:	200 1	1,	O2 (%)=	
					Purge Rate:	200 inly	mer		
Pump Dep	oth:								
Sample /T	ime:								
MS/MSD							Duplicate ID:		
Signature(s	s):						Duplicate ID:		

Attachment 2
Drinking Water and Private
Groundwater Well Sampling Forms







Evaluation of Per- and Polyfluoroalkyl Substances, 1,4-Dioxane, and Vinyl Chloride in Groundwater and Drinking Water, Ault Field, Area 6
Naval Air Station Whidbey Island
Oak Harbor, Washington

NOTIFICATION: ATTACHMENT 2 CONTAINS SENSITIVE BUT UNCLASSIFIED INFORMATION WHICH IS PROTECTED BY THE FREEDOM OF INFORMATION ACT

FOIA Exemption 6 (5 USC 552(b)(6))
Personal Information Affecting an Individual's Privacy

TO REQUEST A COPY OF THE DOCUMENT PLEASE CONTACT

Department of the Navy
Freedom of Information Act Office

http://www.secnav.navy.mil/foia/Pages/default.aspx

Distribute to U. S. Government Agencies Only

Attachment 3 Chain of Custody

Drinking Water

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record



Sampler				_		****				الكوارات ويورون والمواجع	-	NAME OF TAXABLE PARTY.	and the second s
Katie	Rahe	î	Lab F Aller		tine D			Car	mer Tracking	No(\$)		COC No 580-27629-9102	
Phone	*		#2000		en@tes	stamericai	nc.com			113/200		1.75	
							Analysis	s Reque	sted			Job #	
Due Date Requeste	d:			3				T			-		
STANDA	RP			0.0000000000000000000000000000000000000							and the second	B - NaOH C - Zn Acetate D - Nienc Aced	M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3
PO#			es i seedim e		lytes	nelyte.	1 1	1 1				G - Amchior	R - Na2S2O3 S - H2SO4
wo#			~	or No	py An	Copy A						I - Ice J - Di Water	T - TSP Dodecahydrate U - Acetone V - MCAA
Project # 58011747				٤	o) (c	QQ					1	L - EDA	W - pH 4-5 Z - other (specify)
ssow#				du	2 - (M)	D. NK					100	Other:	
Sample Date	Sample Time			Field Filtered S	8260C_SIM_DOD	8270D_SIMDODS					Total Number	Special Ins	tructions/Note:
$\rightarrow \sim$	\times	Preserva	tion Code:	X	NA.	N	ful Est S				\mathbb{Z}		
2/5/18	15:06	4	Water	7	3	2					5		
2/5/18	15:38	G	Water	W	3	2					5		
2/5/18	16:11	G	Water	M	3	2					5		
2/5/18	16:50	6	Water	M	3	2					S		
2/11/18	1008	G	Water	M	3						3		
2/10/18	1008	G	Water	M	3						_		
2/6/18	1056	G	Water	M	3						7		
ZIVIIS	1405	G	Water	N	3								
2/10/18	1802	9	Water	N	3						3		
2/5/18	0800	G	Water	M	3						3		
			Water								1		
Poison B Unkr	own 🗀	Radiologica		_	U _R	etum To (Client	Dis.	posal By La	mples are	_		month) Months
	Date.			Tim	e				Method of	Shipment			
217/18	1 1:	3:00	CW2	m	Rece	eved by				Date/Time			Company
Date/firms	1		Company	*******	Rece	ewed by			- tradent	Date/Time			Company
Date/Time			Company		Rece	erved by		W-14-14-15-15-15-15-15-15-15-15-15-15-15-15-15-		Date/Time			Company
			L		Coo	ler Tempera	ture(s) °C and	Other Rem	r/ks		***********		1
Date/Time			Company				ture(s) °C and	Other Rem	V ks	Date/Time			Company
	Due Date Requeste TAT Requested (da STANDA 10 PO# 10006-7-108336 WO# Project # 58011747 SSOW# Sample Date 2/5/18	Due Date Requested: TAT Requested (days): STANDARD 10 DAM PO# 10006-7-108336 WO# Project # 58011747 SSOW# Sample Date Time 2/5/18 15:06 2/5/18 16:11 2/5/18 16:50 2/5/18 16:50 2/5/18 10:08 2/5/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 2/6/18 10:50 Date/fime Date/fime 2/7/18 16:50	Due Date Requested: TAT Requested (days): STRANDARD 10 DAM PO # 10006-7-108336 WO # Project # 58011747 SSOW# Sample Time G=grab Preserve 2/5/18 15:06 4 2/5/18 15:38 6 2/5/18 16:11 6 2/5/18 10:50 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 2 10 18 1008 6 Date Date	Due Date Requested: TAT Requested (days): STANDARD 10 DAM Post 10006-7-108336 Worst Sample Type (C=Comp., G=grab) Sample Type (C=Comp., G=grab) Steribase Analy Preservation Code: 2/5/18 15:06 G Water 2/5/18 16:11 G Water 2/5/18 16:50 G Water 2/5/18 1008 G Water 2/5/18 1008 G Water 2/6/18 100	Due Date Requested: TAT Requested (days): STANDARD 10 DAM POS 10006-7-108336 WO # Project # 58011747 SSOW# Sample Time G=Grab STANDARD Type Matrix (Wester	Due Date Requested (days): STANDARD 10006-7-108336 Work Sample Time Sample Corcomp. The Sample Time Time	Due Date Requested:	Prone	Phone 50 3 40 6443 E-Mail Kristine allen@testamericainc.com	Sample Date Project # South Sample Time Sample Co-comp. Sample Sample	Propert Sample Sample Time Sample Cacomy Propert Sample Time Sample Cacomy Cac	Proces 100 1	Processor Proc

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record



WE I CARED IN ENVIRONMENTAL TESTING

Phone (253) 922-2310 Fax (253) 922-5047				• 000 -													THE LEADER IN ENV	INCHMENTAL TEST	-
Client Information	Sampler Kat	e Ra	ne.	Lab F		stine D				-	C	arner Tra	cking N	lo(s)	15 A		COC No 580-27629-9102.2		
Client Contact Tiffany Hill	Phone	410 4		F-Ma	ił	len@t		ericair	nc con	n							Page Page 2 of 6		
Company CH2M Hill, Inc.						<u>~</u> _					Requ	ested					Job #		
Address 1100 NE Circle Boulevard Suite 300	Due Date Requeste	rd:			描					T	П					8.	Preservation Code	s: M - Hexane	
City Corvallis State, Zip	TAT Requested (da	76 Min															B - NaOH C - Zn Acetate D - Nitric Acid	N - None O - AsNaO2 P - Na2O4S O - Na2SO3	
OR, 97330 Phone	PO#					y to a	alytes										F - MeOH G - Amchior	R - Na2S2O3 S - H2SO4 T - TSP Dodecahydr	Tall it
Email tiffany.hill@ch2m.com	10006-7-10833 WO#)			or No)	Dy Anal	Copy An					ł				2	I - ice J - Di Water	U - Acetone V - MCAA W - pH 4-5	-
Project Name CLEAN CTO-4041 NAS Whidbey Island	Project #. 58011747				رخ) (qq	(down)	į							1	ş	L - EDA	Z - other (specify)	je.
AREA 6	SSOW#				Samp	3) - SQ	- 34K	į								8	Other:		
		Sample	Sample Type (C=comp,	Matrix (w-www. S-solld, O-weste/oil.	d Filtered	C_SIM_DO	DO SIMDOD									Mumbe			
Sample Identification	Sample Date	The state of the s	G=grab)	BT=Tissue, A=Air		828	8270	79- F	18. PES	R 908	C00	OFFICE PROPERTY	areas a	35 8		Ş	Special Inst	tructions/Note:	
WI-A06-RW05-0218	2/6/18	10:08	,	Water	W	Y_	2	Ť			380	in the second				2			
WI-A06-RW05P-0218	2/6/18	10:08	G	Water	M		2									2			
W1-A06-RW06-0218	2/6/18	10:56	6	Water	7		2									2			********
WI- AOV-RW07-0218	2/6/18	14105	G	Water	M	4	2		<u>.</u>						\perp	2			
WI - A0 to - PW08 - 0218	2/6/18	18102	G	Water	N		2	_	-	\bot	\vdash				+1	4			
				Water	H		\vdash	-		+	\vdash	-		-	+				
				Water	${\mathbb H}$	1	H	-	+	+-	H	-	\vdash		+1	200			
				Water	H	+	H	+	+	1-		+	H		+	34 3 3 4 3 3		······································	
				Water	11	+				+-	1	+		+	1				
				Water	\prod					1	Ħ				1				
Possible Hazard Identification Non-Hazard Flammable Skin Imitant Pois Deliverable Requested: I, II, III, IV, Other (specify)	on B Unkr	own 🗀	Radiologica	·/		Specia	Return	To C	lient		Δ	sposal i	If sai By Lai	mples	are ret	aine Vrchi	ed longer than 1 n	month) Months	7.
		Date			Tim	e	-			70.7		Met	hod of 8	Shipmen					
Empty Kit Relinquished by Relinquished by	Date/Time	0 13	.'00	Company CttZ L	,		erved b							Date/Tin	10			Company	
Relinquished by	Date/Time.			Company			elved b					1		Dete/Tir	ne:			Company	
Relinquished by	Date/Time			Company	il Proposition in the last of		elved b							Date/Tir	ne.	ia S. ii	V)	Company	
Custody Seals Intact: Custody Seal No						Coc	der Ten	nperatu	(e)⊕(and O	ther Ren	narka						- XI 4	
Δ Yes Δ No		12160	- LITTER WORLD LINE		2					-	-			-	-	Ь	The state of the s	Ver- 08/04/2016	-

Rev. No.: 0 Rev. Date: 06/27/2017



CHAIN OF CUSTODY

For La Work Or Storage		nly	Temp: Storage Secu	red. Yes 🗆	No [
	TAT (check one):		21 days charge may apply) ys 7 days	1	0
Cor	VACUS	State	Ph# 97330	Fax#	
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Rev. No.: 0 Rev. Date: 06/27/2017



CHAIN OF CUSTODY

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container Types: P= HDPE, PJ= HD O = Other:	DPE Jar		Bottle Preserva	,	pe: T	= Thios	ulfate,	4		Matrix Types: AQ = SL = Sludge, SO = Se						Paper, St) = Sediment,
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Loc: 580 75081

5755 8th Street East Tacoma, WA 98424

(263) 022 2310 Eav (253) 022 5047

Chain of Custody Record COOLER 1/2

THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler:	TE RA	BE/CI	HZM Alle	PM: en, Krist	ine D)					Carrie	r Traci	king N	o(s):			COC No: 580-27629-9102.5
Client Contact: Tiffany Hill	Phone: 503.	410.84	#43	E-M kris	_{ail:} stine.alle	n@te	estam	ericair	ic.cor	n								Page: Page 5 of 6
Company: CH2M Hill, Inc.				-					Ana	lvsis	Req	ues	ted					Job#:
Address: 1100 NE Circle Boulevard Suite 300	Due Date Request	ted:							T	Ť	1		T	Т				Preservation Codes:
City:	TAT Requested (d	ays):	······································	·	11													A - HCL M - Hexane B - NaOH N - None
Corvallis State, Zip:		O DAY																C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S
OR, 97330		* /			4		se											E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3
Phone:	PO#: 10006-7-10833	6				Analytes	Analytes						İ					G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate
Email tiffany.hill@ch2m.com	WO #:					Copy An											90	1 - Ice U - Acetone J - DI Water V - MCAA
Project Name: CLEAN CTO-4041 NAS Whidbey Island	Project #: 58011747				ءَ الله	Š	(qop										containers	K - EDTA W - pH 4-5 L - EDA Z - other (specify)
Site:	SSOW#:	 	W-24			(MOD)	K - (s)											Other:
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water. S=solid, O=waste/oil, BT=Tissue, A=Air	Field Filtered Se	8260C_SIM_DOD5	8270D_SIMDOD5AK - (MOD) Copy									WARRANT AND REAL PROPERTY AND	Total Number of	Special Instructions/Note:
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Possible Hazard Identification Non-Hazard Flammable Skin Irritant P	oison B Unkn	own 🗆 j	Radiologica	ı		J _{R€}	eturn	To Clie	nt	J	X_{D_l}	spos	ed if al By	s 🍒	اسد	P.	Ø.	Custody Seal: Yes KNo
Deliverable Requested: I, II, III, IV, Other (specify)					Spe	ecial	Instru	ctions/	QC R	equir	ement	is:						
Empty Kit Relinquished by:		Date:			Time:								Method					
Relinquished by: KANE RANSE Relinquished by:	Date/Time: 2/13/1 Date/Time:	8 11	100	Company Company			ved by		-e ê	<u></u>			······································	1	te/Time 2. / (* ste/Time	1/1 1/1	B	0955 Company
Relinquished by:	Date/Tim						ed by		n) 00 -	and Ov	or Pro-	orte	_ _ T	her	rm. ler T	ID <u> </u>	12	Cor 0.1 。Unc <u>1.0。</u> Blue Cking: B いちりへ 02/22/20:
Custody Seals Intact: Custody Seal No.:	580)-75081 Ch	ain of Cus		of 7	93	remp	erature	s) ·Ca	ina Oth	er Kerr	iarks:	_¥	Vet.	Pac	ks]	Pac	cking: 6 55 02/22/20 Custody Seal: Yes No_

5755 8th Street East Tacoma, WA 98424

△ Yes △ No

Chain of Custody Record COOLER 2/2



Phone (253) 922-2310 Fax (253) 922-5047 COC No Carrier Tracking No(s). KATTE RABE/CHZY Client Information Allen, Kristine D 580-27629-9102.4 E-Mail: Client Contact: 503.410.8443 Tiffany Hill kristine.allen@testamericainc.com Page 4 of 6 Company: Job#: **Analysis Requested** CH2M Hill, Inc. Address: Due Date Requested: Preservation Codes: 1100 NE Circle Boulevard Suite 300 A - HCL M - Hexane TAT Requested (days): B - NaOH N - None Corvallis C - Zn Acetate O - AsNaO2 State, Zip: 10 DAY D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 OR. 97330 SIMDODSAK - (MOD) Copy Analytes F - MeOH R - Na2S2O3 Phone: 8260C_SIM_DOD5 - (MOD) Copy Analytes G - Amphior S - H2SO4 10006-7-108336 T - TSP Dodecahydrate H - Ascorbic Acid Email: I - Ice U - Acetone J - DI Water V - MCAA tiffany.hill@ch2m.com J - Di wate K - EDTA L - EDA Other: W - pH 4-5 Project Name: Project #: Z - other (specify) 58011747 CLEAN CTO-4041 NAS Whidbey Island **Total Number** Matrix Sample (w=water. Type Sasolid, Sample (C≃comp. Time G=grab) BT=Tisaue, A=Air) Sample Identification Sample Date Special Instructions/Note: Preservation Code: N 0:09 Water 2 WI- ADI - 2-WIO-0218 WI- ADW-RWII-0218 (3:09 Water (01 WI-ACG-RW12-0218 Water Water Water Water Water Water Water Water Water Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Possible Hazard Identification Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological Return To Client Disposal By Lab Deliverable Requested: I, II, III, IV, Other (specify) Special Instructions/QC Requirements: Empty Kit Relinquished by: Method of Shipment Received by: Date/Time: Company Relinquished by: Received by: Company Relinquished by: Date/Time Received by: Date/Time: Company Custody Seals Intact: Custody Seal No.: Cooler Temperature(s) °C and Other Remarks:

Page 790 of 793

5755 8th Street East Tacoma, WA 98424 Loc: 580 75081

Chain of Custody Record

COOLER 1/2

Phone (253) 922-2310 Fax (253) 922-5047	Sampler:			li a	ab PM:							Carrier	Trackin	g No(s)			ICOC No:
Client Information	, KAT	TE RA	BE/U	tzM A	llen, Kr	istine	D .					·		• • • • •			580-27629-9102.5
Client Contact: Tiffany Hill	Phone: 503	410.84	143		Mail ristine.a	allen@	testar	nericair	c.cor	n							Page: Page 5 of 6
Company: CH2M Hitl, Inc.	•								Anai	lysis	Regi	ueste	ed .				Job#:
Address: 1100 NE Circle Boulevard Suite 300	Due Date Request	ed:	· ····							<u> </u>							Preservation Codes:
City:	TAT Requested (d	ays):		•	11												A - HCL M - Hexane B - NaOH N - None
Corvallis State, Zip:	- 1	O TAY															C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S
OR, 97330 Phone:	PO#:				[s	tes									100	E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3
Prione.	10006-7-10833	6				alyte	Analy										G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate
Email: tiffany.hill@ch2m.com	™ WO #:				Z S	g A	Sopy									90	I - Ice U - Acetone J - DI Water V - MCAA
Project Name: CLEAN CTO-4041 NAS Whidbey Island	Project#: 58011747				3	· (MOD) Copy Analytes	- (MOD) Copy Analytes									Bine	K - EDTA W - pH 4-5 L - EDA Z - other (specify)
Site:	SSOW#:				⊣휣		, X									Hoo	Other:
Sample identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Wewater, Sesolid, Oewaste/oil	eld Filts	Perform MS/MS/ 8260C SIM DODS	8270D_SIMDOD5AK						***			Total Number of	Special Instructions/Note:
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WI-AD6-TB02-0218	2/7/18	08:00	G	Water		3										3	
WI- A06-RW10-0218	2/12/18	10:09	G	Water		3										3	
WI-AO6- RWII-0218	2/12/18	1309	4	Water		3										3	
W1-A06 - RW12-0218	2/12/18	1453	4	Water	П	3			***************************************							3	
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Deliverable Requested: I, II, III, IV. Other (specify)						·	HISH	JCHOTIS/	QC R	equit	emens						
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Relinquished by:	Date/Tim						ed be	y:					- Th	ern	ı. ID	AZ	Cor <mark>0. 6 ° Unc 1.0 ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° °</mark>
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				,										عدج	()	ا را	Custody Seal: Yes_No_

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record COOLER 2/2



Phone (253) 922-2310 Fax (253) 922-5047																	THE ERCARI THE	PNVIBORATION TI	ESTING
Client Information Client Contact:	formation Sampler: KATIE QA Phone: S03.410.8										Ca	rrier Tr	acking	No(s):			COC No: 580-27629-910	2.4	
Tiffany Hill	Phone: SUB. 4	110.84	43	E-A kri:		allen@	testam	ericaino	c.com								Page: Page 4 of 6		
Company: CH2M Hill, Inc.								-	Analy	rsis F	Reque	estec	i				Job#:		
Address: 1100 NE Circle Boulevard Suite 300	Due Date Request	ed:															Preservation Co		
City Corvallis	TAT Requested (d	ays):															B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2	
State, Zip: OR, 97330	1	10 DA	ty .														D - Nitric Acid E - NaHSO4	P - Na2O4S Q - Na2SO3	
Phone:	PO #: 10006-7-10833	ŝ			٦	Analytes	nafyte										F - MeOH G - Amchlor H - Ascorbic Acid	R - Na2S2O3 S - H2SO4 T - TSP Dodecahy	ydrate
Email: tiffany.hill@ch2m.com	WO #:				2 0 0	S y y do	- (MOD) Copy Analytes									2	I - fce J - DI Water K - EDTA	U - Acetone V - MCAA W - pH 4-5	
Project Name: CLEAN CTO-4041 NAS Whidbey Island	Project #: 58011747				le (Ye	- (MOD) Copy	(MOD)									ntaine	L - EDA	Z - other (specify)	
Site:	SSOW#				Samp	5 5	5AK									ofcom	Other:		
Sample Identification	Sample Date	Sample Time	Sample Type (C≃comp, G≕grab)	Matrix (wwwater, Smaolid, O=waste/oil, BT=Tissue, A=A	Field Filtered	Perform MS/MS/ 8260C_SIM_DOD5	8270D_SIMDOD5AK		THE WASHINGTON							Total Number	Special li	nstructions/Note	e:
		\sim	Preserva	tion Code:	W	X_{A}	N									\mathbb{X}	50 40		
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WI-AOL-PWIO-0218 WI-AOLO-RWII-0218	2/12/18	13:09	61	Water			12]							2			
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Possible Hazard Identification Non-Hazard Flammable Skin Irritant Pois	on B Unkn		Radiological		5			osal (A To Clier		nay b	·3	ssed osal E					nd longer than 1 ive For	month) Months	
Deliverable Requested: I, II, III, IV, Other (specify)	OT OTHER	34412	radiological		s			ctions/C		quiren		0341 L	y Lux	<u></u>		AICH	100 7 01	Wortens	
Empty Kit Relinquished by:		Date:			Time	e:	*****					Meth	od of S	hipmer	nt:			*****	
Relinquished by: ATT RAGE Relinquished by:	Date/Time:	8 1	100	Company CH (Company	2M	1	eived by:	40	<u> </u>	(Date/Tii 2/1 Date/Tii	me: Y // (me:	}	0955	Company Sen 7	<u> </u>
Relinquished by:	Date/Time:			Company		Rece	eived by:							Date/Ti	ne .			Company	\dashv
Custody Seals Intact: Custody Seal No.:	wyw						er Temp	erature(s) °C an	d Other	Remark	s:							
Δ Yes Δ No				Page 79	<u>12 of</u>	<i>1</i> 93												02/22	2/2018



CHAIN OF CUSTODY

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nvoice to: Name		Compan			Add	ress				City		State	Ph#	Fax#
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					TO SERVE		-			Phone:		1,11,0	Fax:	
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Container Types: P= HDPE, PJ= I	HDPE Jar		Bottle Preserva	ion Ty	pe: T	= Thiosulfa	te,		Matrix Types: AQ = Aqu					D = Sediment,
O = Other:	***************************************		TZ)= Trizma:						SL = Sludge, SO = Soil, \	WW = Waste	water, B = Bloc	d/Serum, O =	Other:	6)

5755 8th Street East Tacoma, WA 98424 **Chain of Custody Record**

Tes:	tAm	neri	ica

THE LEADER IN ENVIRONMENTAL TESTING

Phone (253) 922-2310 Fax (253) 922-5047														SMENTA	TESTING						
Client Information		E (ZAB)	E		n, Kri:	Carrier Cristine D							rier Tracking No(s):					COC No: 580-27629-9102.6			
Client Contact Tiffany Hill	Phone: 503,4	110.840	43	E-Ma krist		lien@	testar	nericai	nc.con	n								6 of 6 ⊀	e Pa	GF	1/1
Company: CH2M Hill, Inc.									Anal	ysis l	Requ	quested					Job#:				
Address: 1100 NE Circle Boulevard Suite 300	Due Date Request	ed:																rvation C		-	
City: Corvallis State, Zip: OR, 97330	TAT Requested (d	ays):	YS				9		and the second			oc: 580				B - Na C - Zn D - Nil E - Na	B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3		
Phone:	PO #: 10006-7-10833	6			Ш	lytes	nalyte					51					G - An		S - H2	a2S2O3 2SO4 SP Dodeca	abudrata
Email: tiffany.hill@ch2m.com	WO #:				s or No	- (MOD) Copy Analytes	Copy A				•	Ji				2	I - ice J - Di i	Vater	U - Ad V - Mi	cetone CAA	anyorate
Project Name: CLEAN CTO-4041 NAS Whidbey Island	Project #: 58011747				W.	o (ac	MOD)									Zine	K - ED		W - pi Z - ott	iri 4-5 her (specif	fy)
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Possible Hazard Identification					Se	mple	Disp	osal (,	A fee	may b	e ass	essec	if sa	mple	s are i	retaine	ed long	er than	1 month	1)	
Non-Hazard Flammable Skin Irritant Poiso Deliverable Requested: I. II. III, IV, Other (specify)	on B Unkno	own - F	Radiological	<i>!</i>	Sp			To Clie				posal .	By La	b		Arch	ive For		Mo	onths	
Empty Kit Relinquished by:		Date:		i -	I Time:		-					Met	hod of	Shipme	ent:				······································		
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Relinquished by:	Date/Time:			Company		Rece	ived by	:				Date/Time:							Compa	iny	
Custody Seals Intact: Custody Seal No.: Δ Yes Δ No			1		Cooler Temperature(s) °C and Other Remarks:																



Vista Analytical Laboro	atory		CHAIN	OF	CU	IST	OE	Υ			For Labo Work Orde Storage ID	oratory Use er #: \\&(only 90377 WR-2	Temp: _ Storage Secu	0.5 c
roject ID: <u>CTO - 4041</u> WHIDBEY ISZA	QV		New-HAVE HEIGHT	7-10	83	336s	ample	er: <u>Ka</u>	TIE RABE (name)			TAT (check one)	Standard: Rush (surc		
voice to: Name	С	company			Addre						City	370,000	State	Ph#	Fax#
TIFFANY HILL				1100					SUITE 300		RVALLIS)	or 9		
telinquished by (printed name a	C Pah		Date 2/15/15	a		<i>y</i>)			by (printed name		ture)	nia	t	02/16/1	7 Time 09/3
delinquished by (printed name	and signature	e)	Date		Time		Re	eceived	by (printed name	and signa	ture)			Daté	Time
SHIP TO: Vista Analytical Lal 1104 Windfield Wa El Dorado Hills, CA (916) 673-1520 * F	y N 95762	3-0106	Method of Shipment:	Add /	1654	s(es) R	queste	ed /	/ on	Method 537		53 A Well.	(Muo Mo		
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Special Instructions/Comments:									SEND DOCUMENTAT AND RESULTS	S TO:	Company Address City Phone Email	corva:	HILL HE CIPCLE LLIS - h.11 PC	Fax: MZM, COM	Zip: 97330
Container Types(P) HDPE, PJ= O = Other:	HDPE Jar		Bottle Preserv		/pe: T	= Thios	ulfate,		150E				er, EF = Effluen ood/Serum, O =	t, PP = Pulp/Paper, Other:	SD = Sediment,

5755 8th Street East

Chain of Custody Record



phone 253.922.2310 fax 253.922.5047	Regu	latory Pro	ogram: []DW	NPDES	5	□R(CRA	C	Other:		TestAmerica Laboratories, Inc			
Client Contact	Project N	lanager: He	eather Perr	У	Si	te Co	onta	ct: [David Butler Date	te: 2/22/2018	COC No: AREA6_TA_20180222				
CH2M	Tel/Fax: (530) 229-3	276			La	ıb Co	onta	ct: F	Kris Allen Car	rrier: Fed Ex	1of2Pages			
1100 112th Ave NE Suite 500				around Time								Sampler: David Butler			
Bellevue, WA 98004	☐ CALEND	AR DAYS	☐ WORI	☐ WORKING DAYS								For Lab Use Only:			
(425) 453-5005 Phone	7 may 22	T if different fr	rom Below			_	Z					Walk-in Client:			
425-468-3100 FAX Project Name: NASWI		2 1	weeks			Z						Lab Sampling:			
Site: Area 6 Off-base			week			2	8								
P O # 695610.05.FI.FS	4 9		days			إؤ	S/MSD					Job / SDG No.:			
1 0 # 0000 10.00.1 Ki 0		10	day Sample			振	Σ				1.3				
Sample Identification	Sample Date	Sample Time	Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered	Perform MS /	82505IM	92/USIIN		Corte Unclife	Sample Specific Notes:			
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WI-A06-MW-13-0218	2/20/2018	11:10	G	w	5	Ν	ΥX	X	4		stony Seat. Tes NO				
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WI-A06-RW17-0218	2/20/2018	13:40	G	w	5	N	NX	X		Wet/Packs Pacl	king:				
WI-A06-RW17P-0218	2/20/2018	13:45	G	w	5	Ν	NX	X		Ci	ustody Seal: Yes XNo				
WI-A06-6-DW-38A-0218	2/20/2018	14:55	G	w	5	N	NX	х			i i i i i i i i i				
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WI-A06-FB01-022118	2/21/2018	15:00	G	w	5		NX			Wol/Packs P	Acking: BUP Custody Seal: Yes No_				
WI-A06-MW-01-0218	2/21/2018	15:10		w	5		NX		_	+ FPO	Custody Seal: 1es_5.10_	1			
Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=	NaOH; 6= 0	ther		12.74	1111										
Possible Hazard Identification:							Sam	ple £	Disp	osal (A fee may be ass	essed if samples are retain	ed longer than 1 month)			
Are any samples from a listed EPA Hazardous Waste? Please I Comments Section if the lab is to dispose of the sample.	ist any EPA	Waste Cod	les for the s	ample in	the	- 1				Chancel Assessing Section 1. The Assessment of the Section 200 and Assessm	and the first of				
Non-Hazard Flammable Skin Irritant	☐Poison B					_				\$10000 or \$10000 or					
Special Instructions/QC Requirements & Comments: Send	results to Ti	ffany Hill/C	Unknow H2M (tiffa)	nv bill@	ch2m	COR	<u>. </u>	Retun	n to C	Client Disposal t	ov Lab Archive for	Months			
Value on a strong transfer of the section and the section of the s		2.0	(.,			•,								
Custody Seals Intact: Yes No	Custody Se	al Na :							Ica	olor Town (°C). Oboldi	0.01				
	Company:	*		Date/Tin	10'	T E	ere:	ivad		oler Temp. (°C): Obs'd:	Corr'd:	Therm ID No.:			
<u>Eric Catl</u>	Journal of the state of the sta	CH2N		222	18 08	45	Ta	CAR	71	612	Company:	2:23:18 0955			
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Configuration by.				e/Tim	ie:	<u> </u>	recei	ived	ın La	aboratory by:	Company;	Date/Time:			
								0.5			Form No. CA-	lo. CA-C-WI-002, Rev. 4.15, dated 9/27/2017			

580-75281 Chain of Custody



CHAIN OF CUSTODY

For Laboratory U. O. I.	
For Laboratory Use Only Work Order #: 1800361	Temp: 0.0 / °C
Storage ID: WR-2	Storage Secured: Yes No 🗆
TAT Standard	
	rcharge may apply) lays
City State	Ph# Fax#
dding CA 5	530-229-3276
nature	Date Time
Spredeit	02/23/18 0939
nature)	Date Time
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\\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\	Comments
	(B)
	DP
MSDO	D'
(B)	
	970
Name: Tittany Hi	U
Company: CH2M	
Address: LIOO NE Ci	rile Blud Suite 300
City: Corvallia	State: OR Zip: 97330
Phone: 541-768-3109	Fax:
Email: tiffanyehill	@ch2micom

Project ID: NASWI Area 6	PO#: 695610, 0	5. FI. F5 s	ampler Dowid Butle	TAT (check one	Standard: 21 days Standard: 21 days
		, ,,,	(name)	(Crieck one	14 days 7 days Specify:
Invoice to: Name Company		Address		City	State Ph# Fax#
Heather Perry CH2M	2525	Airpark D	rive	Redding	CA 530-229-3276
Relinquished by (printed name and signature)	Date	Time	Received by (printed name a	nd signature)	Date Time
Eriz Cutter	2-22-18	0900	B. Benedut 4	set Bredeit	03/23/18 0939
Relinquished by (printed name and signature)	Date	Time	Received by (printed name a	nd signature)	Date Time
SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 (916) 673-1520 * Fax (916) 673-0106 ATTN: Sample Receiving	Method of Shipment: Fed Ex Tracking No.:	Add Analysis(es) Red	25	1/9/18/19	Solono /
		1,000 AT 1,0			
	_ocation/Sample Description	The state of the s		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Comments
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FWI-A06-RW17-0218 2/20/18 1340	-	2 P DV		X**	
Special Instructions/Comments:			SEND DOCUMENTATION AND RESULTS	O: Address: 100 City: Convall Phone: 541-70	ME Circle Blud Suite 300 State: OR Zip: 97330
Container Types: P= HDPE, PJ= HDPE Jar O = Other:	Bottle Preservati TZ = Trizma:	ion Type: T = Thiosuli	INCOME. INCOME. IN STREET OF STREET	AQ = Aqueous, DW = Drinking Wa O = Soil, WW = Wastewater, B = Bl	ter, EF = Effluent, PP = Pulp/Paper, SD = Sediment, ood/Serum, O = Other:



Vista Analytical Laborat	CHAIN (JS'	ΤΟΙ	DY			Work Order #: 1800361 Temp: 0.0 Storage ID: WR-7 Storage Secured: Yes									
Project ID: NASWI A	rea 6	-	PO#: <u>695610.0</u>	5. F	T.	F5	_Samp	oler: <u>D</u>	rui	d Butler (name)	Everywayaya		TAT (check one)	Standard Rush (su	21 day rcharge may apply ays 7 days)
Invoice to: Name Heather Perry	Con	npany	2525	A		ress	Priv	10		Reddi	City		(A	State	Ph#	Fax#
Relinquished by (printed name ar			Date	, ,	Tim	1000			d by	(printed name and signat			()	2	30-229-327 Date	Time
Fric Cutton			2-22-18		00	10 0		1313	DINI	de beil	1/2	in	e dist	_	12/22/10	0940
Relinquished by (printed name ar	nd signature)		Date		Tim	170	F	Received	d by	(printed name and signat	ure)		Law	- 2: 4-	Date	Time
SHIP TO: Vista Analytical Labo 1104 Windfield Way El Dorado Hills, CA (916) 673-1520 * Fa	95762	106	Method of Shipment:	Add			Reques	sted		Mod. 504 Method 534		V.	St. Men. St. St. St. St. St. St. St. St. St. St	Muo		
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HOW PAGE 672160	121/18/16	50		2	P	AQ		X	H			_				
Special Instructions/Comments:	0366)_								SEND OCUMENTATION ND RESULTS TO:	Compa Addr	any: _ ess: _ City: _	CHZ-	u' Circle	Blud Suite	300 Zip: 97330
Container Types: P= HDPE, PJ= H	IDPE Jar		Bottle Preserva	tion T	pe: T	= Thio	sulfate.			Matrix Types: AQ = Aqu	Er	nail: _	541-768 +14-fan Drinking Wate	Yahil	Fax:	
O = Other:			TZ = Trizma:	35						SL = Sludge, SO = Soil, V			₩.		36 55 55 5	

TestAmerica Seattle 5755 8th Street East Facoma, WA 98424 Phone (253) 922-2310 Fax (253) 922-5047	C	Chain of Custoo	dy Re	eco	rd													Americo
Client Information Dient Contact: Tiffany Hill	Sampler: Enc	Cutter/CH2M	Lab PM Allen, E-Mail: kristin	Kristi		etame	elenin	e cor	n		Carri	er Tra	cking i	No(s):			COC No: 580-28143- Page: Page 1 of 1	
Company: CH2M Hill, Inc.			Kristin	e.alle	n@te	stame			'' lysis	Red	11100	tod	8				Job#:	1
100 NE Circle Boulevard Suite 300 100 NE Circle Boulevard Suite 300	inged to favoid dup with EMH	RW18 licate		inple (Corocava)	- Vinyl Chloride	1,4 Dioxane		Ca Fe Me Me K. Sel		Dissolved (DOC)			de, Sulfate, Fluoride	phate	*	Michigan and the Section of the Sect	Preservation A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSOH G - Amchior H - Ascorbic A I - Ice I - Ice L - EDTA L - EDA Other:	M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4
Sample Identification	8/28 Sample Date	Sample (C=comp, o=	Matrix W-water, Secold, Wester(A-Air) GODE	X Elaid Ellbrad S	S250C_SIM_DODS	8270D_SIMDODS - 1,4 Dioxane	353.2 - Nitrogen, Nitrate-Nitrite	Same South Alexandring	350.1 - Nitrogen, Ammonia	9060A_Diss - Organic Carbon,	SUBCONTRACT - UV-254	2540C, 2540D TDS, TSS	300.0_28D Chloride, Sulfate,	365.1_Ortho Phosphate			Spec	cial Instructions/Note:
WI- A06-RW18 0418	4/20/18	10:27 6		MN		X		I		1								
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Trip Blank 1	4/20/18	10:00	V	MA	X	X		1										
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								+			E							
Possible Hazard Identification Non-Hazard Flammable Skin Imitant Deliverable Requested: I, II, III, IV, Other (specify)	Poison B. Uni	known Radiological										ssec	if s	ampl ab	es a	re ret	ained longer t	than 1 month) Months
Empty Kit Relinquished by:		Date:		Time		instr	uction	s/QC	Requ	irem	ents:							wonths
	In											Me	thod o	f Ship	ment			

Company
CH2M/Jacobs
Company

Received by:

Cooler Temperature(s) °C and Other Remarks:

ate/Time:

Ver: 08/04/2016

Date/Time: 4/20/2018 12:30 Date/Time:

Date/Time:

Relinquished by: Gerrit Gardner Relinquished by:

Custody Seals Intact: Custody Seal No.:

Δ Yes Δ No

M

ID: LR - 537COC Rev. No.: 0 Rev. Date: 06/27/2017 For Laboratory Use Only Nork Order #: **CHAIN OF CUSTODY** 'ista rage Secured: Yes 🗌 No 🔲 rage ID: TAT 21 days CTO-4041
Project ID: 695610, 06.FT, FS N. PO# 10006-7-108295 Sampler E. Cutte ush (surcharge may apply)

14 days 7 days Specify: 10 days (check one): 541-768-3109 OR Corvalis Relinquished by (printed name and signature CHZM 1100 NE Circle Blud Suite 300 Date Time Received by (printed name and signature) Date Time Eric Cutter 4-20-18 1230 Time Received by (printed name and signature) Relinquished by (printed name and changed to RW18 SHIP TO: Vista Analytical Laborato avoid duplicate
1104 Windfield Way
El Dorado Hills, CA
(916) 673-1529 * Fai ATTN: Martha Mai sample from 3/28/28 tion/Sample Descripti Sample ID WI-A06-RIVI9-0418 4/2018 10:27 DW TZ Presund WI-406-RIMAP-0418 10:30 10:38 HO:27 WI-A06-FB19-0418 W-A06-RW20-0418 10:10 WI-A06-FB20-0418 10:10 Name: See invoice to" Special Instructions/Comments: SEND Company: DOCUMENTATION AND RESULTS TO: City:

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma:

Container Types: P= HDPE, PJ= HDPE Jar

O = Other.

Zip:

State:

Fax

Phone:

Email

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

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

TestAmerica Seattle

5755 8th Street East Tacoma, WA 98424

Phone (253) 922-2310 Fax (253) 922-5047

Chain of Custody Record



Client Las-	S														THE LEADER IN ENVIRO	ONMENTAL TESTING
Client Information	Sampler G. Gardner, E.	Cutler A	nb PM Ulen, Kris	tine D					Car	rier Tra	cking N	lo(s)			COC No 580-28143-9294.1	
Inffany Hill Company	Phone 602-769-7302	E-	-Mail						-					1	Page	
CH2M Hill, line.			ristine.all	len@te	stame	ricaino	.com								Page 1 of 1	
Address 1100 NE Circle Boulevard Suite 300	Due Date Requested:		-	-		A	nalys	Is R	eque	sted						
Cry Corvallis	TAT Requested (days):	-		PROFINESS AND ADDRESS AND ADDR											Preservation Codes: A - HCl. M -	Hexane
State, Zip	20 20 20 20 20 20 20 20 20 20 20 20 20 2			CONTROL BATTLE			3						1	STATE OF THE PARTY	B - NaOH N - I	None AsNaO2
OR. 97330 Phone 7.57	10 days		and the second	origina original			# X	١	3					Supplement of the supplement o	D - Nitric Acid P -	Na2045 Na2003
Phone 757-671-6278	PO N 10006-7-108336		-11	CIPCE DE LA COMPANION DE LA CO			5		2				5			N#28203 H2604 •
uffany.hill@ch2m.com	WO#		- [2]				e i	1	Dissolved (DUC)		Fluoride		Metris		I · Ice U ·	TSP Dodecahydrate Acetone
Project Name CLEAN CTO-4041 NAS Whidbey Island	Project #			2 5 E	2	4	A, Ce	- 55						1	J - DI Water V - K - EDTA W -	MCAA pH 4 5
NAS whidbey Island	58011747 S30VW		- 8	in the	D. O.	Nitrate-Nitrite) Jed		Carbon	155	Suifat	2	-Tokel	1	J - DI Water V - K - EDTA W - L - EDA Z - Other:	other (specify)
was a trabey Island	****	v	Sea.	8 8	2		Pisso	Y Y	3	. F.	je.	40	0	3	Other:	
		Sample Matri	ix	Partorn MS MS 8260C_SHM_DOD5	8Z70D_SHMDODS	353.2 - Nitrogen,	6019C_DOD5 - Dissolved (Al,	350.1 - Nitrogen, Amr	9060A_Diss - Organic Ca	2540C, 2540D TDS,	368.9_28D Chloride, Sulfate,	365.1_Ortho Phosphate		Total Number		
Sample Identification	Sample	Type (w-mat	id,	O_SHI_D	S.	2 - NE	1 20	7	a 3	30,25	92 6	8,	70109	是		
Sample identification	Sample Date Time	G=grab) BT-119800. Preservation Cod	A-Air)			353	3	, S	8 3	1 1	*	1 <u>6</u>	9	13	Special Instru	uctions/Note:
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	13:20			40	X									4	**	
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Non-Hazard Flammable Skin Irritant Deliverable Requested: I, II, III, IV, Other (specify)	-Hazard Flammable Skin Irritant Poison B Unknown Radiological							Requi	Lame.	Dispos	el By	Lab	C.	A	rchive For	Months
Empty Kit Relinquished by	Date ⁻		Ţτ	ime.			.5.40	requi	- Grine!							
	Date/Time	Compa	iny		eceived	by					Method					<i>A</i>
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Relinquished by	Date/Time.	any	F	geceived	s by						D	ate/Time			Company	
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Custody Seals Intact: Custody Seal No.:					Cooler T	empera	ture(s) ^c	C and C	Other R	emarks						1
Δ Yes Δ No																

Page 1 of 2

ID: LR - 537COC



CHAIN OF CUSTODY

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Project ID: CTO-4041 N	AVY	CLEAN	PO#: 10006-7	-108	195	- S	ampler: E	. Cutler	G. Gardner		(check on	Value 1990 pt 0.7797	arge may apply)	
riojectib. e re to tr									(name)			14 day		pecify: 10 da
Invoice to: Name		Compan	<i>₹3</i>		Addr		i			City	3. 01.	State	Ph#	Fax#
Rebecca Maco	>	CHZN	Hill/Jacobs		1100	113	th Av			Bellev	uc	WA	, 14 (III - 14 (III III III II II II II II II II II II	
Relinquished by (printed name a	and sig		Date		Time		Receiv	ed by (prin	ted name and signa	ture)	١		Date	Time
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1104 Windfield Way El Dorado Hills, CA		2	Method of Shipment:	Add .	Anaiys	is(es) Re	equested		70. E.		1 2	20		
(916) 673-1520 * Fa			Fed Ex	30	Conta	ainer(s)	220/		7000		1 4 6	§ /		
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-A06-RW19-U318-MSD	V	13.25		V	V	W					1			
Special Instructions/Comments:												ny Hill		
WO#	800	595						DOC	SEND UMENTATION			Hill / Jaco		
									RESULTS TO:		s: <u>[[UO 1</u> y:Corvalli	/E Circle	State: OR	Zip: <u>4733</u> 0
	N. N									Phon	e: 757-6	71-6278	Fax:	
										Ema				

EXACT COPY OF THE ORIGINAL INIT POB 04 / 04 / 18

Page 2 of 2

For Laboratory Use Only

ID: LR - 537COC



CHAIN OF CUSTODY

Analytical Laboratory	See pag	e			Storage Secured: Yes No
Project ID:	See Pag	Sampler:	* a	g === (tandard: 21 days tush (surcharge may apply)
Projectio.			(name)	h.	14 days7 days Specify:
Invoice to: Name Company	у	Address		City S	tate Ph# Fax#
2	Van de Na	* 1	. 7		s
Relinquished by (printed name and signature).	Date	Time Recei	ved by (printed name and sig	gnature) S-USpanUA	04 03 18 101S
Relinquished by (printed name and signature)	Date	Time Recei	ved by (printed name and sig	0,	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 Container(s)	1/8/1/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8/8	0000 MO 1000 M	
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Special Instructions/Comments: ** See Tel MUSICA SIGNATURE ON O	ane 1 CDC		SEND DOCUMENTATION AND RESULTS TO:	Company:Address:	
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*	N K Was Mark			Phone:	Fax:
			¥	Email:	6 9 10 10 10 10 10 10 10 10 10 10 10 10 10
Container Types: P= HDPE, PJ= HDPE Jar O = Other:	Bottle Preserv	ation Type: T = Thiosulfate,		Aqueous, DW = Drinking Water, EF oil, WW = Wastewater, B = Blood/S	= Effluent, PP = Pulp/Paper, SD = Sediment, erum, O = Other:

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



O = Other:

Vista Analytical Laboratory Project ID: Navy CLEAN - NASW	11 AG CV D	CHAIN OF		2	2		Fitzsimmons	Work Ord	tat (check one):	Standard: Rush (surch	21 day arge may apply	rs Specify: 10 da
Invoice to: Name	Company		_	Addr				City		State	Ph#	Fax#
Tiffany Hill	clacob	s (CH2M) 1100	112	2 th	Ave NI	Sui-	e 500 B	ellerue		WA SH	1-768-3109	1940 (1941) (1941)
Relinquished by (printed name and signatu	re)	Date		Time		Received	by (printed name and sig	nature)			Date	Time
Relinquished by (printed name and signatu	re)	Date		Time		Received	by (printed name and sig	nature)			Date	Time
SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: (916)		Method of Shipment: Tracking No.:	Add		iner(s)	sted	7		15.0 P. 10.0 P		gyptister of the lates (A)	an reference and applications of the second section of the section of the second section of the section of the second section of the secti
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	3 18 9:30	RW+19	2	P	AQ				X TZ			
Special Instructions/Comments:							SEND DOCUMENTATION AND RESULTS TO:	Address: City: Phone:			State:	Zip:
Container Types: P= HDPE, PJ= HDPE Jar		Bottle Preservation Type:	T = Ti	niosulfa	te,	Matrix	Types: AQ = Aqueous, DV	Email: W = Drinking V		uent, PP = Pulp/	Paper, SD = Sec	liment,

TZ = Trizma:

Eurofins TestAmerica, Seattle

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record

🕸 eurofins

Environment Testing TestAmerica

Phone (253) 922-2310 Fax (253) 922-5047													
Client Information	Sampler: M. ENDO, A	. VOGT	Lab PM: Allen, Kri	stine D		•	C	arrier Tra	cking No(s	s):		COC No: 580-33293-108!	58.1
Client Contact: Tiffany Hill	Phone:		E-Mail: kristine.a	llen@test	americaiı	nc.com						Page: Page 1 of 1	
Company: CH2M Hill, Inc.						Analysis	s Real	iested			***************************************	Job #:	
Address: 1100 NE Circle Boulevard Suite 300	Due Date Requested:											Preservation Cod	
City: Corvallis	TAT Requested (days):	The state of the s						Loc: 5				A - HCL B - NaOH C - Zn Acetate	M - Hexane N - None O - AsNaO2
State, Zip: OR, 97330 Phone:		-						855	53			D - Nitric Acid E - NaHSO4 F - MeOH	P + Na2O4S Q - Na2SO3 R - Na2S2O3
Email:	PO #: 10006-7-108336 WO #:									,		G - Amchlor H - Ascorbic Acid I - Ice	S - H2SO4 T - TSP Dodecahydrate U - Acetone
tiffany.hill@ch2m.com Project Name: Sample IDs	corrected to		3	Vinyl Chloride			,	1 1				J - DI Water K - EDTA	V - MCAA W - pH 4-5
CLEAN CTO-4041 NAS Whidbey Isla RW22 by la	boratory								-		E	L - EDA Other:	Z - other (specify)
ARBA 6 - Coachman inn		Sample Ma	atrix	SIM_DOD5 -							10 mg		
Sample Identification	Sample Date Tin	Type (w-	rwater, Esolid, Essate/oil, Es	ပ္							AN PIO	Special to	structions/Note:
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280-82:	553 Chair of Custory					<u> </u>	ust. Se	al: Yes	No_	*	Lab (our:	
		***************************************				i i	3lue Icc	, 60, 1)ry, No	ne	Other		
Possible Hazard Identification			Sa	ample Dis	posal ()	A fee may	be ass	essed ii	fsample	s are re	etainer	l longer than 1	month)
Non-Hazard Flammable Skin Irritant	Poison B Unknown	Radiological		Retur	n To Clie	nt	Dis _l	oosal By	Lab	L1	Archiv	_	Months
Deliverable Requested: I, II, III, IV, Other (specify)			Sp	pecial Inst	ructions/	QC Requir	ements:						
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Relinquished by:	Date/Fime: Co								Date/	Time:			Company
Custody Seal No.:	<u> </u>			Cooler Te	mperature(s) °C and Oth	ner Reman	ks:	ia ii		ris N		

Eurofins TestAmerica, Seattle

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record

Loc: 580 **85578** 🖏 eurofins

Environment Testing TestAmerica

Phone (253) 922-2310 Fax (253) 922-5047														05) D /	8		133071111071	
Client Information	Sampler: M. ENDO) A.	VOGT	All	PM: en, Kri	stine	D					Carrie	i			-	COC No: 580-33293-	10858.1	
Client Contact: Tiffany Hill	Phone:				_{lall:} stine.a	llen@	testa	merica	nc.cor	'n							Page: Page 1 of 1		
Company: CH2M Hill, Inc.									Anal	ysis	Req	uest	ed				Job#:		
Address: 1100 NE Circle Boulevard Suite 300	Due Date Request	ted:														1	Preservation		
City: Corvallis	TAT Requested (d	lays):											-		 		NIA-HCL IEIRINIINIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	M - Hexane	
State, Zip: OR, 97330		+																	
Phone:	PO#: 10006-7-10833	6																	d4-
Email: tiffany.hill@ch2m.com	WO#:				- 12 5	ŧ	ane							580	-8557	'8 Cha	in of Custody		irate
Project Name: CLEAN CTO-4041 NAS Whidbey Island Sample IDs		d to				- Vinyl Chloride	- 1,4-Dioxane						ı	1	1 1		L-EDA	Z - other (spec	;ify)
AREA 6 - Coach RW22 by la	boratory				- India	5 - Vin	AK - 1,									Contain			
			Sample	Matrix	and S	oo_	DODS									foer of			
		Sample	Type (C≃comp,	(W=water, S=solid, O=waste/oli,	d Filt	SC SIIM	NIS GO									Number			
Sample Identification	Sample Date	Time	G=grab)	BT=Tiesus, A=Alr	N. C.	8260C	8270D				20.75	1.4.1.2				Total	Specia	al Instructions/N	ote:
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Microsophia Adapting Control of the																			
ossible Hazard Identification Non-Hazard Flammable Skin Irritant Poisc					Sa					may L					s are	7	ed longer than	1 month)	
reliverable Requested: I, II, III, IV, Other (specify)	in B Unkno	own r	Radiological		Sp			To Clie		quire		posal :	By L	ab		Arch	ive For	Months	
mpty Kit Relinquished by:	Ti Ti	Date:			Time:							Me	thod of	Shipmo	ent:			<u> </u>	
elinguished by: Aaron Vog+ Atom II	Date/Time: 04/18/19	13	()	Company c M Sacab	2/	Recei	ved by	الرد	les					Data.	19.	19	0800	TASes	
	Date/Time:			Company	2	Reselv	red by	Mx						Date/		, b	- 0	Company	
ellnquished by:	Date/Time:			Company		Receiv	ed by	· ·						Date/	Time:			Company	——
Custody Seals Intact: Custody Seal No.:			<u> </u>			Cooler	Temp	perature(s) °C an	d Othe	Rema	rks:							

CHAIN OF CUSTODY

Rev. No.: 0 Rev. Date: 06/27/2017									ID: LR	- 537COC
Vista Analytical Laboratory	CHAIN C)F C	US	TOE	Υ		For Laboratory U Work Order #: Storage ID:	se Only 1900794 R-2		Yes No 🗆
Project ID: NASVI DRIMING W		- 10	8346	Sample	r: <u>M.</u> 1	(name)	OGT (check o	Standard: ne): Rush (surch	21 days arge may apply) 7 days Sp	pecify:
Invoice to: Name Company		Ad	dress				City	State	Ph#	Fax#
TIFFUNY HILL CHEM	(Jacobi)	110	0 N	EC	icule	Blud.	Corvalis	OR	541-7	8-3109
Relinquished by (printed name and signature)	Date	Tir	ne	Re	ceived by	(printed name and si	ignature)		Date	Time
Aaron Vogt Dam d	04/18/19	12	: 18	B.	Bon	edict Beth	1Ben duit	•	04/19/19	0724
Relinquished by (printed name and signature)	Date	Tir	1000	Re	ceived by	(printed name and si	ignature)	endles it conservation and the	Date	Time
					if.					
		ABOS NA	100 July 1889			,		a samuel and a samuel pro-		
Sample IDs corrected to RW22 by laboratory	Method of Shipment:	Add Anal	ysis(es)	Requeste	d /	Model Est		Solve Moles		
NVV 22 by laboratory		Co	ntainer(5)	/	2000	/ & ^T /			
ATTN: Sample Receiving	Tracking No.:		//	11	537 List: 14 List: 6		S 58/2	7		
Sample ID Date Time	Location/Sample Description	Since on S.	Od They		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	The state of the s			Comments	•
WI-A06-5/12-0419 4/7/19 1635	AFEA 6 - COACHAN	2 0				700	T X		Comment	
- A06-8-12-0419-19417/19 1635		20	_				×	301-000-21		
- ADB-S-12-0419-1504/17/19 1675	Aren 6 - Coerhman	20	DV			185)	X	1		
A06-5-128-04 19 4/17/19 1735		20	DW				X			- VIOL
-AD6-FB01-041719 4/17/19 1645	Area 6 - Coachman	2 0	00				X	H-SSHU.S		
A06-EB01-041719 4/19/19 1870	Aren 6 - Coachron	20					X	-20		
								7,110		aru al-v
	19 W W								001186 7 900	
	N 15 15 17 17 17 17 17 17 17 17 17 17 17 17 17									
		A 1000	*****					- NIII - 27 - 16 - 100 -		

Tiffuny Hill	(HZM	(Jacobi))	1	160	N	E (Circl	e	Blod.		isrual	ìs	OR	541	-76	8-3109
Relinquished by (printed name				Date		Time					printed name					Date		Time
Apron Voyt	Dao	n d	10	04/18/19		(2)	18	B	3. B	one	dict B	ELL	Bene	dig	+	04/19/	19	0724
Relinquished by (printed name	and signati	ure)		Date		Time			Receive	d by (printed name a	and signat	ture)			Date		Time
	Collective					Even			570 3440	-				in Designer	7			
Sample IDs correc	ted to				Add.	Δnalve	is(es) l	Secue	etad			8.7g			Company of the state of the sta			
RW22 by laborato			Method	of Shipment:	Add	Maiys	15(65) 1	veque	sieu		Ø.	200			200 70			
NW22 by laborate	· y			8100		Conta	ainer(s)			20	18th 00 53						
ATTN: Pample	kecei.	ving	Tracking	g No.:	Shande	7	7	7	1/	9.	11.			1/2	·//			
			2-41)	/ /	/ /	/ /	\$ 18	3/	18/8			Comes PAS (185	×/			
							/	. / 5	2/2/	12/	15 A		3	18/	\$			
Sample ID	Date	Time	The same of the sa	ple Description	J. Williams	13	Men	A Sold	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	12/1/st. 74	1.65 of 2.86 o		Salar Market	Sall Sall		Com	ments	
W1-A06-5-12-0419					2	0	DY							X	115 II - APA 2013 a	5m) 100		THE AMERICAN AND ADDRESS OF THE AMERICAN AND ADDRESS OF THE AMERICAN ADDRESS O
- A06-9-12-0419-MG	4/17/19	1635	Arm 6 .	coachnan	2	0	DV							×				
- ADB - S-12-0419-1958					2	0	DV				1.2			X				
-A06-5-128-04 19					2	0	DW					=======================================		×				9,00
-AD6-FB01-041719	4/17/19	1645	Area 6-	Coachman	2	0	DU							X	- Imarijas			
- A06 - EB01-041719	4/17/19	1830	Area 6.	Coachman	2	0	DW							X	0 - 47 7 30			***************************************
						of al											-	wal
												355			**************************************			
				W-1875				\Box						+		0.0186.7		
				three tra						+			++					
		l	7			5000										<u> </u>	10	7,91,884
Special Instructions/Comments:	V			THE RESERVE							SEND				me ne Water a			
X							343/14/2				OCUMENTATI							
	V									-	ID INCOULTO		Ci	y:		State:	Zij	0:
8																		
											-14	_	Ema	il:		W. Harden		
Container Types: P= HDPE, PJ=	The state of the s	1		Bottle Preservati	00000	pe: T =	= Thios	ulfate,							g Water, EF = Effluen		er, SD =	= Sediment,
O = Other:	sold bus	PAIR	4	TZ = Trizma:							SL = Sludge, S	SO = Soil, V	VW = Was	tewater, I	B = Blood/Serum, O =	Other:		

>>> Select a Laboratory <<<

Chain of Custody Record

<u>TestAmeri</u>	CO
	FEOTIMO

#N/A Savannah																				THE LEADER IN ENVIRONMENTAL TESTING
#N/A	Regu	latory Pro	gram: [ם שמר	NPDES		RCF	Δ [Other:											TestAmerica Laboratories, Inc.
#N/A Client Contact			infany 1			_	100	ntact:					Date	8	29	190				COC No: 18 082901
Your Company Name here Jacobs (CHZM)	Tel/Fax:	541-76	8-3103	71.11				ntact:)						er:						_ \ of COCs
Address 1100 112th Ave NE Suite 500			urnaround	Time		П	Т	TT	T	T	T	П	T	T	T		T	\top	T	Sampler: S. Fitzsimmens
City/State/Zip Bellyvue, WA 98004	☐ CALEND	AR DAYS	WORK	KING DAYS	;	1	_		+ 1		1	1	1	-				1		For Lab Use Only:
(xxx) xxx-xxxx Phone 541-768-3109	TA	T if different fr	om Below _	o day	5		<u>3</u>)	1 1	11		1		1	1				ł		Walk-in Client:
(xxx) xxx-xxxx FAX			weeks	()	<u>Ş</u>)	٤	1 1	1 1					1	1			ł		Lab Sampling:
Project Name: Navy CLEAN -NASWI AG Off Base DW		1	week			≿	۵	1 1	11				Į	1	1 1		Î			
Site: Area co		2	days			e e	ž		11		1			1	1 1		t			Job / SDG No.:
PO# 10006-7-107257		1	day			Ë	8 0		11				1	1			- 1			
Sample Identification	Sample Date	Sample Time	Sample Type (C≃Comp, G≃Grab)	Matrix	# of Cont.	Filtered Sample (Y/(N)	Sectorn Coll of													Sample Specific Notes:
W1-A06-RW05-0818	8/29/18	1100	G	Aq.	١	2	N													
WI-A06-RW18-0818	8 29 18	1325	5	Ag.	1	N	NX													
						Ц	\perp													
						Ц	\perp	\sqcup	$\perp \downarrow$			Ц			Ш					
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Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=	NaOH; 6= C	Other							1	1			10			*	ia.			
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please L Comments Section if the lab is to dispose of the sample.					in the	_	Samp	le Disp	osal	(A fee	e may	y be a	asse	ssed	if sa	mple	es ar	e ret	aine	d longer than 1 month)
Non-Hazard Flammable Skin Irritant	Poison B		Unknow	/n				eturn to	Client			Dispo	sal by	Lab			Arc	hive fo)r	Months
Special Instructions/QC Requirements & Comments:																				
Custody Seals Intact:	Custody Se	eal No.:						Co	ooler 7	Гетр.	(°C):	Obs	'd:	_	(Corr'	d:			Therm ID No.:
Relinguished by: Krystle Remmen	Company:	Jacobs		Date/Tir	ne: 18 140		Recei	ved by:						Co	mpai	ny:				Date/Time:
elinquished by:	Company:			Date/Tir			Recei	ved by:						Co	mpa	ny:				Date/Time:
elinquished by:	Company:			Date/Tir	ne:	F	Recei	ved in L	abora	atory b	y:			Co	mpa	ny:				Date/Time:

>>> Select a Laboratory <<<

Chain of Custody Record

TestAm	erica
THE LEADER IN ENVIRON	Service Disc

#N/A Seattle																				10317 (THEHEA
#N/A	_		_																	THE LEADER IN ENVIRONMENTAL TESTING
#N/A		atory Pro				_	RCRA		Other											TestAmerica Laboratories, Inc.
Client Contact	Project M	anager: T	iffany	HIU			Conta						_	ate:			_			COC No: 18082902
Your Company Name here Jacobs (CHZM	THE RESERVE TO SERVE THE PERSON NAMED IN COLUMN TWO IN COL	341-768				_ab (Conta	ict:	K.	All	ien		- c	arrie	r: F	ed	EX	7 1		of COCs
Address 1100 112 th Ave NE Suite 500	☐ CALEND	Analysis T		KING DAYS		1	H		1		1 1	- 1					- 1			Sampler: 5. Fitzsimmons
City/State/Zip Bellevue, WA 98004 (xxx) xxx-xxxx Phone 541-768-3109		if different fr				z	1				1 1	1	0					1 1		For Lab Use Only: Walk-in Client:
(xxx) xxx-xxxx Filidie 5-9,1 - 1,65 - 3,10 - 1	_ '^'		weeks	10 acig	-	SIS	1					- 1	240	1			1	11		Lab Sampling:
Project Name: Novy CLEAN-NASWI AG OFFBASE DW			week		>		00		1		H	0	SM2	1			1	1 1		- Land Carriering.
Site: Area 6		2 (days		3	MSI	6010		1		1	9060	S	-			- 1	1 1		Job / SDG No.:
PO#		1 0	day]	IS/	3	00	1 ~	1		0	2						ı	
			Sample		0	D E	2W846	3	353.2		1	9H8MS	2540	1				1 1	- 1	
	Sample	Sample	Type (C=Comp,	1	# of	rere	N	42	353	365.	350	3	7 5	1			1	1 1	- 1	1
Sample Identification	Date	Time	G=Grab)	Matrix	Cont.	Perform MS / MSD ()	50	0	u) cc	3 613		S	SM							Sample Specific Notes:
W1-A06-RW05-0818	8 29 18	1100	G	A9.		22		1	1 1	1	8	1	1							Diss. metals (6010C) and
WI-A06-RWIB-0818	8 29 18	1325	G	Ag.	5	2	4	1	1 1	1	3	1	1							SM2540c D collected in
																				1-Lamber (for each sample)
																				request lab filtration.
						Ш														For RW-18 sample only,
																				24 5350B 300 0 353.2 365.1
						Ш				Ш										collected in 1-L amber.
						Ц														
						Ш														
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=	NaOH; 6= C	ther				++		1	+	\Box	1	1	1	+-		_		+	+	
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please Li Comments Section if the lab is to dispose of the sample.	st any EPA	Waste Co	des for the	sample	in the	Sa	mple	Disp	oosal	I (A	fee r	nay	be a	sses	sed i	fsam	nples	are r	etaine	ed longer than 1 month)
Non-Hazard	Poison B		Unknov	wn		┥ .	□Reti	ırn to	Client				Nicnne	al by L	ah			Archive	for	Months
Special Instructions/QC Requirements & Comments:												- 1	71 <u>3D</u> 03	di oy c	do				101	Totalo
Custody Seals Intact:	Custody Se	the second named in column 2 is not a second							ooler	Tem	1p. (°	C): C	bs'd			Co	orr'd:			Therm ID No.:
delinguished by: Krystle Remmen	Company:	Jacobs		Date/Tir	ne: 8 1400	Re	ceive	d by:							Con	npany	<i>j</i> :			Date/Time:
elinquished by:	Company:			Date/Tir	me:		ceive	d by:							Con	npany	<i>y</i> :			Date/Time:
elinquished by:	Company:			Date/Tir	ne:	Red	ceive	d in l	abor	rator	y by:				Con	npany	/ :			Date/Time:



CHAIN OF CUSTODY

Vista Analytical Laboratory			CHAIN OF	С	US	TC	DΕ	Υ				For Lab Work Ord Storage I	oratory ler#: D: W	1812843	Temp:	ured: Yes ☑ No □
	swl Abo	tions		-108			San	npler:_	Sh	ann	m Fitzsimi (name)	300000000000000000000000000000000000000	TAT (check	cone): Rush (su	urcharge may apply	
Invoice to: Name		Compan	50		Addr							City		State	Ph#	Fax#
Tiffany Hill	Jaco	05	1100 112+4	AV			Sui				Bell			WA	541-768-3	109
Relinquished by (printed name and si	gnature)		Date		Time			Rece	ived b	y (prin	ted name and sigr	nature)			Date	Time
Krystle Remmen	Xer	2-	8/31/18		9.3	O				Hex	Shy	EIT	011	t Noils	911/18	0 9 40
Relinquished by (printed name and si	gnature)		Date		Time			Rece	ived b	y (prin	ted name and sign	nature)			Date	Time
SHIP TO: Vista Analytical Laborator 1104 Windfield Way El Dorado Hills, CA 9576 Ph: (916) 673-1520; Fax:	62 (916) 673-0	0106	Method of Shipment: Feel EX			is(es)		ested			Pr. 48. 150,000 DIII.000		/			
ATTN: Martha Majer			Tracking No.:	Ough.		//	1/2/	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	List of 24 1/1800mers	1.681 or 24 Will.	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	05.48 L/s; 61.61.6	/		
Sample ID	Date	Time	Location/Sample Description		1,8	The M	13	13/	15/	3/3		18/3	1 8		Comme	nts
WI-A06-RW05-0818	3/29/18	1100	RW-0S	2	P	DW	L						X	TZ		
WI-A06-FB05-0818	8 29 18	1105	RW-05	2	P	ACL							X	TZ		
WI-A06-RW18-0318	3 29 18	1325	RW-18	2	P	DW							×	TZ		
WI-A66-FB18-0818	8/21/18	1330	12W-18	2	P	AQ							X	TZ		
WI- A06-RWZ0-0818	3/30/18	900	RW-20	2	P	DW							X	TZ		
WI-AUG-FB20-0818	8/30/18	900	RW-20	2	P	AQ							X	TZ		
							1									

Krystle Remmen	ser	2-	8/31/18		63	30				Kest	de	E)	D	01	at Nals	9/11	150	0946
Relinquished by (printed name and sign	gnature)		Date		Time	Э		Rece	eived by	(prin	ted name and sig	nature)				Date		ime
SHIP TO: Vista Analytical Laborator 1104 Windfield Way El Dorado Hills, CA 9576 Ph: (916) 673-1520; Fax: ATTN: Martha Mayer	2 (916) 673-0	0106	Method of Shipment: Feel EX Tracking No.:		Cont	ainer(7,	7	1/8/10/25/0/25/0/25/0/25/0/25/0/25/0/25/0/2	(SO) (24 M)(C)	10/02-00-00-00-00-00-00-00-00-00-00-00-00-0		\$ 1 mg	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Sample ID	Date	Time	Location/Sample Description	J. J	1 3	e / ren	7 / Se / S	13	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	5/3	87 15 15 15 15 15 15 15 15 15 15 15 15 15	1 2	3	A 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	<u> </u>	Cor	nments	
WI-A06-RW05-0818	3/29/18	1100	RW-OS	2	P	DW								X	TZ			
WI-A06-FB05-0818	3 29 18	1105	RW-05	2	P	AC								X	TZ			
W1-A06-RW18-0318	3 29 18	1325	RW-18	2	P	DW								×	TZ			
WI-A06-FB18-0818	8/21/18	1330	12W-18	2	P	AQ								X	TZ			
WI- A06-RWZ0-0818	3/30/18	900	RW-20	2	P	DW								X	TZ			
WI-AUG-FB20-0818	8/30/18	900	RW-20	2	P	PQ								X	TZ			
				\vdash			\vdash			+		+					7 07 100	
Special Instructions/Comments:											SEND	Na	me:					
										ocu	MENTATION ESULTS TO:	Compa	any: . ess: .			10 10 10 10 10 10 10 10 10 10 10 10 10 1		
												Pho	City: . one: . nail: .			Fax:	Zip:_	
Container Types: P= HDPE, PJ= HDPE J O = Other:	lar		Bottle Preservation Type TZ = Trizma:	: T = TI	niosulf	ate,	_								EF = Effluent, PP = Pulp/ Serum, O = Other:	Paper, SD = S	Sediment,	

TestAmerica Savannah

5102 LaRoche Avenue

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Form No. CA-C-WI-002, Rev. 4.17, dated 4/27/2018

CTO 4041

Savannah, GA 31404-6019	Regulatory Program: DW NPDES RCRA Other:													TestAmerica Laboratories, Inc.							
phone 912.354.7858 fax 912.352.0165	Regul	atory Pro	gram: 🗆	DW [NPDES	[RCR	A	Oth	ner:		_	-	ate:	0/20	140	_				COC No: 18083001
Client Contact	Project Ma	anager: Ti	ffany Hill				e Cor							ate: arrie			_		_		1 of 1 COCs
Jacobs (CH2M)	Tel/Fax: 5	41-768-31	09			Lab	Cor	ntac	t: Kris	Alle	n		-10	arrie	r: re	UEX		_	T	T	Sampler: Shannon Fitzsimmons
1100 112th Ave. NE, Suite 500	/	Analysis T	urnaround							- 1		П									For Lab Use Only:
Bellevue, WA 98004	☐ CALEND	AR DAYS	✓ WORK	ING DAYS		1 1	_					П				ш					Walk-in Client:
(541) 768-3109 Phone	Т	AT if differen	from Below	10 days			Ž					П				ш					Lab Sampling:
(xxx) xxx-xxxx FAX		2	weeks			Z	ᅴ	1				П				Ш					
Project Name: Navy CLEAN - NASWI Area 6 Off-Base DW			week				ខ្ល					Ш									Job / SDG No.:
Site: Area 6			days			쀨	Σ					1 1									
P O # 10006-7-107257		1	day			- Ig	₽			-		1 1									
	Sample Date	Sample Time	Type (C=Comp, G=Grab)	Matrix	# of Cont.	iltered	Perform MS / MSD (Y / I														Sample Specific Notes:
Sample Identification	Date	Time	G=Grab)	Watrix	COIL	Ħ		+	+	+	+-	Ħ	_	+		П		\top	T	T	
WI-A06-RW20-0818	8/30/2018	900	G	w	1	N	N	1	+	-	+	Н	+	+	+	H	+	+	+	+	
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				<u> </u>		Ħ	1	t	$\dagger \dagger$	\top	T	m		\dagger	1					+	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=	NaOH: 6=	Other				-	1	1	+		+		\neg	+				+	+	+	
							Sam	ple	Dispo	sal (A fee	ma	be a	sses	sed	if sa	mpl	es a	e re	taine	ed longer than 1 month)
Are any samples from a listed EPA Hazardous Waste? Please	List any EP	A Waste C	odes for the	sample	in the																
Comments Section if the lab is to dispose of the sample.	Poison	B	Unkno	own		\neg		Retu	rn to Cli	ent		ſ	Dispo	sal by	Lab			□Arc	hive f	or	Months
Non-Hazard Flammable Skin Irritant Special Instructions/QC Requirements & Comments:	l olson																				
Special histractions/go requirements a comment																					
Custody Seals Intact: Yes No	Custody S	Seal No.:								ler T	emp.	(°C):	Obs'	d:			Corr'	d:			Therm ID No.:
Relinquished by: Krystle Remmen	Company	Date/T	ime: 8 94	5	Rece	eived	d by:						Со	mpa	ny:				Date/Time:		
Relinquished by:	Company	30001	Date/T	ime:		Rece								Со	mpa	ny:				Date/Time:	
Relinquished by:	Company	:		Date/T	ime:		Rece	eive	d in La	borat	tory b	y:			Со	mpa	ny:				Date/Time:

TestAmerica Seattle

5755 8th Street East Tacoma. WA 98424

Chain of Custody Record



Phone (253) 922-2310 Fax (253) 922-5047 Sampler. G. Gardner Carrier Tracking No(s): COC No: Client Information Allen, Kristine D 580-30763-10064.1 Client Contact: Phone: E-Mail: Tiffany Hill kristine.allen@testamericainc.com Page 1 of 1 Company: Job#: CH2M Hill, Inc. **Analysis Requested** Due Date Requested: Loc: 580 Preser 1100 NE Circle Boulevard Suite 300 80659 A - HCL TAT Requested (days): B - NaC Corvallis C - Zn / State, Zip: Mn. X D - Nitri OR. 97330 E - Nah 59108 - Organic Constituents, UV-Absorbing F - MeC Phone: Σ G - Amc 10006-7-108336 6010C_DOD5 - Dissolved (AI, Ca, Fe, H - Ascorbic Acia 1 - TSP Dodecahydrate Émail: I - Ice U - Acetone tiffany.hill@ch2m.com J - DI Water V - MCAA K - EDTA W - pH 4-5 Project Name: Project #: L - EDA

Other: Z - other (specify) CLEAN CTO-4041 NAS Whidbey Island 58011747 Matrix Sample (W=water, Type S=solid. Sample (C=comp, O=waste/oil, Sample Identification Time G=grab) | BT=Tissue, A=Ai Special Instructions/Note: Preservation Code: W1-A06-RW08-0908 9/27/208 1240 Therm. ID: 12 Cor: 2.5 · Unc: 2.3 · Cooler Dsc: LB
Packing: B-b FedEx: 10 Cust. Seal: Yes_ X No V@Packs/Dry Ice/None Other: Possible Hazard Identification Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For Mont Non-Hazard Flammable Skin Irritant Poison B Unknown Radiological
Deliverable Requested: I, II, III, IV, Other (specify) Archive For Months Special Instructions/QC Requirements: Empty Kit Relinquished by: Gerrit Gardner Gent Horichan TASea Jacon 5 Relinquished by: Company Relinquished by: Company Received by: Company Custody Seals Intact: Custody Seal No.: Cooler Temperature(s) °C and Other Remarks: △ Yes △ No

Page 10f2

Date

Date

Method of Shipment: FedEX



Relinquished by (printed name and signature)

Relinquished by (printed name and signature)

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way

El Dorado Hills, CA 95762

(916) 673-1520 * Fax (916) 673-0106

Invoice to: Name

Project ID: NASWI CLEAN CTO-4041 PO#: 10006-7-108295

Company

CH2M (Jacobs)

CHAIN OF CUSTODY

Address

Time

Add Analysis(es) Requested

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																Page: 1 of 1

Sampler: 6. Gardner

100 NE CIPCLE Blod.

Page 2 of 2



Relinquished by (printed name and signature)

Relinquished by (printed name and signature)

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way

> El Dorado Hills, CA 95762 (916) 673-1520 * Fax (916) 673-0106

> > 9/27/18

1240

0914 0909

Company

Project ID:

ATTN:

Wt-A06-FB08-0918

WI-AF-3RW41P-0918

WHAF-3FB41-0918

Special Instructions/Comments:

Invoice to: Name

CHAIN OF CUSTODY

Address

Time

Time

Add Analysis(es) Requested

Container(s)

3/

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma: ___

Date

Method of Shipment:

Tracking No.:

Location/Sample Description

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Matrix Types: AQ = A	Email:	 EF = Effluent, PP = Pulp/	Paper, SD = Sedimen
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			Page: 1 of 1 Page 29 of 31

O = Other:

Container Types: P= HDPE, PJ= HDPE Jar

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



O = Other:

Vista Analytical Laboratory Project ID: Navy (LEAN NASW) A6 (V DW	PO#: 1006-7	-	20				Fitz	csimmons (name)	Storage ID	TA		Standar Rush (s	urcharge may apply) days 7 days S	pecify: 10 da
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THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle 5755 8th Street E. Tacoma, WA 98424 Tel. 253-922-2310 Fax 253-922-5047 www.testamericainc.com

Rush
Short Hold

Chain of Custody Record

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Monitoring Well

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Project Name		С	ontainer:	2x 125mL	4x 125mL		
Location NASWI, Oak Harbon		Prese	ervatives:	≤ 6ºC	≤ 6ºC		
Project Number 695610.05.Fl.							
Project Manager Heather Perry	у		Filtered:		NA -		
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WI-A06-6-S-19-1217	12/11/2017	11:55	Water	X		2	
WI-A06-6-S-19-1217-TOP	12/11/2017	11:55	Water		X	4	
WI-A06-6-S-19P-1217	12/11/2017	11:55	Water	X		2	
WI-A06-6-S-19P-1217-TOP	12/11/2017	11:55	Water		X	4	
WI-A06-6-S-31-1217	12/11/2017	14:10	Water	X		2	
WI-A06-6-S-31-1217-TOP	12/11/2017	14:10	Water		X	4	
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WI-A06-EB08-121217	12/12/2017	10:25	Water	X		2	
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	Signatures	Date/Time	Shipping Details		Special Instructions:
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Sampled by			Method of Shipment: FedEx		
Relinquished by			On Ice: yes / no	Sample Custody	
Received by			Airbill No: 788879280083	and	Barrant Carryta
Relinquished by			Lab Name: Vista Analytical Laboratory	Martha Maier	Report Copy to Heather.Perry@CH2M.com
Received by			Lab Phone: (916) 673-1520		(530) 229-3276 x33276

CH2MHILL	CHAIN OF CUSTODY RECO	RD 12/12/2017 2:46:38 PM	Page	2	OF _	2
	2x 4x					

Project Name	Container	2x 125mL	4x 125mL
Location NASWI, Oak Harbor, Wash		≤ 6ºC	≤ 6ºC
Project Number 695610.05.FI.FS	Preservatives:		
Project Manager Heather Perry	Filtered:	NA	NA
Sample Manager Tiffany Hill	Holding Time:	7	7
(541) 908-3794			
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Relinquished by			On Ice: yes / no	Sample Custody	
Received by			Airbill No: 788879280083	and	
Relinquished by			Lab Name: Vista Analytical Laboratory	Martha Maier	Report Copy to Heather.Perry@CH2M.com
Received by			Lab Phone: (916) 673-1520	Mai tila Maiei	(530) 229-3276 x33276

 CH2MHILL
 CHAIN OF CUSTODY RECORD
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 Page 1 OF 2

CHZIVIHILL						CHAIN OF CUSTODY RECORD 12/6/2017 5:37:43 PM	Page	1 OF <u>2</u>
Project Name Location NASWI, Oak Harbor,	Washingt	С	ontainer:	2x 125mL ≤ 6°C	4x 125mL ≤ 6ºC			
Project Number 695610.05.FI.F	_	Prese	ervatives:	200	200			
Project Manager Heather Perry			Filtered:	NA	NA			
Sample Manager Tiffany Hill		Holdi	ing Time:	7	7			
(541) 908-3794 Task Order Project WHIDBEY ISLAND Turnaround Time 7 Days Shipping Date: 12/6/2017 COC Number: VAL-120617				PFAS (14 analyte list)	PFAS (14 analyte list) TOP		Number of Containers	
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WI-A06-EB01-120517	12/5/2017	8:40	Water	X			2	
WI-A06-EB01-120517-TOP	12/5/2017	8:40	Water		x		4	
WI-A06-EB02-120517	12/5/2017	16:20	Water	X			2	
WI-A06-EB02-120517-TOP	12/5/2017	16:20	Water		X		4	
WI-A06-EFF01-1217	12/5/2017	12:10	Water	X			2	
WI-A06-EFF01-1217-TOP	12/5/2017	12:10	Water		X		4	
WI-A06-EFF01P-1217	12/5/2017	12:10	Water	X			2	
WI-A06-EFF01P-1217-TOP	12/5/2017	12:10	Water		X		4	
WI-A06-INF01-1217	12/5/2017	12:15	Water	X			2	
WI-A06-INF01-1217-TOP	12/5/2017	12:15	Water		X		4	
WI-A06-P-4-1217	12/5/2017	10:50	Water	X			2	
WI-A06-P-4-1217-TOP	12/5/2017	10:50	Water		X		4	

	Signatures	Date/Time	Shipping Details		Special Instructions:
Approved by				ATTN:	
Sampled by			Method of Shipment: FedEx		
Relinquished by			On Ice: yes / no	Sample Custody	
Received by			Airbill No:	and	Beneat Comute
Relinquished by			Lab Name: Vista Analytical Laboratory	Martha Maier	Report Copy to Heather.Perry@CH2M.com
Received by			Lab Phone: (916) 673-1520		(530) 229-3276 x33276

 CH2MHILL
 CHAIN OF CUSTODY RECORD
 12/6/2017 5:37:44 PM
 Page 2
 OF 2

DATE TIME Matrix WI-A06-6-I-03-1217 12/6/2017 10:35 Water X WI-A06-6-I-03-1217-TOP 12/6/2017 10:35 Water X	Maswil, Oak Harbor, Washingt 2x 4x 125mL 125mL	
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WI-A06-6-I-03-1217-TOP 12/6/2017 10:35 Water X		
	-03-1217-TOP 12/6/2017 10:35 Water X	

	Signatures	Date/Time	Shipping Details		Special Instructions:
Approved by			Method of Shipment: FedEx	ATTN:	
Sampled by			•		
Relinquished by			On Ice: yes / no	Sample Custody	
Received by			Airbill No:	and	Benevit Comute
Relinquished by			Lab Name: Vista Analytical Laboratory	Martha Maier	Report Copy to Heather.Perry@CH2M.com
Received by			Lab Phone: (916) 673-1520		(530) 229-3276 x33276

 CH2MHILL
 CHAIN OF CUSTODY RECORD
 12/8/2017 4:08:15 PM
 Page 1 OF 2

CHZIMHILL						CHAIN OF COSTODY RECORD 12/8/2017 4:08:15 PM	Page	1 OF 2
Project Name		С	ontainer:	2x 125mL	4x 125mL			
Location NASWI, Oak Harbor, W	Vashingt	Prose	ervatives:	≤ 6ºC	≤ 6ºC			
Project Number 695610.05.FI.FS	8	ricsc	a vatives.					
Project Manager Heather Perry			Filtered:		NA			
Sample Manager Tiffany Hill		Holdi	ing Time:	7	7			
(541) 908-3794 Task Order Project WHIDBEY ISLAND Turnaround Time 7 Days Shipping Date: 12/8/2017				PFAS (14	PFAS (14 an		Number of	
COC Number: VAL-120817				PFAS (14 analyte list)	PFAS (14 analyte list) TOP		of Containers	
	DATE	TIME	Matrix					COMMENTS
WI-A06-6-S-17-1217 12	2/6/2017	13:05	Water	X			2	
WI-A06-6-S-17-1217-TOP 12	2/6/2017	13:05	Water		X		4	
WI-A06-EB03-120617 12	2/6/2017	15:20	Water	X			2	
WI-A06-EB03-120617-TOP 12	2/6/2017	15:20	Water		X		4	
WI-A06-6-S-07-1217 12	2/7/2017	11:50	Water	X			2	
WI-A06-6-S-07-1217-MS 12	2/7/2017	11:50	Water	X			2	
WI-A06-6-S-07-1217-MS-TOP 1:	2/7/2017	11:50	Water		X		4	
WI-A06-6-S-07-1217-SD 1:	2/7/2017	11:50	Water	X			2	
WI-A06-6-S-07-1217-SD-TOP 1:	2/7/2017	11:50	Water		X		4	
WI-A06-6-S-07-1217-TOP 1:	2/7/2017	11:50	Water		X		4	
WI-A06-6-S-26-1217 1:	2/7/2017	13:40	Water	X			2	
WI-A06-6-S-26-1217-TOP 1:	2/7/2017	13:40	Water		X		4	
WI-A06-EB04-120717 12	2/7/2017	13:50	Water	X			2	
WI-A06-EB04-120717-TOP 12	2/7/2017	13:50	Water		X		4	

	Signatures	Date/Time	Shipping Details		Special Instructions:
Approved by				ATTN:	
Sampled by			Method of Shipment: FedEx		
Relinquished by			On Ice: yes / no	Sample Custody	
Received by			Airbill No:	and	Beneat Comute
Relinquished by			Lab Name: Vista Analytical Laboratory	Martha Maier	Report Copy to Heather.Perry@CH2M.com
Received by			Lab Phone: (916) 673-1520		(530) 229-3276 x33276

 CH2MHILL
 CHAIN OF CUSTODY RECORD
 12/8/2017 4:08:15 PM
 Page 2
 OF 2

CHZIVINILL						CHAIN OF COSTOD FILECORD 12/6/2017 4.06.15 PW	raye	<u> </u>
Project Name Location NASWI, Oak Harbo	or, Washingt	С	ontainer:	2x 125mL ≤ 6ºC	4x 125mL ≤ 6ºC			
Project Number 695610.05.F		Prese	ervatives:					
Project Manager Heather Per			Filtered:	NA	NA			
Sample Manager Tiffany Hill		Holdi	ing Time:	7	7			
(541) 908-37 Task Order Project WHIDBEY ISLAND Turnaround Time 7 Days Shipping Date: 12/8/2017 COC Number: VAL-120817	794			PFAS (14 analyte list)	PFAS (14 analyte list) TOP		Number of Containers	
	DATE	TIME	Matrix				S	COMMENTS
WI-A06-EB05-120717	12/7/2017	14:30	Water	X			2	
WI-A06-EB05-120717-TOP	12/7/2017	14:30	Water		X		4	
WI-A06-FB01-120717	12/7/2017	14:45	Water	X			2	
WI-A06-FB01-120717-TOP	12/7/2017	14:45	Water		X		4	
WI-A06-MW-10-1217	12/7/2017	9:45	Water	X			2	
WI-A06-MW-10-1217-TOP	12/7/2017	9:45	Water		X		4	
WI-A06-6-S-14-1217	12/8/2017	13:10	Water	X			2	
WI-A06-6-S-14-1217-TOP	12/8/2017	13:10	Water		X		4	
WI-A06-6-S-44-1217	12/8/2017	10:50	Water	X			2	
WI-A06-6-S-44-1217-TOP	12/8/2017	10:50	Water		х		4	
WI-A06-EB06-120817	12/8/2017	14:00	Water	X			2	
WI-A06-EB06-120817-TOP	12/8/2017	14:00	Water		х		4	
	1					TOTAL NUMBER OF CONTAINERS	78	

	Signatures	Date/Time	Shipping Details		Special Instructions:
Approved by				ATTN:	
Sampled by			Method of Shipment: FedEx		
Relinquished by			On Ice: yes / no	Sample Custody	
Received by			Airbill No:	and	Beneat Comute
Relinquished by			Lab Name: Vista Analytical Laboratory	Martha Maier	Report Copy to Heather.Perry@CH2M.com
Received by			Lab Phone: (916) 673-1520		(530) 229-3276 x33276

TestAmerica Seattle

5755 8th Street East

Chain of Custody Record

TestAn	nerica
That I have been a second	Color and a second color and a second as a color

Client Contact				7/		10:	to C^	ntan	: David Butler	ID-1 2/22/2010	COC No: AREA6_TA_201802		
CH2M		530) 229-3	eather Peri	у					: Kris Allen	Date: 2/22/2018 Carrier: Fed Ex			
1100 112th Ave NE Suite 500	·····		urnaround	Time		1-4	T	inaci	. Kris Alleli	Carrier: Fed Ex			
Bellevue, WA 98004	CALEND		~~~	KING DAY	S	-					Sampler: David Butler For Lab Use Only:		
(425) 453-5005 Phone		T if different f			-	1	$ \widehat{z} $				Walk-in Client:		
425-468-3100 FAX			weeks			Z	>				Lab Sampling:		
Project Name: NASWI		1	week			7		į					
Site: Area 6 Off-base		2	days			<u>š</u>	Σ				Job / SDG No.:		
O # 695610.05.FI.FS		1 :	day			ä	<u>[2</u>						
			Sample			S	έla	Σ		50427			
	Sample	Sample	Type (C=Comp,		# of	Filtered	취용	8		18			
Sample Identification	Date	Time	G=Grab)	Matrix	Cont.	這	Perform MS / MSD (Y / N)	82	— Therm ID	2 Corto Unc 1.70	Sample Specific Notes:		
TripBlank	2/19/2018	07:00	G	w	2		NX		Cooler Dsc:				
Wi-A06-EB01-021918	2/19/2018	16:45	G	w	5				Wet/Packs I				
WI-A06-MW-13-0218	2/20/2018	11:10	G	w	5	1-1				Custody Seal: Yes <u>≮</u> No			
WI-A06-MW-13-0218-MS	2/20/2018	11:10	G	w	2	N		х		10 11 11	MC/MCD on 9270CIM and		
Wi-A06-MW-13-0218-MSD	2/20/2018	11:10	G	w	2	N	Y	X	Therm. $ID_{\underline{}}^{}$	2 Cor 1.1 ° Unc 2.6 °	MS/MSD on 8270SIM only		
WI-A06-RW17-0218	2/20/2018	13:40	G	w	5	1	NX		Cooler Dsc:	La GyrBlue Packing: bub	MS/MSD on 8270SIM only		
WI-A06-RW17P-0218	2/20/2018	13:45	G	w	5	11	N X		weiracks	Custody Seal: Yes No			
WI-A06-6-DW-38A-0218	2/20/2018	14:55	G.	w	5	7	N X			•			
WI-A06-6-S-27-0218	2/21/2018	41.45	G G		5		1			DAZ ConO.l · Uncl. O ·			
WI-A06-6-S-28-0218	2/24/2048	11.15		W	5		NX		Cooler D	sche Green			
	2/21/2018	15:00	G	W	5		NX		Wet/Pack	scly Green s Packing: Brp			
WI-A06-FB01-022118	2/21/2018	45.40	G	W	5	 	NX		+ FPO	Custody Seal: Yes ≺No			
WI-A06-MW-01-0218 reservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; {	2/21/2018 =NaOH: 6= O		G j	w	5	N	NX	X					
ossible Hazard Identification:							Samo	le Di	sposal (A fee may be	assessed if samples are retain	ed longer than 1 month)		
re any samples from a listed EPA Hazardous Waste? Please	List any EPA	Waste Cod	tes for the s	ample in	n the					accessed it damples are retain	ed longer than I month,		
omments Section if the lab is to dispose of the sample.			<u> </u>			_							
	Poison B	Hany Wille	Unknow	n bill@			□R	eturn	o Client ''Dis	posal by Lab Archive for	Months		
South mode designed requirements a comments.	a results to 11	itassy riii/C	SUSTAN (ALLS)	നഴ.ങ്ങള	GNZM.	com	1)						
Custodia Carlo Interet	Ta												
Custody Seals Intact: Yes No	Custody Se		T.	n / m:					Cooler Temp. (°C): Ob		Therm ID No.:		
Eric Cantle	Company:	CHZN	1 [Date/Tin ごむ	ne: IX D&	٠ ,	CU	ed bر المرجع	Vds	Company:	2:23:18 0955		
elinquished by:	180 3 9 10 4 8 10 11 9 9 10 10 10 10 10 10 10 10 10 10 10 10 10			⁻te/Tin			ecei			Company:	Date/Time:		
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580-75281 Chain of Custody

TestAmerica Seattle

5755 8th Street East

Chain of Custody Record

TestAme	rica
THE LEADER IN ENVIRONMENT	STAR TROPING

Tacoma, WA 98424-1317 phone 253.922.2310 fax 253.922.5047 Regulatory Program:

Dw **NPDES** RCRA Other: TestAmerica Laboratories, Inc. **Client Contact** Project Manager: Heather Perry Site Contact: David Butler Date: 2/22/2018 COC No: AREA6_TA_20180222 CH2M Tel/Fax: (530) 229-3276 Lab Contact: Kris Allen Carrier: Fed Ex of Pages 1100 112th Ave NE Suite 500 **Analysis Turnaround Time** Sampler: David Butler Bellevue, WA 98004 CALENDAR DAYS WORKING DAYS For Lab Use Only: z (425) 453-5005 Phone TAT if different from Below Walk-in Client: 425-468-3100 FAX Perform MS / MSD (Y / Sample (Y/N) 2 weeks Lab Sampling: Project Name: NASWI 1 week Site: Area 6 Off-base 2 days Job / SDG No.: P O # 695610.05.Fl.FS Sample Type Sample Sample # of (C≖Comp, Sample Identification Date Time G=Grab) Matrix Cont. Sample Specific Notes: 16:50 5 WI-A06-EB01-022118 2/21/2018 Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Possible Hazard Identification: Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample. ☑ Non-Hazard Flammable Skin Irritant Poison B Unknown Return to Client Disnosal by Lab Archive for Months Special Instructions/QC Requirements & Comments: Send results to Tiffany Hill/CH2M (tiffany.hill@ch2m.com) Custody Seals Intact: ☐ No Custody Seal No.: Cooler Temp. (°C): Obs'd: Corr'd: Therm ID No.: Relinguished by: Company Date/Time: Received by 2-62-13 034: Relinquished by: Company: Date/Time: Received by: Company: Date/Time: Relinquished by: Company: Date/Time: Received in Laboratory by: Company: Date/Time:



CHAIN OF CUSTODY

For Lai	boratory Use der #:	Only 0201		p: 0.0	/
Storage	ID:W	R-2		p: Secured: Yes	No □
	TAT (check one		d: 21 durcharge may applicately days 7 day	oly)	
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Project ID: NA3WI	Area	a 6	PO#: 695610,	05:	FI,	F5	_San	npler:]	Davi	d Butler	(chec	k one): Rush	(surcharge may apply)	
Invoice to: Name		Compan	у	_	Addı	ess					City	State	14 days Ph#	Specify:
Heather Perry	(HZM	2525	A	irpo	irk	Dr	ive		Reddin		CA	530-229-322	
Relinquished by (printed nam	e and signat	ure)	Date		Time				ved by	(printed name and signature			Date	Time
ENZ Cutt			2-22-13	0	290	^	1	B.B.	ine	dut Better	gnede	it	02/22/18	0939
Relinquished by (printed name		ure)	Date		Time					(printed name and signature			Date	Time
SHIP TO: Vista Analytical L 1104 Windfield V El Dorado Hills, ((916) 673-1520 *	Vay CA 95762 Fax (916) 6		Method of Shipment: Fed Ex Tracking No.:		Cont	sis(es)	s)	/	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	//3	ON MONEY ST.	/	
Sample ID	Date	Time	Location/Sample Description	3	The St.	The Mark	* / 2	2 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	23/1/8/1/25/25/25/25/25/25/25/25/25/25/25/25/25/		2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Commen	ts
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J-A06-MW-13-0218	2/20/18	1110		2	P	AQ			X					
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Special Instructions/Comments:	362	-						-			City: Corv	12M 20 NE allis -766-310) 9 Fax:	Zip: <u>97330</u>
Container Types: P= HDPE, P. O = Other:	J= HDPE Jar		Bottle Preserva TZ = Trizma:		/pe: T	= Thio	sulfat	- - :e,	- 5 8	Matrix Types: AQ = Aqueou SL = Sludge, SO = Soil, WW	Email: + i-	Fanysh g Water, EF = E	Fax: Ch2miC	iom



CHAIN OF CUSTODY

Storage ID):	W	K.2		Temp:	cured: Yes No [
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Analytical Labor	atory					5 01					Storag	e ID: _	W	K.2		Storage Secu	red: Yes 🗹 No 🗆
Project ID: NASWI A	Area 6		PO#: <u>645610.0</u>	5.1			Sample	r: <u>Do</u>	wid	Butler (name)			AT neck one):		urcharge	21 days may apply) 7 days	
Invoice to: Name		Compan	*	100		ress				11	City		1760	State	Ph	#	Fax#
Heather Perry		CHIA	1 2525	A	inp.	ark D	rive	2		Reddi	na		CA	5	30-22	9-327	6
Relinquished by (printed name	and signat	ture)	Date		Tim	е	Re	ceived	by (pr	inted name and signat			1/21			Date	Time
Fric Cutton			2-22-18		09	in a	12	134	inor	Will by Lk	1/2	n,	det		02/2	2/10	0940
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SHIP TO: Vista Analytical La 1104 Windfield Wa El Dorado Hills, C/ (916) 673-1520 * F ATTN: Sample Re	ay A 95762 Fax (916) 6		Method of Shipment: Fed EX Tracking No.:		Con	sis(es) Retainer(s)			14 No.	0,000,000,000,000,000,000,000,000,000,	/5	//	14 (50 A 14 A) 15 (50 A) 14 (40 A) 15 (50 A) 14 (40 A) 15 (50 A) 14 (40 A) 15 (50 A) 1	mu			
Sample ID	Date	Time	Location/Sample Description	3	Tillus 12	od timen		10 P	F1 (58; 74)	74 MOS 60 MOS 10	P. 64/P.	Samo !				Commer	ato.
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	2/20/18	1700		2	P	AQ		X				+	†	9.8			
A06-6-5-27-0218	2/21/18	1115		2	P	AQ		X				-	†				· · · · · · · · · · · · · · · · · · ·
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A 06-EBO1-022118	2/21/18	1650		2	P	AQ		X									
Special Instructions/Comments:	0030	67						.1		SEND CUMENTATION RESULTS TO:	Compa Addre C Pho	ny: ss: <u>} </u>	ittan CHZM OO VE Fralli 11-768-	1' Circli	State	OR	300 Zip: 97330
Container Types: P= HDPE, PJ= O = Other:	HDPE Jar		Bottle Preserva TZ = Trizma:	13-	ype: T	= Thiosu	ulfate,			latrix Types: AQ = Aqu L = Sludge, SO = Soil, V	ieous, DV	V = Drir	nking Water,	EF = Efflu	ient, PP = I		

Loc: 580 **75202**

TestAmerica Seattle

5755 8th Street East Tacoma, WA 98424

Chain of Custody Record

TestAmerico

Phone (253) 922-2310 Fax (253) 922-5047				_														THE LEADER IN	Environmental Testi	関節 HG
Client Information	Sampler:	Urich			ab PM: Allen I	(ristine	. n					T	Camer T	acking	No(s):			GOC No:		
Client Contact: Tiffany Hill	Phone:				-Mail;							\dashv						Page:		_
Company: CH2M Hill, Inc.				!!	ristine	.allen@	Qtesta	meni	cainc	.com								Page 1 of1 Job#:		_
Address:	Due Date Reques	teri-			_	i de la compania			Д	naly	sls i	₹equ	este	d				J		Ě
1100 NE Circle Boulevard Suite 300 City:															ONLY	,	Section 1	Preservation C	odes:	
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Emeli;	10006-7-10833	6													5	\(\leq		G - Amchior H - Ascorbic Acid	S - H2SO4 T - TSP Dodecahydrat	
tiffany.hill@ch2m.com	WO#:				8							Ì	¥		Ó	S		I-loe	U - Acetone V - MCAA	
Project Name: CLEAN CTO-4041 NAS Whidbey Island	Project #: 58011747			****** <u>**</u>	3				_				80 88		260	MISOLZA	ě	K-EDTA L-EDA	W - pH 4-5	
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			Sample Type	Matrix (*******	1103	1	8250C Volgelles	Semivofatil	otai	9034 - Sulfide,	Corre	det	ofatik		VOCS	2	Ę			
Commis the stiff with an		Sample	(C≡comp,	5=eolid, O=wanta/o		Pasterra St. Motels - Soil) S	8270D S	2A T	. S	29	8	B260C Vo		9	SVOC	Ž			
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Possible Hazard Identification		¥		·																7 X
Non-Hazard Flammable Skin Irritant Pol			~ "			Sampl	e Dis _i	posal	I{A	fee m	ay be	858	55 ed	if san	ples	are re	tain	l ed longer than 1 ive For	month)	
Deliverable Requested: I, II, III, IV, Other (specify)	son B Unkni	own - F	<i>Kadiologica</i>	<u> </u>		Special	Returi	1 To (Ciient nei Ot	Roc	LUI COM	Disp	osai E	y Lab		لــــا	Arch	ive For	Months	
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elinguished by:	Date/T						d b	y:							ate/Tir	ne:			Campany	-
Custody Seals Intact: Custody Seal No.:	┷╼-						em	peratu	ire(s) '	C and	Other I	temes	ks:						<u> </u>	-
Δ Yes Δ No						of 62														
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CHAIN OF CUSTODY

Vista Analytical Labore	atory		СНА	IN OF	С	US	ТО	DY			For Wo Sto	r Labo rk Orde rage ID:	ratory Use C #: \begin{align*} \begi	339	s	_ Temp: _ torage Secu	2.5	<u>°C</u> No □
Project ID: 695616.1		, FS)-4D4		dress	_Sam	pler: <u>)</u>	. L	UviCh (name)			TAT (check one):	14 (ircharge m	7 days	specify: \(DA
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Relinquished by (printed name a	and signatu	ıre)	D	ate	Tim	ne		Received	d by (p	orinted name and	signature)					Date	Time	
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Special Instructions/Comments:										SEND DCUMENTATION ID RESULTS TO:	Com Ad	dress: City:		N ECIRCI 115 6:3100	LE BLI State:] Fax:	OP.	5.300 Zip:_973:	
Container Types: P= HDPE, PJ= O = Other:	HDPE Jar			Preservation Trizma:	Туре:	T = Thi	iosulfate	э,		Matrix Types: AC			₩.			ulp/Paper,	SD = Sedimer	ıt,

TestAmerica Seattle

Chain of Custody Record

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5755 8th Street East

Tacoma, WA 98424-1317

75341

THE LEADER IN ENVIRONMENTAL TESTING

phone 253.922.2310 fax 253.922.5047	Regu	Regulatory Program: DDW DNPDES DRCRA DOther:													TestAmerica Laboratories, Inc.								
Client Contact	Project N	Site	Site Contact: Eric Cutler								2-26-	2018				COC No:							
CH2M Hill Inc.	Tel/Fax: Lab Contact: Kris Allen Car								Carrie	rier:2_ of2 COCs													
1100 112th Ave NE, Suite 500	4	П	Ę	, in												Sampler:							
Bellevue, WA 98004	□ CALEND	☑ CALENDAR DAYS ☐ WORKING DAYS									-			İ] [For Lab Use Or	ily:		
(425) 453-5000 Phone		TAT if different from Below _10 days									l					İ				Walk-in Client:			
FAX	D D	2	<u> </u>	5						İ					ļ	Lab Sampling:							
Project Name: CLEAN CTO-4041 NAS Whidbey Island	Ø		֓֞֞֞֞֞֓֞֓֓֞֞֞֞֓֓֓֓֞֞֞֞֓֓֓֡֓֞֡֓֡֡֡֡֡֡	vinył chloride	`								ĺ		İ								
Site: Area 6 off-Base Groundwater		2 d	lays			읦	ĘĮĔ	₩.]		Job / SDG No.:			
P O # 10006-7-108336		10	lay Sample		,	ĮĔĮ:	2 2	021								ĺ							
Sample Identification	Sample Date	Sample Time	Type (C=Comp, G∞Grab)	Matrix	# of Cont.	Filtered (Perform MS / MSD (Y/N) SVOC (8270SIM): 1-4 dioxane only	VOC (82602IM):	,											Sample S	pecific Notes:		
-1 WI-A06-EB01-022218	2/22/2018	1550	G	w	3	ΝJ	N	3															
WI-A06-MW03B-0218	2/22/2018	1500	G	w	3	N	N	3															
⁻ 3 WI-A06-EB01-022318	2/23/2018	1500	G	w	3	ΝI	N	3															
WI-A06-6-S-02-0218	2/23/2018	1355	G	w	3	N I	N	3			_												
- 5 WI-A06-6-S-05-0218	2/23/2018	1035	G	w	3	N	N	3															
WI-A06-6-S-05P-0218	2/23/2018	1035	G	w	5	ΝI	N 2	3					_				_						
Trip Blank	2/22/2018	0700	G	W	2	ΝI	<u> </u>	2					_	-			-						
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																80-7	5341	Cna	11 01 0	Custody			
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5	=NaOH; 6=	Other	2																				
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please Comments Section if the lab is to dispose of the sample.	List any EP	A Waste C	odes for th	e sampl	e in the		amp	ile D	Dispo	sal (A fee	may	/ be :	asses	sed i	f san	nples	are	retain	ned longer than 1	month)		
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant		□ Poison B □ Unknown						☐ Return to Client ☐ Disp									ΘA	rchive	for	Months			
Special Instructions/QC Requirements & Comments:									•														
Custody Seals Intact: D Yes D No	Custody S	eal No.:	*******		···········	'			Cool	ler Te	mp. ((°C):	Obs	d:Corr'd;						Therm ID No.:			
Relinquished by: Eric Cutler	Company:	CH2M		Date/Tir 18, 113		6- R	Recei	ved	by:											Date/Time:			
Relinquished by:	Company:			Date/Tir		R	lecei	ved	by:				· · · · · · · · · · · · · · · · · · ·		Com	pany:	<u>.</u>			Date/Time:			
Relinquished by:	Company:			Date/Tir	ne:	R	lecei	y g	in Lea	Dórat	gry by	y:			Com	pany:	7)=	1		Date/Time:	0923	7	

TestAmerica Seattle

Chain of Custody Record

TestAmerica

5755 8th Street East

THE LEADER IN ENVIRONMENTAL TESTING

75341 Tacoma, WA 98424-1317 phone 253.922.2310 fax 253.922.5047 Regulatory Program: DDW TestAmerica Laboratories, Inc. O NPDES O RCRA O Other: Client Contact Project Manager: Tiffany Hill Site Contact: Eric Cutler Date: 2-26-2018 COC No: CH2M Hill Inc. Tel/Fax: Lab Contact: Kris Allen Carrier: COCs 1 of 2 1100 112th Ave NE, Suite 500 **Analysis Turnaround Time** Sampler: Bellevue, WA 98004 CALENDAR DAYS □ WORKING DAYS For Lab Use Only: dioxane (425) 453-5000 Phone Walk-in Client: TAT if different from Below _10 days FAX 2 weeks Lab Sampling: Project Name: CLEAN CTO-4041 NAS Whidbey Island Ø 1 week Site: Area 6 off-Base Groundwater 2 days Job / SDG No.: P O # 10006-7-108336 B 1 day Sample Type Sample Sample # of (C=Comp, G≈Grab) Sample Identification Date Time Matrix Cont. Sample Specific Notes: - [NINI 2 WI-A06-EB01-022218 2/22/2018 1550 G W 2 WI-A06-MW03B-0218 2/22/2018 1500 G W 2 N N 2 - 3 WI-A06-EB01-022318 2/23/2018 1500 G W 2 N N 2 Therm. ID M Cor 3.40 Unc 4.50
Cooler Dsc: L+5 & Ive
Wet/Packs Packing: Bus by WI-A06-6-S-02-0218 2/23/2018 1355 G W 2 N 2 -5 N N 2 WI-A06-6-S-05-0218 2/23/2018 1035 G W Tal 1.6 Custody Seal: Yes No_ Therm. ID M2 Cor 1.10 Unc 4.00
Cooler Dsc: Los Bloc
Wei Packs Packing: Tello Custody Seal: Yesk No_ Preservation Used: 1=1ce, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other Possible Hazard Identification: Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample. ☐ Skin Irritant □ Poison B □ Unknown □ Flammable □ Return to Client Disposal by Lab ☐ Archive for Special Instructions/QC Requirements & Comments: Cooler Temp. (°C): Obs'd: Corr'd: Therm ID No .: Custody Seals Intact: □ Yes □ No Custody Seal No.: Relinquished by: Eric Cutler Company: CH2M Date/Time: 2-26- Received by: Date/Time: Company: 18, 1130 Relinquished by: Company: Date/Time: Received by: Company: Date/Time: Date/Time: Relinquished by: Date/Time: Company: Received in Laboratory by: Company:

2/27/18

Submit by Email*



FOR LABORATORY USE ONLY Laboratory Project ID: 1806

5367	Temp 3.2
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Storage ID	WK-2
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Storage Secured:
Yes V No ...

CHAIN OF CUSTODY RECORD

Project I.D.: Invoice to: P. Relinquishe	1295611	1000	Comp CH	P.O. #:		ress	· Ac	re!	Ste S	OD Bere	ity	le vi	er ew	d Prijsted	nganeig B.B	late V+	zi 91 edi	004	Stan Rust O Ph#	dard (sure (4 day	charge ys (&70 F -939	ys apply) days Sp	ŝ √i	na ew
				See "Sam	ple Log-in C	hec	klis	t" fo	or a	ddit	onal	san	ıple	info	rmat	ion									
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ATTN:	(213) 313			Tracking N	o.:		/.	taine	Ź,		, S. S.		7 /8										//	/	
Sa	mple ID	Date	Time	Location/Sample	Description	\d	Martic	18/1	eiro?	3	18/				/\$	/3	13)	13/			<u> Zi</u>	<u>Z</u>	_		
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Work Order 1800367 Page 21 of 24

<u>TestAmerica</u>

TestAmerica Seattle 5755 8th Street E. Tacoma, WA 98424 Tel. 253-922-2310 Fax 253-922-5047

Rush	AND RESIDENCE OF THE PROPERTY OF
1	Chain of
Short Hold	Custody Record

THE LEADER IN ENVIRONMENTAL TESTING		Fax 253- www.tes			.com					L					`	Jus	louy m	,001 a	
Client a cobs (CH2M Hill) Address		1	Contact) m	y Hil ea Code)/Fa	ax Nun	nher			~			Date 7 2 ab Num	_		Ci	hain of Custody	Number 37684	1
1100 NE Circle Blvd. State Zi	.300	(5	41)0	108	7-370	14				ax to) KOE					Pa	age	of 2	_
City State Zing CR Project Name and Location (State)	7330	K.	Per Contact	ardr	ler f	ab Col	ntact 5 Al	len		SOUCE DODEWOLD	8260 SIAL VINY CHIMOCOL	more s	sis (Atta space is	ch list if needed)					_
CLEAN CTO-4041 NAS L Contract/Purchase Order/Quote No.	Midbey Is						Contain	ara 9			viny	PDiox					1,50	I Instructions/ ons of Receipt	
10006-7-108336				Matrix			Contain Preserv				SIM	M15 0Z					Conunt	uns ur neceipt	
Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Air Aqueous	Sed.	Soil	H2S04	HN03 HCI	NaOH 7242/	NaOH	300	8260	8270							
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WI - A06 - 6-5-41-0718	7 18 18	1350	X		>	_	X				8						ζ.ε	11	_
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W1 - A06-6-5-42P-0718	7/19/18	0955	X)	<	X				X	<					11	()	_
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W1-A06-6-5-43-0718-MS	7/19/18	1410	X		>	`	X					<					(1	((_
W1-A06-6-5-43-0718-MSD	7/19/18	1410	X		>	4	X				Y.	X					6	((
Trip Blank O)	7/16/18	1200	X				X				X						W	11	_
X Yes □ No Cooler Temp: □ Non-Ha	lazard Identification azard 🔲 Flan		☐ Skin Iri	ritant	☐ Pois					nple Dispo Return To			isposal E chive Fo		Moi			assessed if samples nger than 1 month)	
Turn Around Time Required (business days) 24 Hours 48 Hours 5 Days 10 Days	ays 🗆 15 Days	s 🖾 Oth	er _ 7	day	S	QC	Requirem	ents (S	pecify)										
1. Relinquished By Sign/Print Gerrit Grandner		Date	0)18	Time	000	1. F	Received E	By Sign	n/Prin	t						[Date	Time	4
2. Relinquished By Sign/Print		Date		Time	9	2. Fi	Received E	y Sign	n/Prin	t							Date	Time	il .
3. Relinquished By Sign/Print		Date		Time	9	3. Fi	Received E	y Sign	ı/Prini)ate	Time	

Comments

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THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle 5755 8th Street E. Tacoma, WA 98424 Tel. 253-922-2310 Fax 253-922-5047 www.testamericainc.com

	Chain of
Short Hold	Custody Record

Rush

Client Jacobs (CH2M HILL)	Jacobs (CH2M HILL)							u I	Hill										Date 7	201	18			Chain of Custody Number 376					7685
Address	C >	200	Teleph		Vumbe	r (Ar	ea Co	de)/F	ax Nui	mber								1	Lab No	ımber									
1100 NE Circle Blvd.					90										1 = 3									Pa	ge_			of	2
City	State	Zip Code	Sampl					1	Lab Co						chlorida	3		Analy more	'sis (Al space	is nee	ist if eded)								
Project Name and Location (State)	OR	97330	Billing		Rer	nyn	en		KY	1.2	AII	en			0	1,4-dioxanl													
	s Whid	lbey Island	Dining	COIIL	асі										Vinyl	- · · ·				ł						Speci	al Inc	truc	tions/
Contract/Purchase Order/Quote No.		- TSTATION		Т				Т		Co	ntain	are &		-		1	ļ									Condi			
10006-7-108336					M	atrix	(eserv				M	Z		-										0, ,,,	,00,01
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Cooler	Possib	ole Hazard Identification	1	<u></u>				-					1	San	iple D	isposa			Dispos	sal By	Lab				(A fo	o may h	a 2000	eed i	f samples
🔀 Yes 🗆 No Cooler Temp:	□ No	n-Hazard 🗆 Flar	mmable [$\supset s$	kin Irri	tant		□ Po	ison B			Inkno	wn		Returr	To C	lient		Archiv				Mor	nths					1 month)
Turn Around Time Required (business days)									I Q	C Red	quirei	nents	(Spe	cify)														a 6015	1000
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Comments															-														



Relinquished by (printed name and signature)

Relinquished by (printed name and signature)

SHIP TO: Vista Analytical Laboratory

WI - A06-FBC1-071718 7/17/18

WI-A06-EROZ-071718 7/17/18

WI- A06-EB03-071718 71718

Sample ID All A6-5 6713 WI - A06 - FBC1 - 0718

W1-A06-3-0718

W1-A06-S-11-0718

NI-A06-6-5-40-0718

WI-A06-FB02-071818

W1-A06-EB01-071718

Special Instructions/Comments:

O = Other:

1104 Windfield Way

El Dorado Hills, CA 95762

Martha Maier

(916) 673-1520 * Fax (916) 673-0106

7/17/18 1735

7/17/18

7/18/18

7/18/18

7/17/18

1735

1735

1017

1017

1715

1725

1830

Invoice to: Name

CHAIN OF CUSTODY

Address

Time

Time

09.00

Add Analysis(es) Requested

Container(s)

P 2

P

P

2 12

2 P AG

2 P AQ

AQ

AG

AQ

AQ

Project ID: NASW Area 6 (TO: 4041 PO#: 101000479 Sampler: Gerrit Gardner

Method of Shipment:

FedEX

Tracking No.:

6-5-11

6-5-40

tubing

pump

bladder

Location/Sample Description

Date

Date

Company

Jacobs

For Laboratory Use Only Work Order #:			
Work Order #:	100000		
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Storage ID:	Storage Secured:	Yes No	
TAT Standard:			
pler: Gerrit Gardner (check one): Rush (surcharge	e may apply)		
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AND RESULTS TO:	tate: Z	ip:	_
	Fax:		_
Fmail:			

Container Types:	P= HDPE,	PJ= HDPE Jar
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Bottle Preservati	on Type:	T	=	Thiosulfate,
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Page 2 Of 2



Relinquished by (printed name and signature)

Relinquished by (printed name and signature)

SHIP TO: Vista Analytical Laboratory

1104 Windfield Way

El Dorado Hills, CA 95762 (916) 673-1520 * Fax (916) 673-0106

Date

7/18/18

7/18/18

7/19/18

7/19/18

7/19/18/0945

7 19 18 0955

Time

1550

1350

0455

1615

1405

1410

Project ID:

Invoice to: Name

ATTN:

Sample ID

W1-A06-EB04-071818

WI-A06-6-5-41-0718

W1 A66 6-5-42-0718

W1- A06-6-5-42-0718

WI-A06-6-5-42P-0718

WI- A06-EB05-071918

W1-A06-6-5-43-0718-

WI-A06-FB03-071918 7 1918

WI-A06-6-5-43-0718-MS 7/19/18

See P.

Company

CHAIN OF CUSTODY

Address

Time

Time

Add Analysis(es) Requested

Container(s)

AQ

AQ

AC

AQ

AQ

AQ

2

6 P AQ

6

2 P

2 P

P

P

Date

Date

Method of Shipment:

Tracking No.:

Location/Sample Description

6-5-42 duplicate

Dump

6-5-41 4

6-5-47

6-5-42

pump

6-5-43

6-5-43

			For Labo	ratory (Use Only		Ì
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וטו			Storage ID):		Storage Secure	ed: Yes 🗌 No 🗌
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6 P 6-5-43 7/19/18/1410 WI-A06-6-5-43-0718-MSD Special Instructions/Comments: SEND DOCUMENTATION AND RESULTS TO: Phone: Email: Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,

Container Types: P= HDPE, PJ= HDPE Jar

O = Other:

Bottle Preservation Type: T = Thiosulfate,

TZ = Trizma:

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

Loc: 580

80030

TestAmerica Seattle

5755 8th Street East

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

CTO 4041

Tacoma, WA 98424-1317 phone 253.922.2310 fax 253.922.5047	Regu	latory Pro	ogram: [Dw [NPDES	ĺ	⊟RCI	RA		Other:										TestAn	nerica	a Labo	ratori	es Inc
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Preservation Used: 1= Ice, 2= HCI; 3= H2SO4; 4=HNO3; 5=I	laOH; 6= 0	ther		1,54 N. N.	10 10 100	N .	_	1	<u> </u>			åV V						1	1.5		eki jir	12/21/	126 291	
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please L Comments Section if the lab is to dispose of the sample.	st any EPA	Waste Co	des for the	sample i	n the	s	amp	ole D	ispo	sal (/	A fee n	nay be	ass	esse	d if s	ampl	es ar	e reta	ained	longer th	ian 1 i	month)		
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Custody Seals Intact:	Custody Se	al No.:									mp. (⁰(C): Ob:	s'd:_			Corr	d:		 -	Therm ID	No.:			
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CHAIN OF CUSTODY

For Laboratory Use Only		10	
Work Order #: 1004644	Temp:	100	°C
Storage ID: WR-2	Storage Secured:	Yes 🗹	No 🗌

Project ID: Navy CLEAN NASM Invoice to: Name	AG OFF-	Buse G		-108		ress	Samp	ler:	Krys	tle.	Remmer (name)	City	TAT (check o		rcharge may apply)	pecify: 10 days
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SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: (2 (916) 673-0		Method of Shipment: Fed Ex Tracking No.:		Cont	sis(es) F	7/	7	\$, will 60%	P. A. S. C. C. C. C. C. C. C. C. C. C. C. C. C.		/ %	\$ 194 S		
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Special Instructions/Comments:														-		
agreement in the determination of the second in the determination of the second in the										OCUN	SEND MENTATION ESULTS TO:	Address: City:			State: Z	ip:
Container Types: P= HDPE, PJ= HDPE Ja	ar		Bottle Preservation Type	: T = TI	hiosul	fate,					AQ = Aqueous, DV		ater, EF =	Effluent, PP = Pu	lp/Paper, SD = Sedimer	nt,



TestAmerica Seattle 5755 8th Street E. Tacoma, WA 98424 Tel. 253-922-2310 Fax 253-922-5047 www.testamericainc.com

 Short Hold	
SHOLLHOLD	

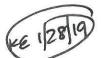
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Chain of Custody Record

Jacobs (CH2M Hill)			t Conta	1 - 64	79	14	11						***************************************			Date	/:	24,	/2	019	1	Ch	ain oi	Custo	dy Nu		508	 }
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100067-108336				Ma	atrix				reserv															Coma	i Li Ui i:	<i>5</i>	ισυιρι	
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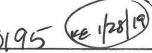
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SHIP TO: Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: (9	916) 673-01	106	Method of Shipment: Fed E-X	Add	SAINCE PROPERTY	vsis(es)	00071200380	uested	_	/		1800 00 00 00 00 00 00 00 00 00 00 00 00			/				
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P.Dof2

Company



(name)





Project ID:

Invoice to: Name

CHAIN OF CUSTODY

Address

TAT Standard: 21 days (check one): Rush (surcharge may apply) 14 days 7 days Specify:	Work Order #	ory Use Only	185	Temp:	1.2
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	915
Relinquished by (printed name and signature) Date // Time Received by (printed name and signature) Date // Time	me
SHIP TO: Vista Analytical Laboratory	White spinetes and
El Dorado Hills, CA 95762 Ph: (916) 673-1520; Fax: (916) 673-0106 Method of Shipment: Container(s)	
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ATTN: Tracking No.:	
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WI-ACG-AQC2-C119 1330 WW	
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Special Instructions/Comments: Name: SEND	
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City: State: Zip:	
Phone: Fax:	
Email: Container Types: P= HDPE, PJ= HDPE Jar Bottle Preservation Type: T = Thiosulfate, Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,	

Container Types: P= HDPE, PJ= HDPE Jar

TZ = Trizma:

O = Other:

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

Attachment 4
Raw Data and Data Validation Forms for
Groundwater Monitoring Well and
GETR Samples



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1701943

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-6-S-04-1217	1701943-01	Water
3	WI-A06-6-S-19-1217	1701943-03	Water
5	WI-A06-6-S-19P-1217	1701943-05	Water
7	WI-A06-6-S-31-1217	1701943-07	Water
9	WI-A06-EB07-121117	1701943-09	Water
11	WI-A06-6-S-08-1217	1701943-11	Water
13	WI-A06-EB08-121217	1701943-13	Water

A full data validation was performed on the analytical data for five water samples and two aqueous equipment blank samples collected on December 11-12, 2017 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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

- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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.

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB07-121117	None - ND	- 6′ -		2
WI-A06-EB08-121217	None - ND)+i	(4)	¥

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate %R values.

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-A06-6-S-19-1217 ng/L	WI-A06-6-S-19P-1217 ng/L	RPD	Qualifie
PFBS	4.22	4.15	2%	None
PFHxA	21.8	22.8	4%	
PFHpA	1.66	1.95	16%	
PFHxS	6.21	5.39	14%	
PFOA	4.21	4.20	0%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 5/15/18

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: W	-A06-6-S-04-1217								Mod	ified EPA Meth	nod 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll	Wal	ter Dec-17 10:15	Lab :	Sample: Received:	1701943-0 13-Dec-17		Column:	ВЕН С18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.79	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFHxA		6.84	2.18	5.00	8.00	J	B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFHpA		ND	0.591	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	
PFHxS		ND	0.947	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFOA		ND	0.651	5.00	8.00		B7L0171	22-Dec-17	0.125 L	-31-Dec-17 17:47	1
PFOS		ND	0.807	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFNA		ND	0.810	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFDA		ND	1.49	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
MeFOSAA		ND	1.65	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFUnA		ND	1.05	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
EtFOSAA		ND	1.37	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFDoA		ND	0.792	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFTrDA		ND	0.494	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
PFTeDA		ND	0.755	5.00	8.00		B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	121		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFHxA	IS	121		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C4-PFHpA	IS	120		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
18O2-PFHxS	IS	125		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	3
13C2-PFOA	IS	126		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C8-PFOS	IS	113		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C5-PFNA	IS	99.4		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFDA	IS	145		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
d3-MeFOSAA	IS	116		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFUnA	IS	104		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
d5-EtFOSAA	IS	122		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFDoA	IS	87.3		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1
13C2-PFTeDA	IS	94.3		50 - 150			B7L0171	22-Dec-17	0.125 L	31-Dec-17 17:47	1

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



Sample ID: W	/I-A06-6-S-19-1217								Mod	ified EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Col		Vater 1-Dec-17 11:55	Lab S	Sample: Received:	1701943-0 13-Dec-17		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualiflers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		4.22	1.85	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFHxA		21.8	2.26	5.17	8,29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFHpA		1.66	0.612	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFHxS		6.21	0.981	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	31
PFOA		4.21	0.675	5.17	8.29	J	B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFOS		ND	0.836	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFNA		ND	0.839	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFDA		ND	1.54	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
MeFOSAA		ND	1.71	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFUnA		ND	1.09	5.17	8.29		B7L0171	22-Dec-17	0,121 L	31-Dec-17 17:58	1
EtFOSAA		ND	1,42	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFDoA		ND	0.821	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFTrDA		ND	0.512	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
PFTeDA		ND	0.782	5.17	8.29		B7L0171	22-Dec-17	0.121L	31-Dec-17 17:58	Ĭ
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	123		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFHxA	IS	126		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	Î
13C4-PFHpA	IS	113		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
18O2-PFHxS	IS	120		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFOA	IS	107		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C8-PFOS	IS	122		50 - 150			B7L0171	22-Dec-17	0.121 し	31-Dec-17 17:58	1
13C5-PFNA	IS	121		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFDA	IS	109		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
d3-MeFOSAA	IS	112		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFUnA	IS	120		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
d5-EtFOSAA	IS	109		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1
13C2-PFDoA	IS	90.5		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	Ĩ
13C2-PFTeDA	IS	94.5		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 17:58	1

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



Sample ID: W	I-A06-6-S-19P-1217								Mod	ified EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll		ater -Dec-17 11:55	Lab	Sample: Received:	1701943-0 13-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		4.15	1.87	5.21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFHxA		22.8	2.27	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	
PFHpA		1.95	0.616	5,21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	
PFHxS		5.39	0.987	5.21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFOA		4.20	0.678	5.21	8.34	J	B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFOS		ND	0.841	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFNA		ND	0.844	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFDA		ND	1.55	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
MeFOSAA		ND	1.72	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFUnA		ND	1.09	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
EtFOSAA		ND	1.43	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFDoA		ND	0.825	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
PFTrDA		ND	0.515	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	Ĩ
PFTeDA		ND	0.787	5.21	8.34		B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	125		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFHxA	IS	114		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C4-PFHpA	IS	118		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
18O2-PFHxS	IS	101		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFOA	IS	118		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C8-PFOS	IS	122		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C5-PFNA	IS	124		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFDA	IS	107		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
d3-MeFOSAA	lS	118		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFUnA	IS	119		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
d5-EtFOSAA	IS	115		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFDoA	IS	93.9		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1
13C2-PFTeDA	IS	98.4		50 - 150			B7L0171	22-Dec-17	0.120 L	31-Dec-17 18:09	1

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



Sample ID: WI	I-A06-6-S-31-1217								Mod	ified EPA Meth	hod 537
Client Data					Labo	oratory Data					
Name:	CH2M Hill	Matrix:	Wate	r	Lab 9	Sample:	1701943-0	07	Column	BEH C18	
Project:	WHIDBEY ISLAND / 695610.05.F1.FS	Date Coll	ected: 11-D	ec-17 14:10		Received:	13-Dec-11	7 09:28	Column	DETICIO	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		14.3	1.80	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
PFHxA		58,3	2.20	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFHpA		29.3	0.595	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFHxS		41.1	0.954	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFOA		53.8	0.656	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFOS		1.82	0.813	5.04	8.06	J	B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFNA		ND	0.816	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFDA		ND	1.50	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
MeFOSAA		ND	1.66	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFUnA		ND	1.06	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
EtFOSAA		ND	1.38	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFDoA		ND	0.798	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFTrDA		ND	0.498	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
PFTeDA		ND	0.761	5.04	8.06		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
Labeled Standards	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	133		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFHxA	IS	119		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C4-PFHpA	lS	118		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
18O2-PFHxS	IS	137		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFOA	IS	114		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C8-PFOS	IS	123		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C5-PFNA	IS	117		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFDA	IS	133		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	I
d3-MeFOSAA	IS	107		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFUnA	IS	129		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
d5-EtFOSAA	IS	122		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
13C2-PFDoA	IS	71.9		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	
13C2-PFTeDA	IS	91.6		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:20	1
DL - Datastian Limit	LOD. Limit of Datastian			uit - upper control lim				PEOA and PEOS			

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



Sample ID: W	I-A06-EB07-121117								Mod	ified EPA Meth	od 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll	Wate	er Dec-17 14:45	Lab S	oratory Data Sample: Received:	1701943-0 13-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.86	5,17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	- 1
PFHxA		ND	2.26	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFHpA		ND	0.613	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFHxS		ND	0.982	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFOA		ND	0.675	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFOS		ND	0.837	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFNA		ND	0.840	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFDA		ND	1.54	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	i
MeFOSAA		ND	1.71	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFUnA		ND	1.09	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
EtFOSAA		ND	1.42	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFDoA		ND	0.821	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFTrDA		ND	0.512	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
PFTeDA		ND	0.783	5.17	8.29		B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	142		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFHxA	IS	118		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	I
13C4-PFHpA	IS	118		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
18O2-PFHxS	IS	124		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFOA	IS	106		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C8-PFOS	IS	116		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C5-PFNA	IS	114		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFDA	IS	117		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
d3-MeFOSAA	IS	128		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	Î
13C2-PFUnA	IS	108		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
d5-EtFOSAA	IS	129		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFDoA	IS	87.9		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1
13C2-PFTeDA	IS	85.4		50 - 150			B7L0171	22-Dec-17	0.121 L	31-Dec-17 18:32	1

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



Sample ID: W	I-A06-6-S-08-1217								Mod	ified EPA Meth	nod 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll	Wate ected [2-D	r Jec-17 09:35	Lab S	oratory Data Sample: Received:	1701943-1 13-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.81	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	- 1
PFHxA		ND	2.21	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	32
PFHpA		ND	0.598	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	20
PFHxS		ND	0.958	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	
PFOA		ND	0.659	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	
PFOS		ND	0.816	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFNA		ND	0.820	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFDA		ND	1.51	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	i
MeFOSAA		ND	1.67	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFUnA		ND	1.06	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
EtFOSAA		ND	1.39	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFDoA		ND	0.801	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFTrDA		ND	0.500	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
PFTeDA		ND	0.764	5.04	8.09		B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	135		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFHxA	IS	115		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C4-PFHpA	IS	122		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
18O2-PFHxS	IS	120		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFOA	IS	88.2		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C8-PFOS	IS	112		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C5-PFNA	IS	92.1		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFDA	IS	83.9		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	I
d3-MeFOSAA	IS	104		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFUnA	IS	98.7		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
d5-EtFOSAA	IS	100		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFDoA	IS	81.9		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	1
13C2-PFTeDA	IS	75.5		50 - 150			B7L0171	22-Dec-17	0.124 L	31-Dec-17 18:43	Ĩ

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



Sample ID: W	/I-A06-EB08-121217								Mod	ified EPA Meth	hod 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll		Water 12-Dec-17 10:25	Lab :	oratory Data Sample: Received:	1701943- 13-Dec-1		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.83	3 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFHxA		ND	2.22	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFHpA		ND	0.60	3 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFHxS		ND	0.96	6 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFOA		ND	0.66	4 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFOS		ND	0.82	3 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFNA		ND	0.82	6 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFDA		ND	1.52	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
MeFOSAA		ND	1.68	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFUnA		ND	1.07	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
EtFOSAA		ND	1.40	5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFDoA		ND	0.80	8 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFTrDA		ND	0.50	4 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
PFTeDA		ND	0.77	0 5.08	8.16		B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	110		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFHxA	IS	112		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C4-PFHpA	IS	112		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
18O2-PFHxS	IS	109		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFOA	IS	121		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C8-PFOS	IS	118		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C5-PFNA	IS	90.5		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFDA	IS	78.8		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
d3-MeFOSAA	IS	80.5		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	3
13C2-PFUnA	IS	77.9		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
d5-EtFOSAA	IS	66.0		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFDoA	IS	84.1		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
13C2-PFTeDA	IS	89.7		50 - 150			B7L0171	22-Dec-17	0.123 L	30-Dec-17 17:08	1
D1 - Datection Limit	LOD - Limit of Detection	1.77 1.179	Landaraa	urol limit - upper control lim		When ret	vorted PEH+S	PEOA and PEOS	include both line	ar and branched isomer	ris:

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

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DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1701882

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-6-I-01-1217	1701882-01	Water
3	WI-A06-EB01-120517	1701882-03	Water
5	WI-A06-EB02-120517	1701882-05	Water
7	WI-A06-EFF01-1217	1701882-07	Water
9	WI-A06-EFF01P-1217	1701882-09	Water
11	WI-A06-INF01-1217	1701882-11	Water
13	WI-A06-P-4-1217	1701882-13	Water
15	WI-A06-6-I-03-1217	1701882-15	Water

A full data validation was performed on the analytical data for six water samples and two aqueous equipment blank samples collected on December 5-6, 2017 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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.

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
WI-A06-EB01-120517	None - ND	-	-	18
WI-A06-EB02-120517	None - ND	140	H	

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate %R values.

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

• MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-A06-EFF01-1217 ng/L	WI-A06-EFF01p-1217 ng/L	RPD	Qualifier
PFBS	10.5	10.0	5%	None
PFHxA	40.7	37.4	8%	
PFHpA	11.8	11.3	4%	
PFHxS	43.0	49.2	13%	
PFOA	35.8	28.6	22%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 5/15/18

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: V	VI-A06-6-I-01-1217								Mod	ified EPA Meth	hod 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll	Wate	er Dec-17 14:45	Lab S	oratory Data Sample: Received:	1701882-0 07-Dec-17		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.93	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFHxA		ND	2.36	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFHpA		ND	0.639	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
PFHxS		ND	1.02	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
PFOA		1.09	0.703	5.39	8,64	J	B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
PFOS		ND	0.872	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
PFNA		ND	0.875	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
PFDA		ND	1.61	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
MeFOSAA		ND	1.78	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
PFUnA		ND	1.13	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
EtFOSAA		ND	1,48	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFDoA		ND	0.856	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
PFTrDA		ND	0.534	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	
PFTeDA		ND	0.816	5.39	8.64		B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	115		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFHxA	IS	109		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C4-PFHpA	IS	112		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
18O2-PFHxS	IS	92.4		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFOA	IS	112		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C8-PFOS	IS	112		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C5-PFNA	IS	109		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFDA	IS	98.0		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
d3-MeFOSAA	IS	114		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFUnA	IS	97.8		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
d5-EtFOSAA	IS	125		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFDoA	IS	105		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
13C2-PFTeDA	IS	96.0		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 16:18	1
DL - Detection Lim	nit LOD - Limit of Detection	LCLUCI	Lauras control li	nit - upper control lim	i.	When ret	vorted PEHvS	PEOA and PEOS	include both line	ear and branched isomer	rs:

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

Work Order 1701882



Sample ID: W	I-A06-EB01-120517								Mod	ified EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.Fl.FS	Matrix: Date Coll	Wate	er Dec-17 08:40	Lab S	Sample: Received:	1701882-0 07-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.94	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFHxA		ND	2.37	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	
PFHpA		ND	0.642	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	
PFHxS		ND	1.03	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFOA		ND	0.707	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFOS		ND	0.876	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFNA		ND	0.879	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFDA		ND	1.62	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
MeFOSAA		ND	1.79	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	
PFUnA		ND	1.14	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
EtFOSAA		ND	1.49	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFDoA		ND	0.860	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFTrDA		ND	0.536	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
PFTeDA		ND	0.820	5.43	8.69		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	105		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C2-PFHxA	IS	108		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	I
13C4-PFHpA	IS	119		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
18O2-PFHxS	IS	121		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C2-PFOA	IS	116		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C8-PFOS	IS	93.0		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C5-PFNA	IS	111		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C2-PFDA	IS	89.7		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
d3-MeFOSAA	IS	116		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C2-PFUnA	IS	85.5		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
d5-EtFOSAA	IS	118		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C2-PFDoA	IS	108		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
13C2-PFTeDA	IS	110		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:29	1
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL-	Lower control li	mit - upper control limi		When rep	orted, PFHxS,	PFOA and PFOS	include both line	ar and branched isomers	S.,

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



Sample ID: Wi	I-A06-EB02-120517								Mod	ified EPA Meth	iod 537
Client Data Name: Project:	CH2M Hill WHłDBEY ISLAND / 695610.05.Fl.FS	Matrix: Date Coll		Water 05-Dec-17 16:20	Lab	oratory Data Sample: Received:	1701882-0 07-Dec-17		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualiflers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.89	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFHxA		ND	2.30		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFHpA		ND	0.62	3 5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	
PFHxS		ND	0.99	9 5.25	8.44		B7L0138	19-Dec-17	0.119 Ł	23-Dec-17 16:40	1
PFOA		ND	0.68	7 5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFOS		ND	0.85		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFNA		ND	0.85		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFDA		ND	1.57		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	
MeFOSAA		ND	1.74		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFUnA		ND	1.11		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
EtFOSAA		ND	1,44	5.25	8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFDoA		ND	0.83		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFTrDA		ND	0.52		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
PFTeDA		ND	0.79		8.44		B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	117		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFHxA	IS	109		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C4-PFHpA	IS	116		50 - 150			B7L0138	19-Dec-17	0,119 L	23-Dec-17 16:40	1
18O2-PFHxS	IS	109		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFOA	IS	114		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C8-PFOS	IS	89,2		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C5-PFNA	IS	93.1		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
13C2-PFDA	IS	92.8		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
d3-MeFOSAA	IS	70.7		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
I3C2-PFUnA	IS	69.0		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
d5-EtFOSAA	IS	86.0		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	
13C2-PFDoA	IS	74.3		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	ï
13C2-PFTeDA	IS	73.1		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 16:40	1
		1.01.1101		taul limit - manus control limi		William area	and period	BECVA and DECK	To A of the Acids Black	ear and branched isomer	

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

Only the linear isomer is reported for all other analytes.

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Sample ID: W	I-A06-EFF01-1217								Mod	ified EPA Meth	nod 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll		Water 05-Dec-17 12:10	Lab S	oratory Data Sample: Received:	1701882-0 07-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		10.5	1.94	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFHxA		40.7	2.36	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	
PFHpA		11.8	0.640		8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFHxS		43.0	1.03	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFOA		35.8	0.705	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFOS		ND	0.874		8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFNA		ND	0.877		8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFDA		ND	1.61	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
MeFOSAA		ND	1.79	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFUnA		ND	1.14	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	ī
EtFOSAA		ND	1.48	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFDoA		ND	0.858	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFTrDA		ND	0.535	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
PFTeDA		ND	0.818	5.43	8.66		B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
Labeled Standard	ls Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	98.2		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFHxA	IS	98.6		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C4-PFHpA	IS	98.9		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
18O2-PFHxS	!S	121		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFOA	IS	109		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C8-PFOS	IS	105		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C5-PFNA	IS	103		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFDA	IS	92.2		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
d3-MeFOSAA	IS	101		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFUnA	IS	92.5		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
d5-EtFOSAA	IS	103		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFDoA	IS	115		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
13C2-PFTeDA	IS	90.4		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 16:51	1
		171 1101						DECLA and DECLE			

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

Only the linear isomer is reported for all other analytes.

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Sample ID: WI-A06-EFF01P-1217 Modified EPA Method 537												
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610,05.Fl.FS	Matrix: Water Date Collected: 05-Dec-17 12:10			Lab S	oratory Data Sample: Received:	1701882-09 07-Dec-17 09:23		Column	: BEH C18		
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS		10.0	1.93	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1_	
PFHxA		37.4	2.35	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFHpA		11.3	0.637	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFHxS		49.2	1.02	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFOA		28.6	0.702	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFOS		ND	0.870	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFNA		ND	0.873	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFDA		ND	1.61	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
MeFOSAA		ND	1.78	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFUnA		ND	1.13	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	- 1	
EtFOSAA		ND	1.48	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFDoA		ND	0.854	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFTrDA		ND	0.533	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
PFTeDA		ND	0.814	5.39	8.63		B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	92.4		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	Ī	
13C2-PFHxA	IS	104		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C4-PFHpA	IS	93.4		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
18O2-PFHxS	IS	102		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C2-PFOA	IS	130		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C8-PFOS	IS	94.2		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C5-PFNA	IS	88.4		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C2-PFDA	IS	77.1		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
d3-MeFOSAA	IS	103		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C2-PFUnA	IS	110		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
d5-EtFOSAA	IS	97.4		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C2-PFDoA	IS	126		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
13C2-PFTeDA	IS	116		50 - 150			B7L0138	19-Dec-17	0.116 L	23-Dec-17 17:03	1	
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL-	Lower control I	imit - upper control limit		When rep	orted, PFHxS, I	PFOA and PFOS	include both line	ear and branched isomer	SA	

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



Sample ID: WI-A06-INF01-1217 Modified EPA Method 537											
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.Fl.FS	Matrix: Date Coll		/ater 5-Dec-17 12:15	Lab S	Sample: Received:	1701882-1 07-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		10.6	1.95	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFHxA		39.5	2.38	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFHpA		11.3	0.645	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	
PFHxS		45.7	1.03	5,43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFOA		35.1	0.710	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFOS		ND	0.880	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFNA		ND	0.884	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFDA		ND	1.63	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
MeFOSAA		ND	1.80	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFUnA		ND	1.15	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
EtFOSAA		ND	1.49	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFDoA		ND	0.864	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	
PFTrDA		ND	0.539	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
PFTeDA		ND	0.824	5.43	8.73		B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	102		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
13C2-PFHxA	IS	103		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	Ĭ
13C4-PFHpA	IS	112		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
18O2-PFHxS	IS	112		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
13C2-PFOA	IS	104		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
13C8-PFOS	IS	91.6		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	
13C5-PFNA	IS	82.7		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
13C2-PFDA	IS	104		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
d3-MeFOSAA	IS	96.0		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
13C2-PFUnA	IS	115		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
d5-EtFOSAA	IS	90.7		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
13C2-PFDoA	IS	113		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
13C2-PFTeDA	IS	- 115		50 - 150			B7L0138	19-Dec-17	0.115 L	23-Dec-17 17:14	1
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL-	Lower contro	l limit - upper control limit		When rep	orted, PFHxS, I	PFOA and PFOS	include both line	ear and branched isomer	rs.

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit Results reported to the DL.



Sample ID: WI-A06-P-4-1217 Modified EPA Method 537											
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.Fl.FS	Matrix: Date Coll		Vater 05-Dec-17 10:50	Lab S	Dratory Data Sample: Received:	1701882- 07-Dec-17		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		9.73	1.88	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFHxA		34.3	2.29	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	- 2
PFHpA		11.9	0.622	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFHxS		35.0	0.996	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFOA		58.2	0.685	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFOS		ND	0.849	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFNA		1.49	0.852	5.25	8.42	J	B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFDA		ND	1.57	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
MeFOSAA		ND	1.74	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFUnA		ND	1.10	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
EtFOSAA		ND	1.44	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFDoA		ND	0.833	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFTrDA		ND	0.520	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
PFTeDA		ND	0.794	5.25	8.42		B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	ĩ
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	107		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	ŧ
13C2-PFHxA	IS	111		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	Ĩ
13C4-PFHpA	18	101		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
18O2-PFHxS	IS	109		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
13C2-PFOA	IS	111		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
13C8-PFOS	IS	118		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
13C5-PFNA	IS	89.7		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
13C2-PFDA	IS	127		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
d3-MeFOSAA	IS	97.4		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
13C2-PFUnA	IS	75.0		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
d5-EtFOSAA	IS	90.4		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
13C2-PFDoA	IS	95.5		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
13C2-PFTeDA	IS	85.8		50 - 150			B7L0138	19-Dec-17	0.119 L	23-Dec-17 17:25	1
						When a m		DECVA and DECVE			

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

Only the linear isomer is reported for all other analytes.

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Sample ID: WI-A06-6-I-03-1217 Modified EPA Method 537											
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610,05.FI.FS	Matrix: Date Coll	Wate ected 06-E	er Dec-17 10:35	Lab S	Sample: Received:	1701882- 07-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	2.04	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFHxA		ND	2.48	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFHpA		ND	0.673	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	
PFHxS		ND	1.08	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	
PFOA		ND	0.741	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFOS		ND	0.919	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	
PFNA		ND	0.922	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFDA		ND	1.70	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
MeFOSAA		ND	1.88	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFUnA		ND	1.20	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
EtFOSAA		ND	1.56	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFDoA		ND	0.902	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFTrDA		ND	0.563	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
PFTeDA		ND	0.860	5.68	9.11		B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	105		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
13C2-PFHxA	IS	98.7		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	Ì
13C4-PFHpA	IS	97.8		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
18O2-PFHxS	IS	132		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
13C2-PFOA	IS	102		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
13C8-PFOS	IS	114		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
13C5-PFNA	IS	85.8		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
13C2-PFDA	IS	97.6		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	
d3-MeFOSAA	IS	101		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
13C2-PFUnA	IS	80.0		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	1
d5-EtFOSAA	IS	84.0		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	
13C2-PFDoA	IS	75.3		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	Î
13C2-PFTeDA	IS	84.0		50 - 150			B7L0138	19-Dec-17	0.110 L	23-Dec-17 17:36	

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

1701911

Laboratory:

Vista Analytical Laboratory, El Dorado Hills, California NAS Whidbey Island, Area 6, CTO-4041, Washington

Site: Date:

May 12, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-6-S-17-1217	1701911-01	Water
3	WI-A06-EB03-120617	1701911-03	Water
5	WI-A06-6-S-07-1217	1701911-05	Water
5MS	WI-A06-6-S-07-1217MS	1701911-05MS	Water
5MSD	WI-A06-6-S-07-1217MSD	1701911-05MSD	Water
7	WI-A06-6-S-26-1217	1701911-07	Water
9	WI-A06-EB04-120717	1701911-09	Water
11	WI-A06-EB05-120717	1701911-11	Water
13	WI-A06-FB01-120717	1701911-13	Water
15	WI-A06-MW-10-1217	1701911-15	Water
17	WI-A06-6-S-14-1217	1701911-17	Water
19	WI-A06-6-S-44-1217	1701911-19	Water
21	WI-A06-EB06-120817	1701911-21	Water

A full data validation was performed on the analytical data for six water samples, four aqueous equipment blank samples, and one aqueous field blank sample collected on December 6-8, 2017 by CH2M HILL at the NAS Whidbey Island Area 6 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 PFCs

Method References

USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

Data Completeness, Case Natrative & 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.

GC/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 exhibited the following contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
B7L0145-BLK1	PFOA	0.716	U	1, 9, 15

Field QC Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
WI-A06-EB03-120617	None - ND		50	5
WI-A06-EB04-120717	None - ND	675	100	
WI-A06-EB05-120717	None - ND	===	2.	
WI-A06-FB01-120717	None - ND		57.5	5
WI-A06-EB06-120817	None - ND	583		¥

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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	Affected Samples
5	PFTeDA	OK/151%/41.5	None	Sample ND

Laboratory Control Samples

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 (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: S/15/18

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: W	/I-A06-6-S-17-1217								Mod	ified EPA Metl	hod 537
Client Data Name:	CH2M Hill	Matrix:	Wat	ter		oratory Data Sample:	1701911-0	11	Calumn	DELL CLO	
Project:	WHIDBEY ISLAND / 695610.05.FI.FS	Date Coll		Dec-17 13:05		Received:	09-Dec-17		Column	: BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.88	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFHxA		ND	2.29	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFHpA		ND	0.620	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFHxS		ND	0.994	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	ľ
PFOA		5.25 1.82 U	0.683	5.25	8.39	J.B	B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFOS		ND	0.847	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	- 18
PFNA		ND	0.850	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFDA		ND	1.56	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
MeFOSAA		ND	1.73	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFUnA		ND	1.10	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
EtFOSAA		ND	1.44	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFDoA		ND	0.831	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFTrDA		ND	0.518	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
PFTeDA		ND	0.792	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	87.3		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFHxA	IS	93.9		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C4-PFHpA	IS	95.0		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
18O2-PFHxS	IS	98.6		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFOA	IS	83.4		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C8-PFOS	IS	78.6		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C5-PFNA	IS	80.1		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFDA	IS	74.4		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
d3-MeFOSAA	IS	85.8		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFUnA	IS	97.0		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
d5-EtFOSAA	IS	83.9		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
13C2-PFDoA	IS	138		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	4
13C2-PFTeDA	IS	118		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 00:18	1
DI Datastion Limit	LOD Limit of Detection	1.01.1101	Lower control L	imit - upper control limit		When ren	vorted PEHvS	PEOA and PEOS	include both line	ear and branched isomer	es .

LOD - Limit of Detection

LOQ - Limit of quantitation

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

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Sample ID: W	VI-A06-EB03-120617								Mod	ified EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll	Wat ected: 06-	eer Dec-17 15:20	Lab S	oratory Data Sample: Received:	1701911-0 09-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.91	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFHxA		ND	2.33	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFHpA		ND	0.631	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFHxS		ND	1.01	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFOA		ND	0.695	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFOS		ND	0.862	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFNA		ND	0.865	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFDA		ND	1.59	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
MeFOSAA		ND	1.76	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFUnA		ND	1.12	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	
EtFOSAA		ND	1.46	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFDoA		ND	0.846	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
PFTrDA		ND	0.528	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	i
PFTeDA		ND	0.806	5.34	8.54		B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	84.3		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFHxA	IS	90.2		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C4-PFHpA	IS	101		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
18O2-PFHxS	IS	89.1		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	
13C2-PFOA	IS	102		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C8-PFOS	IS	67.0		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C5-PFNA	IS	83.2		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFDA	IS	68.4		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
d3-MeFOSAA	IS	69.2		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFUnA	IS	67.0		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
d5-EtFOSAA	IS	71.0		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFDoA	IS	76.1		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
13C2-PFTeDA	IS	77.6		50 - 150			B7L0145	20-Dec-17	0.117 L	24-Dec-17 00:30	1
DL - Detection Limi	it LOD - Limit of Detection	LCL-UCL-	Lower control li	imit - upper control limit		When rep	orted, PFHxS,	PFOA and PFOS	include both line	ar and branched isomer	S.

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Results reported to the DL.

LOQ - Limit of quantitation

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Only the linear isomer is reported for all other analytes.



Sample ID: WI	I-A06-6-S-07-1217								Mod	ified EPA Metl	hod 537
	CH2M Hill WHIDBEY ISLAND / 695610.05.Fl.FS	Matrix: Date Coll	Wate	r Pec-17 11:50	Lab S	Sample: Received:	1701911-0 09-Dec-1		Column	ВЕН С18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		13.0	1.92	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFHxA		40.7	2.34	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFHpA		10.3	0.634	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	
PFHxS		35.0	1.02	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFOA		39.2	0.699	5.39	8.59	В	B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFOS		ND	0.866	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFNA		ND	0.870	5.39	8,59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFDA		ND	1.60	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	
MeFOSAA		ND	1.77	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	
PFUnA		ND	1.13	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	
EtFOSAA		ND	1.47	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFDoA		ND	0.850	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFTrDA		ND	0.530	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
PFTeDA		ND	0.811	5.39	8.59		B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
Labeled Standards	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	97.3		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFHxA	IS	93.3		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C4-PFHpA	IS	92.1		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
18O2-PFHxS	IS	97.1		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFOA	IS	92.0		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	
13C8-PFOS	IS	101		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	
13C5-PFNA	IS	85.1		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFDA	IS	87.8		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
d3-MeFOSAA	IS	89.7		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	
13C2-PFUnA	IS	84.1		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	ī
d5-EtFOSAA	IS	74.8		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
13C2-PFDoA	IS	96.1		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	Ĩ
13C2-PFTeDA	IS	99.9		50 - 150			B7L0145	20-Dec-17	0.116 L	24-Dec-17 01:14	1
		177, 1101	Lucius assisul lis						include both lin		

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



Sample ID: WI	-A06-6-S-26-1217								Mod	ified EPA Meth	od 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll	Wat ected: 07-1	er Dec-17 13:40	Lab S	Sample: Received:	1701911-09-Dec-1		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		9.28	1.86	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFHxA		35.2	2.27	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFHpA		13.4	0.616	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	
PFHxS		47.8	0.987	5.21	8.33	G.	B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFOA		52.3	0.678	5.21	8.33	B	B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFOS		5.60	0.841	5.21	8.33	J	B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	
PFNA		3.71	0.844	5.21	8.33	J	B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFDA		ND	1.55	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
MeFOSAA		ND	1.72	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFUnA		ND	1.09	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	
EtFOSAA		ND	1.43	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFDoA		ND	0.825	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFTrDA		ND	0.515	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
PFTeDA		ND	0.787	5.21	8.33		B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
Labeled Standard	s Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	102		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFHxA	IS	99.2		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C4-PFHpA	IS	98.5		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
18O2-PFHxS	IS	109		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFOA	IS	116		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C8-PFOS	IS	77.9		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C5-PFNA	IS	112		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFDA	IS	69.3		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
d3-MeFOSAA	IS	58.6		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFUnA	IS	71.1		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
d5-EtFOSAA	IS	61.1		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFDoA	IS	83.8		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
13C2-PFTeDA	IS	71.7		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 01:26	1
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LOD - Limit of Detection LOQ - Limit of quantitation LCL-UCL- Lower control limit - upper control limit Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

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Sample ID: WI	-A06-EB04-120717								Mod	ified EPA Metl	hod 537
	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Colle	Wa ected: 07-	iter -Dec-17 13:50	Lat	boratory Data b Sample: te Received:	1701911-0 09-Dec-17		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.96	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFHxA		ND	2.38	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	
PFHpA		ND	0.646	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFHxS		ND	1.03	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFOA		5.48 +75 W	0.711	5.48	8.74	TB	B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFOS		ND	0.882	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFNA		ND	0.885	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFDA		ND	1.63	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
MeFOSAA		ND	1.80	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFUnA		ND	1.15	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	31
EtFOSAA		ND	1.50	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFDoA		ND	0.865	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	Ĭ.
PFTrDA		ND	0.540	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
PFTeDA		ND	0.825	5.48	8.74		B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	79.4		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFHxA	IS	66.9		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C4-PFHpA	IS	70.5		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
18O2-PFHxS	IS	62.6		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFOA	IS	74.2		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C8-PFOS	IS	69.5		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C5-PFNA	IS	56.3		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFDA	IS	56.4		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
d3-MeFOSAA	IS	60.6		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFUnA	IS	66.3		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
d5-EtFOSAA	IS	53.4		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFDoA	IS	88.7		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
13C2-PFTeDA	IS	71.4		50 - 150			B7L0145	20-Dec-17	0.114 L	24-Dec-17 01:37	1
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL-	Lower control I	limit - upper control limit		When rep		PFOA and PFOS	include both line	ear and branched isomer	rs.

per 8/12/18

Results reported to the DL.

LOQ - Limit of quantitation

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Only the linear isomer is reported for all other analytes.



Sample ID: WI-	-A06-EB05-120717								Mod	ified EPA Metl	hod 537
	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll	Wate	er Dec-17 14:30	Lab S	Sample: Received:	1701911-1 09-Dec-1		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.85	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFHxA		ND	2.26	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFHpA		ND	0.612	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFHxS		ND	0.980	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFOA		ND	0.674	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFOS		ND	0.835	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFNA		ND	0.838	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFDA		ND	1.54	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1/2
MeFOSAA		ND	1.71	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFUnA		ND	1.09	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
EtFOSAA		ND	1.42	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	
PFDoA		ND	0.820	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFTrDA		ND	0.511	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
PFTeDA		ND	0.781	5.17	8.28		B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	97.2		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFHxA	IS	95.8		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C4-PFHpA	IS	98.5		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	Ĩ
18O2-PFHxS	IS	103		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFOA	IS	96.4		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C8-PFOS	18	82.3		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C5-PFNA	IS	76.7		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFDA	IS	75.1		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
d3-MeFOSAA	IS	57.8		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFUnA	IS	61.5		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
d5-EtFOSAA	IS	59.1		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFDoA	IS	76.2		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
13C2-PFTeDA	IS	68.1		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 01:48	1
DL - Detection Limit	LOD - Limit of Detection	LOUIN	C 112	mit - upper control lim		W/h	noted better	DECAY DECAE	Sandard a briefe the	ear and branched isomer	

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

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



Sample ID: W	VI-A06-FB01-120717								Mod	ified EPA Metl	hod 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll		Water 07-Dec-17 14:45	Lab S	Sample: Received:	1701911-1 09-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.88	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFHxA		ND	2.29	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFHpA		ND	0.620	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFHxS		ND	0.993	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFOA		ND	0.683	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFOS		ND	0.846	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFNA		ND	0.849	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFDA		ND	1.56		8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
MeFOSAA		ND	1.73	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFUnA		ND	1.10	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
EtFOSAA		ND	1.44	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFDoA		ND	0.830	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	
PFTrDA		ND	0.518	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
PFTeDA		ND	0.792	5.25	8.39		B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	97.2		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
13C2-PFHxA	IS	86.4		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
13C4-PFHpA	IS	99.1		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
18O2-PFHxS	IS	98.6		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
13C2-PFOA	IS	93.9		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
13C8-PFOS	IS	70.5		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	
13C5-PFNA	IS	83.1		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	
13C2-PFDA	IS	72.5		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
d3-MeFOSAA	IS	91.5		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
13C2-PFUnA	IS	89.2		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	
d5-EtFOSAA	IS	96.6		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	
13C2-PFDoA	IS	98.6		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	
13C2-PFTeDA	IS	81.5		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 01:59	1
DL - Detection Limit	t LOD - Limit of Detection	LCL-UCL-	Lower cont	rol limit - upper control limi		When rep	orted, PFHxS,	PFOA and PFOS	include both line	ar and branched isomer	IS.

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

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



Sample ID: W	I-A06-MW-10-1217								Mod	ified EPA Metl	nod 537
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.Fl.FS	Matrix: Date Coll	Water ected: 07-Dec	c-17 09:45	Lab :	Sample: Received:	1701911-1 09-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	ÐL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		2.30	2.00	5.58	8.92	J	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFHxA		5.44	2.43	5.58	8.92	J	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFHpA		ND	0.659	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFHxS		2.24	1.06	5.58	8.92	J	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	
PFOA		5.58 3.60 LL	0.726	5.58	8.92	TB	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFOS		ND	0.900	5.58	8.92	-	B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	
PFNA		ND	0.903	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFDA		ND	1.66	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
MeFOSAA		ND	1.84	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFUnA		ND	1.17	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
EtFOSAA		ND	1.53	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFDoA		ND	0.883	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFTrDA		ND	0.551	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
PFTeDA		ND	0.842	5.58	8.92		B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
Labeled Standard	ls Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	90.1		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C2-PFHxA	IS	88.3		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C4-PFHpA	IS	87.2		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
18O2-PFHxS	IS	88.1		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C2-PFOA	IS	89.2		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C8-PFOS	18	79.6		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C5-PFNA	IS	79.6		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C2-PFDA	IS	78.3		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
d3-MeFOSAA	IS	81.2		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C2-PFUnA	IS	94.5		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
d5-EtFOSAA	IS	85.9		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C2-PFDoA	IS	73.3		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1
13C2-PFTeDA	IS	83.3		50 - 150			B7L0145	20-Dec-17	0.112 L	24-Dec-17 02:10	1

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

MBL



Sample ID: WI-A06-6-S-14-1217 Modified EPA Method 537											
	Name: CH2M Hill		rix: Water Lab Sample: 2 Collected: 08-Dec-17 13:10 Laboratory Data Lab Sample: Date Received:		Sample:	1701911-17 09-Dec-17 10:05		Column: BEH C18			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		10.2	1.88	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFHxA		25.6	2.29	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	
PFHpA		3.61	0.621	5.25	8.41	J	B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	
PFHxS		13.8	0.996	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFOA		19.6	0.685	5.25	8.41	B	B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	
PFOS		ND	0.849	5.25	8.41	* (*)	B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFNA		ND	0.852	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFDA		ND	1.57	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	
MeFOSAA		ND	1.74	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFUnA		ND	1.10	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
EtFOSAA		ND	1.44	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	
PFDoA		ND	0.833	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFTrDA		ND	0.519	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
PFTeDA		ND	0.794	5.25	8.41		B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
Labeled Standards	s Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	90.3		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFHxA	IS	88.0		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	
13C4-PFHpA	IS	93.9		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
18O2-PFHxS	IS	103		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFOA	IS	111		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C8-PFOS	IS	75.9		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C5-PFNA	IS	86.5		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFDA	IS	80.8		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
d3-MeFOSAA	IS	94.9		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFUnA	IS	86.3		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
d5-EtFOSAA	IS	107		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFDoA	IS	115		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	1
13C2-PFTeDA	IS	103		50 - 150			B7L0145	20-Dec-17	0.119 L	24-Dec-17 02:21	_1
DI Datastian Limit	1 OD - Limit of Datastion			imit - unner control limi		11.7	T WILL C	mers a I merse		ear and branched isome	

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

Only the linear isomer is reported for all other analytes.



Sample ID: WI-A06-6-S-44-1217 Modified EPA Method 537											
	H2M Hill /HIDBEY ISLAND / 695610.05.Fl.FS	Matrix: Date Coll	Wate ected: 08-I	er Dec-17 10:50	Lab :	Sample: Received:	1701911- 09-Dec-1		Column	: BEH C18	
Analyte		Conc. (ng/L)	DL	LOĐ	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		10.5	1.84	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFHxA		44.7	2.25	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
PFHpA	· ·	13.4	0.609	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
PFHxS		62.5	0.976	5,17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
PFOA		96.9	0.671	5.17	8.24	B	B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
PFOS		ND	0.832	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
PFNA		6.30	0.835	5.17	8.24	J	B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
PFDA		ND	1.54	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
MeFOSAA		ND	1.70	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
PFUnA		ND	1.08	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
EtFOSAA		ND	1.41	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFDoA		ND	0.816	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFTrDA		ND	0.509	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
PFTeDA		ND	0.778	5.17	8.24		B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.8		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFHxA	IS	92.3		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C4-PFHpA	IS	93.5		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
18O2-PFHxS	IS	96.4		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFOA	IS	94.3		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C8-PFOS	IS	93.1		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C5-PFNA	IS	90.1		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFDA	IS	69.7		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	
d3-MeFOSAA	IS	69.1		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFUnA	IS	84.2		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
d5-EtFOSAA	IS	68.4		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	î
13C2-PFDoA	IS	82.7		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
13C2-PFTeDA	IS	95.7		50 - 150			B7L0145	20-Dec-17	0.121 L	24-Dec-17 02:33	1
DL - Detection Limit	LOD - Limit of Detection			mit - upper control lim		117	a d prince	pro t I pro		ear and branched isome	

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

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

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Sample ID: WI-A06-EB06-120817 Modified EPA Method 537											
Client Data Name: Project:	CH2M Hill WHIDBEY ISLAND / 695610.05.FI.FS	Matrix: Date Coll		Water 08-Dec-17 14:00	Lab :	Sample: Received:	1701911-2 09-Dec-17		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.87	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFHxA		ND	2.28	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFHpA		ND	0.618		8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFHxS		ND	0.990	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFOA		ND	0.681	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFOS		ND	0.844	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	. 1
PFNA		ND	0.847	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFDA		ND	1.56	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
MeFOSAA		ND	1.73	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFUnA		ND	1.10	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
EtFOSAA		ND	1.43	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFDoA		ND	0.828	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFTrDA		ND	0.517	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
PFTeDA		ND	0.790	5.21	8.37		B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
Labeled Standard	ls Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.1		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
13C2-PFHxA	IS	94.2		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	- 1
13C4-PFHpA	IS	87.8		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
18O2-PFHxS	IS	85.3		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
13C2-PFOA	IS	84.0		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
13C8-PFOS	IS	98.4		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	- 1
13C5-PFNA	IS	78.2		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
13C2-PFDA	IS	69.7		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
d3-MeFOSAA	IS	67.7		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	
13C2-PFUnA	IS	70.0		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	
d5-EtFOSAA	IS	55.1		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	
13C2-PFDoA	IS	82.6		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
13C2-PFTeDA	IS	83.7		50 - 150			B7L0145	20-Dec-17	0.120 L	24-Dec-17 02:44	1
DL - Detection Limit	LOD - Limit of Detection	LCLUCI	I	rol limit - upper control lim		When re	Ported PEHvS	PEOA and PEOS	include both lin	ear and branched isomer	450

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

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

NW8/12/8

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DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-75281-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1*	WI-A06-TB01-021918	580-75281-1	Water
2	WI-A06-EB01-021918	580-75281-2	Water
3	WI-A06-MW-13-0218	580-75281-3	Water
3MS†	WI-A06-MW-13-0218MS	580-75281-3MS	Water
3MSD†	WI-A06-MW-13-0218MSD	580-75281-3MSD	Water
4	WI-A06-RW17-0218	580-75281-4	Water
5	WI-A06-RW17P-0218	580-75281-5	Water
6	WI-A06-DW-38A-0218	580-75281-6	Water
7	WI-A06-6-S-27-0218	580-75281-7	Water
8	WI-A06-6-S-28-0218	580-75281-8	Water
9	WI-A06-FB01-022218	580-75281-9	Water
10	WI-A06-MW-01-0218	580-75281-10	Water
11	WI-A06-EB01-0218	580-75281-11	Water

* - VOC only † - SVOC only

A full data validation was performed on the analytical data for seven water samples, two aqueous equipment blank samples, one aqueous field blank sample, and one aqueous trip blank sample collected on February 19-21, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

• All criteria were met.

Initial Calibration

 The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ug/L		
WI-A06-TB01-021918	None - ND	-	+	DR
WI-A06-EB01-021918	None - ND	(a)	a	(e)
WI-A06-FB01-022118	None - ND	(m)	= =	14
WI-A06-EB01-0218	None - ND	143	2	

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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

• The MS/MSD samples were not analyzed.

Laboratory Control Samples

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 results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND		2

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-021918	None - ND	SH2	97	8
WI-A06-FB01-022118	None - ND	165	=:	8
WI-A06-EB01-0218	None - ND		(4)	

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 ID	Compound	MS %R/MSD %R/ RPD	Qualifier	Affected Samples
3	1,4-Dioxane	OK/OK/33	None	For RPD Alone

Laboratory Control Samples

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 results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
1,4-Dioxane	ND	ND	H	=

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 5/15/18 Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-TB01-021918

Lab Sample ID:

580-75281-1

Client Matrix:

Water

Date Sampled: 02/19/2018 0700 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-268193

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

Lab File ID:

Dilution:

N/A

030118_08.D

1.0

Initial Weight/Volume: 5 mL

Analysis Date:

Final Weight/Volume: 5 mL

Prep Date:

03/01/2018 1533 03/01/2018 1533

Analyte Vinyl chloride Result (ug/L) 0.040

Qualifier U

DL 0.013 LOQ 0.50

Surrogate

%Rec 96

Qualifier

80 - 141

Acceptance Limits

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

100

77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-021918

580-75281-2

Lab Sample ID: Client Matrix: Water

Date Sampled: 02/19/2018 1645 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method:

5030B

Dilution: 1.0

Analysis Date: Prep Date:

03/01/2018 1556

03/01/2018 1556

Analysis Batch: Prep Batch:

580-268193

N/A

Instrument ID: Lab File ID:

TAC036 030118_09.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier **Acceptance Limits** Trifluorotoluene (Surr) 98 80 - 141 M Dibromofluoromethane (Surr) 99 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-13-0218

Lab Sample ID: 580-75281-3

Client Matrix: Water

Date Sampled: 02/20/2018 1110 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method:

5030B

1.0

Analysis Date: Prep Date:

Dilution:

03/01/2018 1620

03/01/2018 1620

Analysis Batch: Prep Batch:

580-268193 N/A

Instrument ID:

TAC036 030118_10.D

Lab File ID: Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate Trifluorotoluene (Surr) Dibromofluoromethane (Surr) %Rec 98 100

Qualifier M

80 - 141 77 - 118

Acceptance Limits

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-RW17-0218

Lab Sample ID:

580-75281-4

Client Matrix:

Water

Date Sampled: 02/20/2018 1340 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-268193

Instrument ID:

TAC036

Prep Method:

5030B

Dilution:

1.0

Prep Batch:

N/A

Lab File ID:

030118_11.D

Analysis Date:

03/01/2018 1644

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Prep Date:

03/01/2018 1644

Qualifier

DL

LOQ

Analyte Vinyl chloride Result (ug/L) 0.040

0.013

0.50

Surrogate

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

%Rec 97 100

Qualifier M

Acceptance Limits 80 - 141

77 - 118

TAC036

030118_12.D

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17P-0218

 Lab Sample ID:
 580-75281-5
 Date Sampled: 02/20/2018 1345

 Client Matrix:
 Water
 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Analysis Batch: 580-268193 Instrument ID: Prep Method: 5030B Prep Batch: N/A Lab File ID:

Dilution: 1.0 Initial Weight/Volume: 5 mL

Analysis Date: 03/01/2018 1708 Final Weight/Volume: 5 mL

Prep Date: 03/01/2018 1708

 Analyte
 Result (ug/L)
 Qualifier
 DL
 LOQ

 Vinyl chloride
 0.040
 U
 0.013
 0.50

Surrogate %Rec Qualifier Acceptance Limits
Trifluorotoluene (Surr) 97 80 - 141
Dibromofluoromethane (Surr) 100 M 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218 6

Lab Sample ID:

580-75281-6

Client Matrix:

Water

Date Sampled: 02/20/2018 1455 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

1.0

Dilution: Analysis Date:

03/01/2018 1731 Prep Date: 03/01/2018 1731 Analysis Batch:

N/A

580-268193

Instrument ID: Lab File ID:

TAC036 030118_13.D

Initial Weight/Volume: 5 mL Final Weight/Volume:

Analyte Result (ug/L) Qualifier DL LOQ 0.013 Vinyl chloride 0.040 U 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 98 80 - 141 Dibromofluoromethane (Surr) 101 M 77 - 118

Prep Batch:

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-6-S-27-0218

Lab Sample ID: 580-75281-7

Client Matrix:

Water

Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Prep Method: 5030B Dilution: 1.0

Surrogate

Analysis Date: 03/01/2018 1755

Prep Date: 03/01/2018 1755 Analysis Batch: 580-268193

Prep Batch: N/A

Qualifier

Instrument ID: Lab File ID:

TAC036 030118_14.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Acceptance Limits Trifluorotoluene (Surr) 97 80 - 141 Dibromofluoromethane (Surr) 100 M 77 - 118

%Rec

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06--6-S-28-0218

5030B

Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

Lab Sample ID: Client Matrix:

Prep Method:

Analysis Method: 8260C SIM

580-75281-8 Water

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Batch: 580-268193 Instrument ID: TAC036 Prep Batch: N/A Lab File ID: 030118_15.D

Dilution: 1.0 Initial Weight/Volume: 5 mL Analysis Date: 03/01/2018 1818

Final Weight/Volume: 5 mL Prep Date: 03/01/2018 1818

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 98 80 - 141 Dibromofluoromethane (Surr) 98 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-FB01-022118

Lab Sample ID: 580-75281-9

Client Matrix: Water

Date Sampled: 02/21/2018 1500 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Prep Method: 5030B

Dilution: 1.0

Analysis Date: Prep Date:

03/01/2018 1842

03/01/2018 1842

Analysis Batch:

Prep Batch:

580-268193

N/A

Instrument ID:

TAC036

Lab File ID: 030118_16.D Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 96 80 - 141 M Dibromofluoromethane (Surr) 99 77 - 118

TAC036

5 mL

030118_17.D

10

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

Lab Sample ID: 580-75281-10 Date Sampled: 02/21/2018 1510 Client Matrix: Water Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

N/A

580-268193

Instrument ID:

Initial Weight/Volume:

Final Weight/Volume: 5 mL

Lab File ID:

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: 03/01/2018 1906

Prep Date: 03/01/2018 1906

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Analysis Batch:

Prep Batch:

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 99 80 - 141 Dibromofluoromethane (Surr) 99 M 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-0218

Lab Sample ID: 580-75281-11

Client Matrix: Water Date Sampled: 02/21/2018 1650 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: 03/01/2018 1929

Prep Date: 03/01/2018 1929 Analysis Batch: Prep Batch:

580-268193

N/A

Instrument ID: Lab File ID:

TAC036 030118_18.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier **Acceptance Limits** Trifluorotoluene (Surr) 98 80 - 141 M Dibromofluoromethane (Surr) 101 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-EB01-021918

Lab Sample ID:

580-75281-2

Client Matrix: Water Date Sampled: 02/19/2018 1645 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method:

3520C

Lab File ID:

022728a006.D

Dilution:

1.0

Prep Batch:

580-267977

Initial Weight/Volume: 979 mL

Analysis Date:

02/27/2018 1650 02/26/2018 1348

Final Weight/Volume: Injection Volume:

2 mL

Analyte 1,4-Dioxane

Prep Date:

Result (ug/L) 0.031

Qualifier

U

DL 0.011 LOQ 0.10

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

90

53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-MW-13-0218

Lab Sample ID:

Client Matrix: Water

580-75281-3

Date Sampled: 02/20/2018 1110

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method:

3520C

Lab File ID:

Prep Batch:

Dilution:

580-267977

022728a007.D

Analysis Date: Prep Date:

1.0

Initial Weight/Volume: 977.2 mL

Final Weight/Volume: Injection Volume:

2 mL

Analyte 1,4-Dioxane 02/27/2018 1712 02/26/2018 1348

> Result (ug/L) 0.031

Qualifier

U

DL 0.011 LOQ 0.10

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenoi

70

53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75281-1

WI-A06-RW17-0218 **Client Sample ID:**

Lab Sample ID: 580-75281-4

Client Matrix: Water Date Sampled: 02/20/2018 1340 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date:

Prep Date:

02/26/2018 1348

02/27/2018 1819

Analysis Batch: Prep Batch:

580-268070 580-267977 Instrument ID: Lab File ID:

TAC050 022728a010.D

Initial Weight/Volume: 1003.5 mL Final Weight/Volume: 2 mL Injection Volume:

Analyte Result (ug/L) Qualifier LOQ DL 1,4-Dioxane 0.030 U 0.011 0.10

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 92 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17P-0218

Lab Sample ID: 580-75281-5 Date Sampled: 02/20/2018 1345 Client Matrix: Water Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C Dilution:

1.0

Analysis Date: 02/27/2018 1841 Prep Date: 02/26/2018 1348 Analysis Batch: 580-268070 Prep Batch:

580-267977

Instrument ID: Lab File ID:

TAC050 022728a011.D

Initial Weight/Volume: 969.4 mL Final Weight/Volume: 2 mL Injection Volume: 1 uL

Analyte Result (ug/L) Qualifier DL LOQ 1,4-Dioxane 0.031 0.011 0.10

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 100 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218

Lab Sample ID:

580-75281-6

Client Matrix: Water Date Sampled: 02/20/2018 1455 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: Prep Method: Dilution:

8270D SIM 3520C

1.0

Analysis Date: Prep Date:

02/27/2018 1903 02/26/2018 1348 Analysis Batch: 580-268070 Prep Batch:

580-267977

Instrument ID: TAC050 Lab File ID: 022728a012.D Initial Weight/Volume: 994.9 mL

Final Weight/Volume: 2 mL Injection Volume: 1 uL

Analyte 1,4-Dioxane

Result (ug/L) 1.7

Qualifier

DL 0.011 LOQ 0.10

Surrogate 2-Fluorophenol

%Rec

Qualifier

Acceptance Limits

96

Client: CH2M Hill, Inc. Job Number: 580-75281-1

WI-A06-6-S-27-0218 Client Sample ID:

Lab Sample ID: 580-75281-7

Client Matrix: Water Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date:

Prep Date:

02/26/2018 1348

02/27/2018 1925

Analysis Batch: Prep Batch:

580-268070

580-267977

Instrument ID: Lab File ID:

TAC050 022728a013.D

Initial Weight/Volume: 1032.1 mL Final Weight/Volume: 2 mL Injection Volume:

Analyte 1,4-Dioxane Result (ug/L)

Qualifier U

DL 0.011 LOQ 0.097

Surrogate 2-Fluorophenol %Rec

Qualifier

Acceptance Limits

91

0.029

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06--6-S-28-0218

Lab Sample ID

580-75281-8

Client Matrix:

Water

Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method:

3520C

Prep Batch:

Lab File ID:

Dilution:

1.0

580-267977

022728a014.D

Analysis Date:

Initial Weight/Volume: 1035.9 mL

Prep Date:

02/27/2018 1947

Final Weight/Volume: Injection Volume:

2 mL 1 uL

Analyte

Surrogate

02/26/2018 1348

Qualifier

DL 0.011 LOQ 0.097

1,4-Dioxane

0.029

Result (ug/L)

U

2-Fluorophenol

%Rec 78

Qualifier

Acceptance Limits

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-FB01-022118

Lab Sample ID:

580-75281-9

Client Matrix: Water

Date Sampled: 02/21/2018 1500 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method: Dilution:

3520C

Lab File ID:

1.0

Prep Batch:

580-267977

022728a015.D

Analysis Date: Prep Date:

U

Initial Weight/Volume:

989.4 mL

02/27/2018 2009 02/26/2018 1348 Final Weight/Volume: Injection Volume:

2 mL 1 uL

Analyte 1,4-Dioxane Result (ug/L)

Qualifier

DL 0.011

LOQ 0.10

Surrogate

0.030 %Rec

Qualifier

Acceptance Limits

2-Fluorophenol

98

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

Lab Sample ID: 580-75281-10

Date Sampled: 02/21/2018 1510 Client Matrix: Water Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date: 02/27/2018 2031 Prep Date:

02/26/2018 1348

Analysis Batch: Prep Batch:

580-268070 580-267977

Instrument ID: Lab File ID:

TAC050 022728a016.D

Initial Weight/Volume: 1054.7 mL Final Weight/Volume: 2 mL Injection Volume: 1 uL

Analyte Result (ug/L) Qualifier DL LOQ 1,4-Dioxane 0.028 U 0.010 0.095

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 98 53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-EB01-0218

Lab Sample ID:

580-75281-11

Client Matrix:

Water

Date Sampled: 02/21/2018 1650 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method:

3520C

Analysis Batch:

580-268070

Instrument ID:

TAC050

Dilution:

1.0

Prep Batch:

580-267977

Lab File ID:

Analysis Date:

Initial Weight/Volume: 992.8 mL

022728a017.D

Prep Date:

02/27/2018 2053

Final Weight/Volume: Injection Volume:

2 mL 1 uL

Analyte

Surrogate

02/26/2018 1348

Result (ug/L) Qualifier

DL

LOQ 0.10

1,4-Dioxane

0.030 %Rec

Qualifier

Acceptance Limits

2-Fluorophenol

88

53 - 106

0.011

TestAmerica Seattle

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DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800361

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-EB01-021918	1800361-01	Water
2	WI-A06-MW-13-0218	1800361-02	Water
3	WI-A06-FB01-022018	1800361-03	Water
4	WI-A06-6-DW-38A-0218	1800361-04	Water
5	WI-A06-EB01-022018	1800361-05	Water
6	WI-A06-6-S-27-0218	1800361-06	Water
7	WI-A06-6-S-28-0218	1800361-07	Water
8	WI-A06-FB01-022118	1800361-08	Water
9	WI-A06-MW-01-0218	1800361-09	Water
10	WI-A06-EB01-022118	1800361-10	Water

A full data validation was performed on the analytical data for five water samples, three aqueous equipment blank samples, and two aqueous field blank samples collected on February 19-21, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

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 except for the following.

EDS Sample	Date Sampled	Date Extracted	# of Days	Qualifier
All Samples*	02/19/18-02/21/18	03/17/18	24-26	UI

^{* -} Due to an oversight, the initial extraction did not contain PFDoA, therefore, all samples were re-extracted outside of holding times for this compound and qualified as estimated (UJ).

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-EB01-021918	None - ND		\$4/	u
WI-A06-EB01-022018	PFOA	1.32	U	4
WI-A06-EB01-022118	PFOA	0.931	U	9
WI-A06-FB01-022018	None - ND	623		2
WI-A06-FB01-022118	None - ND	7-	50	2

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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	%R	Qualifier
9	13C3-PFBS	163%	J

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 (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 5/15/1.8

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



HT

Sample ID: WI-A06-EB01	-021918								Mod	ified EPA Meth	nod 537
Client Data Name: CH2M Hill Project: NASWI Area Location: AREA 6	ı 6	Matrix: Date Colle	Aque	eous eb-18 16:45	Lab S	oratory Data Sample: Received:	1800361-0 23-Feb-18		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.92	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFHxA		ND	2.34	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFHpA		ND	0.635	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFHxS		ND	1.02	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFOA		ND	0.700	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFOS		ND	0.867	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFNA		ND	0.871	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFDA		ND	1.60	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
MeFOSAA		ND	1.77	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFUnA		ND	1.13	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
EtFOSAA		ND	1.47	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1.
PFDoA		NE LJ	0.849	5.34	8.57		B8C0101	17-Mar-18	0.117 L	17-Маг-18 20:54	Í
PFTrDA		ND	0.531	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
PFTeDA		ND	0.811	5.39	8.60		B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
Labeled Standards	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	98.5		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFHxA	IS	96.2		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C4-PFHpA	IS	94.0		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
18O2-PFHxS	IS	99.0		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	10
13C2-PFOA	IS	84.3		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C8-PFOS	IS	83.9		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
I3C5-PFNA	IS	75.0		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFDA	IS	71.3		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
d3-MeFOSAA	IS	77.4		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFUnA	IS	75.5		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
d5-EtFOSAA	IS	69.3		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1
13C2-PFDoA	IS	65.7		50 - 150			B8C0101	17-Mar-18	0.117 L	17-Mar-18 20:54	1
13C2-PFTeDA	IS	110		50 - 150			B8B0163	28-Feb-18	0.116 L	08-Mar-18 11:08	1

DL - Detection Limit

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

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7	hod 537	lified EPA Meth	Mod								218	VI-A06-MW-13-02	Sample ID: V
		: BEH C18	Column:		1800361-0 23-Feb-18	ratory Data ample: Received;	Lab S	eous Seb-18 11:10		Matrix: Date Colle		CH2M Hill NASWI Area 6 AREA 6	Client Data Name: Project: Location:
n	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)			Analyte
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	1.84	ND			PFBS
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	2.24	ND			PFHxA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	0.600	ND			PFHpA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	0.973	ND			PFHxS
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	0.668	ND			PFOA
	î	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	0.828	ND			PFOS
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	0.83	ND			PFNA
	Ĭ	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	1.53	ND			PFDA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	1.69	ND			MeFOSAA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	1.08	ND			PFUnA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	1.41	ND			EtFOSAA
	1	17-Mar-18 21:06	0.119 L	17-Mar-18	B8C0101		8.40	5.25	0.833	ND UJ			PFDoA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	0.50	ND			PFTrDA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163		8.21	5.12	0.775	ND			PFTeDA
n	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Type	rds	Labeled Standa
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		106	IS		13C3-PFBS
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		89.1	IS		13C2-PFHxA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		87.4	1S		13C4-PFHpA
	12	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		92.2	IS		18O2-PFHxS
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		95.7	IS		13C2-PFOA
	I	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		110	IS		13C8-PFOS
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		81.1	IS		13C5-PFNA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		83.1	IS		13C2-PFDA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		81.9	IS		d3-MeFOSAA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		87.3	IS		13C2-PFUnA
	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		92.0	IS		d5-EtFOSAA
	Ĭ.	17-Mar-18 21:06	0.119 L	17-Mar-18	B8C0101			50 - 150		85.1	IS		13C2-PFDoA
H,	1	08-Mar-18 11:19	0.122 L	28-Feb-18	B8B0163			50 - 150		103	IS		13C2-PFTeDA

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



od 537	lified EPA Meth	Modi								018	VI-A06-FB01-0220	Sample ID: V
	Column: BEH C18			Laboratory Data Lab Sample: 1800361-03 Date Received: 23-Feb-18 09:35				Matrix: Aqueous Date Collected: 20-Feb-18 11:25			lient Data lame: CH2M Hill roject: NASWI Area 6 ocation: AREA 6	
Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)			Analyte
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	1.84	ND			PFBS
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	2.24	ND			PFHxA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	0.606	ND			PFHpA
3	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	0.971	ND			PFHxS
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	0.667	ND			PFOA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	0.827	ND			PFOS
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	0.830	ND			PFNA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	1.53	ND			PFDA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	1.69	ND			MeFOSAA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	1.08	ND			PFUnA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	1.40	ND			EtFOSAA
1	17-Mar-18 21:17	0.123 L	17-Mar-18	B8C0101		8.13	5.08	0.805	Nous			PFDoA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	0.506	ND			PFTrDA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163		8.20	5.12	0.774	ND			PFTeDA
Dilution		Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Туре	rds	Labeled Standar
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		101	IS		13C3-PFBS
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		95.9	IS		13C2-PFHxA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		93.9	IS		13C4-PFHpA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		94.6	IS		18O2-PFHxS
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		93.2	IS		13C2-PFOA
Î	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		89.6	IS		13C8-PFOS
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		87.8	IS		13C5-PFNA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		79.7	IS		13C2-PFDA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		66.5	IS		d3-MeFOSAA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		63.4	IS		13C2-PFUnA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		62.1	IS		i5-EtFOSAA
Î	17-Mar-18 21:17	0.123 L	17-Mar-18	B8C0101			50 - 150		74.5	IS		13C2-PFDoA
1	08-Mar-18 11:31	0.122 L	28-Feb-18	B8B0163			50 - 150		78.2	IS		13C2-PFTeDA

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

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



ample ID: W	'I-A06-6-DW-38A-	-0218								Mod	ified EPA Metl	nod 537
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6 AREA 6		Matrix: Date Colle		gueous I-Feb-18 14:55	Lab	Sample: te Received:	1800361-0 23-Feb-18		Column	BEH C18	
nalyte			Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
FBS			2.74	1.87	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FHxA			15.7	2.28	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FHpA			1.70	0.617	5,21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FHxS			1.05	0.989	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	3
FOA			5.98 4	0.680	5.21	8.36	4	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FOS			2.77	0.843	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FNA			1.35	0.846	5.21	8.36	J	B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FDA			ND	1.56	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
eFOSAA			ND	1.72	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FUnA			ND	1.10	5,21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FOSAA			ND	1.43	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
DoA			D w ax	0.832	5.25	8.41		B8C0101	17-Mar-18	0.119 L	17-Mar-18 21:29	Î
TrDA			ND	0.516	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
FTeDA			ND	0.789	5.21	8.36		B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
abeled Standar	ds	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
C3-PFBS		IS	106		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
C2-PFHxA		IS	102		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	T
C4-PFHpA		1S	104		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
O2-PFHxS		IS	93.2		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
C2-PFOA		IS	81.2		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
C8-PFOS		IS	83.9		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
C5-PFNA		IS	81.5		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
C2-PFDA		IS	83.4		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
-MeFOSAA		IS	90.8		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
C2-PFUnA		IS	94.9		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
-EtFOSAA		IS	93.5		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	1
C2-PFDoA		IS	90.4		50 - 150			B8C0101	17-Mar-18	0.119 L	17-Mar-18 21:29	I
C2-PFTeDA		IS	105		50 - 150			B8B0163	28-Feb-18	0.120 L	08-Mar-18 11:42	Î

LOQ - Limit of quantitation

LOD - Limit of Detection

DL - Detection Limit

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

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Sample ID: WI-A06-F	EB01-022018								Mod	ified EPA Meth	10d 537
Client Data Name: CH2M I Project: NASWI Location: AREA	l Area 6	Matrix: Date Coll	Aque ected: 20-F	eous feb-18 17:00	Lab S	oratory Data Sample: Received:	1800361-0 23-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.85	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFHxA		ND	2.25	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFHpA		ND	0.611	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFHxS		ND	0.979	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFOA		1.32	0.673	5.17	8.27	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFOS		ND	0.834	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFNA		ND	0.837	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFDA		ND	1.54	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
MeFOSAA		ND	1.71	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFUnA		ND	1.09	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	I
EtFOSAA		ND	1.42	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
PFDoA		NOW	0.825	5.21	8.33		B8C0101	17-Mar-18	0.120 L	17-Mar-18 21:40	1 H
PFTrDA		ND	0.510	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	100
PFTeDA		ND	0.780	5.17	8.27		B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	97.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFHxA	IS	97.2		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C4-PFHpA	IS	90.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
18O2-PFHxS	IS	95.2		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	î
13C2-PFOA	IS	80.1		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C8-PFOS	IS	88.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C5-PFNA	IS	71.6		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFDA	IS	60.4		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
d3-MeFOSAA	IS	58.3		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFUnA	IS	61.6		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
d5-EtFOSAA	IS	62.1		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
13C2-PFDoA	IS	59.7		50 - 150			B8C0101	17-Mar-18	0.120 L	17-Mar-18 21:40	1
13C2-PFTeDA	IS	101		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 11:58	1
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL-	Lower control lin	nit - upper control limi	l	When rep	orted, PFHxS,	PFOA and PFOS	include both line	ar and branched isomer	5.

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

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



Sample ID: WI-A06-6-S-	-27-0218								Mod	ified EPA Meth	od 537
Client Data Name: CH2M Hill Project: NASWI An Location: AREA 6	ea 6	Matrix: Date Coll	1				1800361-06 Co 23-Feb-18 09:35		Column:	Column: BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		2.27	1.84	5.17	8.24	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFHxA		15.2	2.25	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFHpA		12.5	0.609	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFHxS		10.7	0.976	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFOA		35.6	0.671	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFOS		2.30	0.832	5.17	8.24	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFNA		ND	0.835	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFDA		ND	1.54	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
MeFOSAA		ND	1.70	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFUnA		ND	1.08	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	
EtFOSAA		ND	1.41	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFDoA		NDUJ	0.854	5.39	8.63		B8C0101	17-Mar-18	0.116 L	17-Mar-18 21:51	1
PFTrDA		ND	0.509	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
PFTeDA		ND	0.778	5.17	8.24		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	106		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFHxA	IS	92.4		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C4-PFHpA	1S	95.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
18O2-PFHxS	IS	96.7		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFOA	IS	84.0		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C8-PFOS	IS	108		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C5-PFNA	IS	75.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFDA	IS	75.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
d3-MeFOSAA	IS	82.0		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFUnA	IS	78.3		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
d5-EtFOSAA	IS	89.2		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1
13C2-PFDoA	IS	70.9		50 - 150			B8C0101	17-Mar-18	0.116 L	17-Mar-18 21:51	1
13C2-PFTeDA	IS	90.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:09	1

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

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



Sample ID: V	VI-A06-6-S-28-021	8								Mod	ified EPA Meth	hod 537
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6 AREA 6		Matrix: Date Colle	Aque ected; 21-Fe	ous b-18 11:15	Lab S	Fratory Data Sample: Received:	1800361-0 23-Feb-18		Column:	BEH C18	
Analyte			Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS			ND	1.85	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFHxA			ND	2.26	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFHpA			ND	0.611	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFHxS			ND	0.980	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFOA			ND	0.673	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFOS			1.69	0.835	5.17	8.28	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFNA			ND	0.838	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFDA			ND	1.54	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
MeFOSAA			ND	1.71	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFUnA			ND	1.09	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
EtFOSAA			ND	1.42	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFDoA			NO MJ	0.902	5.68	9.11		B8C0101	17-Mar-18	0.110 L	17-Mar-18 22:03	1
PFTrDA			ND	0.511	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
PFTeDA			ND	0.781	5.17	8.28		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
Labeled Standa	rds	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS		IS	96.1		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFHxA		IS	86.0		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C4-PFHpA		IS	95.6		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
18O2-PFHxS		IS	81.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFOA		IS	83.4		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C8-PFOS		IS	81.1		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	Ī
13C5-PFNA		IS	74.4		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFDA		1S	75.4		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
d3-MeFOSAA		IS	83.1		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFUnA		1S	90.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
d5-EtFOSAA		IS	86.6		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1
13C2-PFDoA		IS	77.6		50 - 150			B8C0101	17-Mar-18	0.110 L	17-Mar-18 22:03	1
13C2-PFTeDA		IS	96.4		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:21	1

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

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

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Work Order 1800361



Sample ID: WI-A06-FB01-022118 Modified EPA Method 537												
	BEH C18	Column:		1800361-0 23-Feb-18	ratory Data ample: Received:	Lab Sa	ous b-18 15:00	Aque cted: 21-Fe	Matrix: Date Colle		CH2M Hill NASWI Area 6 AREA 6	Client Data Name: Project: Location:
Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)			Analyte
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	1.90	ND			PFBS
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	2.31	ND			PFHxA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	0.627	ND			PFHpA
31	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	1.01	ND			PFHxS
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	0.691	ND			PFOA
ï	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	0.856	ND			PFOS
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	0.860	ND			PFNA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	1.58	ND			PFDA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	1.75	ND			MeFOSAA
4	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	1.11	ND			PFUnA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	1.45	ND			EtFOSAA
ī	17-Mar-18 22:14	0.121 L	17-Mar-18	B8C0101		8.30	5.17	0.822	NO UJ			PFDoA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	0.524	ND			PFTrDA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163		8.49	5.30	0.801	ND			PFTeDA
Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Туре	rds	Labeled Standa
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		101	IS		3C3-PFBS
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		94.7	IS		13C2-PFHxA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		89.8	IS		13C4-PFHpA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		90.1	IS		18O2-PFHxS
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		81.7	IS		13C2-PFOA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		82.9	IS		13C8-PFOS
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		88.6	IS		13C5-PFNA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		64.5	IS		13C2-PFDA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		74.3	IS		13-MeFOSAA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		71.1	IS		I3C2-PFUnA
1	13-Mar-18 02:36		28-Feb-18	B8B0163			50 - 150		71.4	IS		d5-EtFOSAA
I	17-Mar-18 22:14	0.121 L	17-Mar-18	B8C0101			50 - 150		59.3	IS		13C2-PFDoA
1	13-Mar-18 02:36	0.118 L	28-Feb-18	B8B0163			50 - 150		60.5	IS		13C2-PFTeDA

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

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



Sample ID: WI-A06-MW-01-0218 Modified EPA Method 537											
Client Data Name: CH2M Project: NASW Location: AREA	/l Area 6	Matrix: Date Coll		ueous Feb-18 15:10	Lab	oratory Data Sample: Received:	1800361-0 23-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		62.5 J	1.85	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
PFHxA		111	2.26	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
PFHpA		22.3	0.612	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
PFHxS		16.6	0.981	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
PFOA		6.09 M	0.675	5.17	8.29	1	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
PFOS		ND	0.836	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
PFNA		ND	0,839	5,17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
PFDA		ND	1.54	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
MeFOSAA		ND	1.71	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
PFUnA		ND	1.09	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
EIFOSAA		ND	1.42	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
PFDoA		LN CK	0.836	5.30	8.45		B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:26	5 1
PFTrDA		ND	0.512	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
PFTeDA		ND	0.782	5.17	8.29		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3 1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	163		50 - 150		H	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C2-PFHxA	IS	93.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C4-PFHpA	1S	106		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
18O2-PFHxS	IS	89.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	3
13C2-PFOA	IS	94.1		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C8-PFOS	IS	89.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	Ĭ
13C5-PFNA	IS	83.0		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
13C2-PFDA	IS	75.2		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
d3-MeFOSAA	IS	84.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
13C2-PFUnA	IS	77.7		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	
d5-EtFOSAA	IS	94.7		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
13C2-PFDoA	IS	68.2		50 - 150			B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:26	1
13C2-PFTeDA	IS	94.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:43	1
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL-	Lower control I	imit - upper control limit	-	When rep	oorted, PFHxS,	PFOA and PFOS	include both line	car and branched isome	PTN

renslizli8

Results reported to the DL.

LOQ - Limit of quantitation

Only the linear isomer is reported for all other analytes.



Sample ID: V	VI-A06-EB01-02	22118								Mod	ified EPA Met	hod 537
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6 AREA 6		Matrix: Date Colle		queous 1-Feb-18 16:50	Lab S	oratory Data Sample: Received:	1800361- 23-Feb-18		Column	: ВЕН С18	
Analyte			Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS			ND	1.84	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFHxA			ND	2.24	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFHpA			ND	0.608	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	
PFHxS			ND	0.975	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	4
PFOA			0.931	0.670	5.17	8.23	J	B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFOS			ND	0.831	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	
PFNA			ND	0.834	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFDA			ND	1.53	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	
MeFOSAA			ND	1.70	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFUnA			ND	1.08	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	
EtFOSAA			ND	1.41	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFDoA			NOUJ	0.838	5.30	8.47		B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:37	1
PFTrDA			ND	0.508	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
PFTeDA			ND	0.777	5.17	8.23		B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
Labeled Standar	rds	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS		IS	101		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFHxA		IS	95.4		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C4-PFHpA		IS	99.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
18O2-PFHxS		lS	93.7		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFOA		IS	96.8		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C8-PFOS		IS	99.7		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	I
13C5-PFNA		IS	86.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFDA		IS	85.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
d3-MeFOSAA		IS	70.9		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFUnA		IS	63.7		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	
d5-EtFOSAA		IS	70.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
13C2-PFDoA		IS	70.6		50 - 150			B8C0101	17-Mar-18	0.118 L	17-Mar-18 22:37	1
13C2-PFTeDA		IS	70.5		50 - 150			B8B0163	28-Feb-18	0.121 L	08-Mar-18 12:55	1
DL - Detection Limi	it	LOD - Limit of Detection	LCL-UCL- L	ower contro	l limit - upper control limit		When rep	orted, PFHxS,	PFOA and PFOS	include both line	ear and branched isomer	rs.

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit Results reported to the DL.

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-75202-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1*	WI-A06-TB01-021618	580-75202-1	Water
2	WI-A06-MW-06-0218	580-75202-2	Water
3	WI-A06-EB01-021618	580-75202-3	Water
4	WI-A06-S-01-0218	580-75202-4	Water
4MS*	WI-A06-S-01-0218MS	580-75202-4MS	Water
4MSD*	WI-A06-S-01-0218MSD	580-75202-4MSD	Water
5	WI-A06-S-01P-0218	580-75202-5	Water

^{* -} VOC only

A full data validation was performed on the analytical data for three water samples, one aqueous equipment blank sample, and one aqueous trip blank sample collected on February 16-19, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-021618	None - ND	-	-	15
WI-A06-EB01-021618	None - ND	1#1	5	15

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate recoveries.

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

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

Laboratory Control Samples

• 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 results are summarized below.

Compound	WI-A06-S-01-0218 ug/L	WI-A06-S-01P-0218 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND	=	(1)

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC samples were not analyzed.

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

Sample ID	Surrogate	%R	Qualifier
2	2-Fluorophenol	107%	None - Sample ND
3	2-Fluorophenol	107%	None - Sample ND

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

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 results are summarized below.

Compound	WI-A06-S-01-0218 ug/L	WI-A06-S-01P-0218 ug/L	RPD	Qualifier
1,4-Dioxane	ND	ND		(#)

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information. Mancy Weaver Dated: 5/15/18

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-TB01-021618

Lab Sample ID: 580-75202-1 Date Sampled: 02/16/2018 0800 **Client Matrix:** Water Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: 02/21/2018 1602

Prep Date: 02/21/2018 1602

Analysis Batch: 580-267774 Instrument ID: **TAC036** Prep Batch: N/A Lab File ID: 022118_08.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Qualifier Result (ug/L) DL LOQ Vinyl chloride 0.040 UŊ 0.013 0.50

%Rec

Surrogate Qualifier **Acceptance Limits** 97 Trifluorotoluene (Surr) 80 - 141 Dibromofluoromethane (Surr) 98 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-MW-06-0218

Lab Sample ID: 580-75202-2

Client Matrix: Water

Date Sampled: 02/16/2018 1440 Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:

8260C SIM

Analysis Batch:

580-267774

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

Lab File ID:

Dilution:

1.0

N/A

Initial Weight/Volume: 5 mL

022118_09.D

Analysis Date:

02/21/2018 1626

Final Weight/Volume: 5 mL

Prep Date: Analyte

Vinyl chloride

02/21/2018 1626

Result (ug/L) 0.040

Qualifier UM

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

%Rec 97 98

Qualifier

M

Acceptance Limits 80 - 141

Client: CH2M Hill, Inc.

Job Number: 580-75202-1

Client Sample ID:

W1-A06-EB01-021618

Lab Sample ID:

Client Matrix: Water

580-75202-3

Date Sampled: 02/16/2018 1630 Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:

8260C SIM

Analysis Batch:

580-267774

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

N/A

Lab File ID:

022118_10.D

Dilution:

1.0

02/21/2018 1649

Analysis Date: Prep Date:

02/21/2018 1649

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte

DL

LOQ

Vinyl chloride

Result (ug/L) 0.040

Qualifier

0.013

0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr) %Rec 96

98

Qualifier

Acceptance Limits 80 - 141 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01-0218

> 580-75202-4 Date Sampled: 02/19/2018 1200 Water Date Received: 02/20/2018 0950

> > 8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Lab Sample ID:

Client Matrix:

Analysis Date: 02/21/2018 1713

Prep Date: 02/21/2018 1713 Analysis Batch: Prep Batch: N/A

580-267774

Instrument ID: Lab File ID:

TAC036 022118_11.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 UW 0.013 0.50

Surrogate %Rec Qualifier **Acceptance Limits** Trifluorotoluene (Surr) 97 80 - 141 Dibromofluoromethane (Surr) 98 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01P-0218

Lab Sample ID: 580-75202-5

Client Matrix: Water Date Sampled: 02/19/2018 1210 Date Received: 02/20/2018 0950

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Prep Method: 5030B Dilution:

1.0

Analysis Date:

02/21/2018 1823 Prep Date:

02/21/2018 1823

Analysis Batch: Prep Batch:

580-267774

N/A

Instrument ID:

TAC036 Lab File ID: 022118_14.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 ÚΜ 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 97 80 - 141 Dibromofluoromethane (Surr) M 98 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-MW-06-0218

Date Sampled: 02/16/2018 1440

Lab Sample ID: Client Matrix:

580-75202-2

Water Date Received: 02/20/2018 0950

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Analysis Batch: Prep Batch: 580-267832

580-268210

Instrument ID: Lab File ID:

TAC050 030118a020.D

Dilution: 1.0 Analysis Date:

03/01/2018 2252

Initial Weight/Volume: 1017.6 mL Final Weight/Volume: 2 mL Injection Volume:

Prep Date: Analyte

02/22/2018 1441

Result (ug/L) Qualifier υJ

DL 0.011

LOQ 0.098

1,4-Dioxane

Surrogate

0.029

Acceptance Limits

2-Fluorophenol

%Rec 107

Qualifier

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-EB01-021618

Date Sampled: 02/16/2018 1630

Lab Sample ID: 580-75202-3 Client Matrix:

Water

Date Received: 02/20/2018 0950

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Analysis Batch:

580-268210

Instrument ID: Lab File ID:

TAC050 030118a021.D

Dilution:

1.0

Prep Batch: 580-267832

Initial Weight/Volume: 934.2 mL

Analysis Date: Prep Date:

03/01/2018 2314 02/22/2018 1441

Final Weight/Volume: Injection Volume:

Analyte 1,4-Dioxane Result (ug/L) 0.032

Qualifier U 🎝

DL 0.012 LOQ 0.11

Surrogate

%Rec 107

Qualifier

Acceptance Limits

2-Fluorophenol

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01-0218

Lab Sample ID: 580-75202-4

Client Matrix: Water Date Sampled: 02/19/2018 1200 Date Received: 02/20/2018 0950

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C Dilution:

1.0

Analysis Date:

03/01/2018 2336 Prep Date: 02/22/2018 1441 Analysis Batch: Prep Batch:

580-268210

580-267832

Instrument ID: Lab File ID:

TAC050 030118a022.D Initial Weight/Volume: 1047.6 mL

Final Weight/Volume: 2 mL Injection Volume:

Analyte

Result (ug/L) 0.029

Qualifier U

DL 0.011 LOQ 0.095

1,4-Dioxane Surrogate

%Rec 98

Qualifier

Acceptance Limits

2-Fluorophenol

53 - 106

TAC050

030118a023.D

Client: CH2M Hill, Inc. Job Number: 580-75202-1

Client Sample ID: W1-A06-S-01P-0218

Lab Sample ID: 580-75202-5

Date Sampled: 02/19/2018 1210 Client Matrix: Water Date Received: 02/20/2018 0950

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Analysis Batch: 580-268210 Instrument ID: Prep Method: 3520C Prep Batch: 580-267832 Lab File ID:

Dilution: 1.0 Initial Weight/Volume: 982.2 mL Analysis Date: 03/01/2018 2358 Final Weight/Volume: 2 mL Prep Date: 02/22/2018 1441 Injection Volume: 1 uL

Analyte Result (ug/L) Qualifier ÐL LOQ 1,4-Dioxane 0.031 U 0.011 0.10

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 95 53 - 106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800339

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-MW-06-0218	1800339-01	Water
2	WI-A06-FB01-021618	1800339-02	Water
3	WI-A06-EB01-021618	1800339-03	Water
4	WI-A06-S-01-0218	1800339-04	Water
4MS	WI-A06-S-01-0218MS	1800339-04MS	Water
4MSD	WI-A06-S-01-0218MSD	1800339-04MSD	Water
5	WI-A06-S-01P-0218	1800339-05	Water
6	WI-A06-FB01-021918	1800339-06	Water

A full data validation was performed on the analytical data for three water samples, one aqueous equipment blank sample, and two aqueous field blanks sample collected on February 16-19, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

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.

GC/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 exhibited the following contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
B8B0129-BLK1	PFHxS	1.76	U	1, 2, 3, 4, 5

Field QC Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ng/L		
WI-A06-FB01-021618	None - ND	:#.;		*
WI-A06-EB01-021618	None - ND	(4)	9	=
WI-A06-FB01-021918	None - ND	:40	e	2

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

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

Laboratory Control Samples

• The LCS samples exhibited acceptable percent recoveries (%R) except for the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
B8B1029-BS1	MeFOSAA	133%	None	All Associated ND

Internal Standard (IS) Area Performance

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

EDS Sample	Internal Standard	%R	Qualifier
6	d3-MeFOSAA	49.5%	UJ

Target Compound Identification

All mass spectra and quantitation criteria were met.

Compound Quantitation

All criteria were met.

Field Duplicate Sample Precision

Field duplicate results are summarized below. The precision was acceptable.

	×	PFCs		
Compound	WI-A06-S-01-0218 ng/L	WI-A06-S-01P-0218 ng/L	RPD	Qualifier
None	ND	ND		120

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information. Mancy Weaver Dated: 5/15/18

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: WI-A06-EB01	-021618								Mod	ified EPA Metl	hod 537	
Client Data					Lab	oratory Data						
Name: CH2M Hill		Matrix:	Aq	ueous	Lab	Sample:	1800339-0	03	Column	BEH C18		
Project: 695610.05.FI.	.FS	Date Coll		-Feb-18 16:30		Received:	20-Feb-18	09:04	Column	DETICIO		
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS		ND	1.85	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFHxA		ND	2.25	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFHpA		ND	0.609	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFHxS		5.17 HATU	0.977	5.17	8.25	J, B	B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFOA		ND	0.671	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFOS		ND	0.832	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23		
PFNA		ND	0.835	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23		
PFDA		ND	1.54	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
MeFOSAA		ND	1.70	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23		
PFUnA		ND	1.08	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23		
EtFOSAA		ND	1.41	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFDoA		ND	0.817	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFTrDA		ND	0.509	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
PFTeDA		ND	0.779	5.17	8.25		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
Labeled Standards	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution	
13C3-PFBS	IS	117		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFHxA	IS	87.8		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
I3C4-PFHpA	IS	96.5		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
18O2-PFHxS	IS	83.9		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFOA	IS	80.6		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C8-PFOS	IS	72.6		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C5-PFNA	IS	64.8		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
I3C2-PFDA	IS	68.6		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
d3-MeFOSAA	IS	74.9		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFUnA	IS	81.2		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
d5-EtFOSAA	IS	78.7		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	1	
13C2-PFDoA	IS	76.3		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	Ī	
13C2-PFTeDA	IS	72.4		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:23	10	

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



Sample ID: WI-A06-MW-06-	0218								Mod	lified EPA Metl	hod 537
Client Data Name: CH2M Hill Project: 695610.05.FI.FS		Matrix: Date Coll		Aqueous 16-Feb-18 14:40	Lab	pratory Data Sample: Received:	1800339-(20-Feb-18		Column	Column: BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.89	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFHxA		ND	2.30		8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFHpA		ND	0.624		8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFHxS		5.30 3.70 W	0.999		8.44	J-B	B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFOA		ND	0.687		8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFOS		ND	0.852		8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFNA		ND	0.855		8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFDA		ND	1.57	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
MeFOSAA		ND	1.74		8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFUnA		ND	1.11	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
EtFOSAA		ND	1.45	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFDoA		ND	0.836	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
PFTrDA		ND	0.521	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
PFTeDA		ND	0.797	5.30	8.44		B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	107		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFHxA	IS	82.4		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
I3C4-PFHpA	IS	89.1		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	
18O2-PFHxS	IS	71.8		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFOA	IS	78.9		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C8-PFOS	IS	86.1		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	L
13C5-PFNA	IS	73.2		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFDA	IS	77.8		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
i3-MeFOSAA	IS	84.4		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFUnA	IS	82.6		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	.1
d5-EtFOSAA	IS	85.6		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFDoA	IS	96.8		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1
13C2-PFTeDA	IS	93.1		50 - 150			B8B0129	26-Feb-18	0.118 L	01-Mar-18 04:00	1

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

Only the linear isomer is reported for all other analytes.



hod 537	ified EPA Meth	Mod								18	VI-A06-FB01-0216	Sample ID: V
	: ВЕН С18	Column:		1800339-0 20-Feb-18	ratory Data ample: Received:	Lab S	ous b-18 14:45	Aqu ted: 16-1	Matrix: Date Collec		CH2M Hill 695610.05.F1.FS	Client Data Name: Project:
Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)			Analyte
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	1.84	ND			PFBS
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	2.24	ND			PFHxA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	0.607	ND			PFHpA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129	1,13	8.22	5.12	0.973	12 1.89 U			PFHxS
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129	C ANALYTICS	8.22	5.12	0.669	ND			PFOA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	0.829	ND			PFOS
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	0.832	ND			PFNA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	1.53	ND			PFDA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	1.70	ND			MeFOSAA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	1.08	ND			PFUnA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	1.41	ND			EtFOSAA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	0.814	ND			PFDoA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	0.508	ND			PFTrDA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129		8.22	5.12	0.776	ND			PFTeDA
Dilution		Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Туре	rds	Labeled Standar
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		105	IS		13C3-PFBS
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		90.7	IS		13C2-PFHxA
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		94.6	IS		13C4-PFHpA
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		78.9	IS		18O2-PFHxS
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		81.4	IS		13C2-PFOA
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		74.2	IS		13C8-PFOS
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		71.3	IS		13C5-PFNA
	01-Маг-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		65.4	IS		13C2-PFDA
	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		58.4	IS		d3-MeFOSAA
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		73.4	IS		13C2-PFUnA
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		75.6	IS		d5-EtFOSAA
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		58.4	IS		13C2-PFDoA
1	01-Mar-18 04:12	0.122 L	26-Feb-18	B8B0129			50 - 150		71.7	IS		13C2-PFTeDA

LOQ - Limit of quantitation

LOD - Limit of Detection

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

NW Slizh 8

DL - Detection Limit



Sample ID: WI	I-A06-S-01-0218									Mod	ified EPA Metl	hod 537
Client Data							oratory Data					
	CH2M Hill		Matrix:		ueous		Sample:	1800339-0		Column	BEH C18	
Project:	695610.05.FI.FS		Date Coll	ected: 19-	-Feb-18 12:00	Date	e Received:	20-Feb-18	09:04			
Analyte			Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS			ND	1.84	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFHxA			ND	2.24	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	Ī
PFHpA			ND	0.608	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFHxS			5.17 HAT U		5.17	8.24	LB	B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	
PFOA			ND	0.670	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFOS			ND	0.831	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	
PFNA			ND	0.834	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFDA			ND	1.53	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
MeFOSAA			ND	1.70	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFUnA			ND	1.08	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
EtFOSAA			ND	1.41	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFDoA			ND	0.815	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFTrDA			ND	0.509	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
PFTeDA			ND	0.777	5.17	8.24		B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
Labeled Standard	ls	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS		IS	107		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFHxA		IS	89.5		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C4-PFHpA		IS	82.8		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
18O2-PFHxS		IS	80.7		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFOA		IS	77.0		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C8-PFOS		IS	70.6		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	E
13C5-PFNA		IS	82.0		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFDA		IS	68.7		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
d3-MeFOSAA		IS	75.4		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFUnA		IS	80.9		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
d5-EtFOSAA		IS	92.3		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFDoA		IS	78.6		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1
13C2-PFTeDA		IS	87.3		50 - 150			B8B0129	26-Feb-18	0.121 L	01-Mar-18 04:35	1

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

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

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37	hod 537	lified EPA Meth	Mod								8	WI-A06-S-01P-0218	Sample ID: V
					ratory Data							Client Data	
		: BEH C18	Column:		1800339-0	ample:			Aqu	Matrix:		CH2M Hill	Name:
				09:04	20-Feb-18	Received:	Date	ь-18 12:10	ected: 19-1	Date Colle		695610.05.Fl.FS	Project:
on	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)			Analyte
\neg	- 1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	1.84	ND			PFBS
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	2.24	ND			PFHxA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	0.606	ND			PFHpA
	- 1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129	J.B	8.21	5.12	0.972	5.12 2.14 U			PFHxS
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	0.668	ND			PFOA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	0.828	ND			PFOS
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	0.831	ND			PFNA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	1.53	ND			PFDA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	1.69	ND			MeFOSAA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	1.08	ND			PFUnA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	1.41	ND			EtFOSAA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	0.813	ND			PFDoA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	0.507	ND			PFTrDA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129		8.21	5.12	0.775	ND			PFTeDA
o n	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Type	ards	Labeled Standa
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		127	IS		13C3-PFBS
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		97.2	IS		13C2-PFHxA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		115	1S		13C4-PFHpA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		95.5	IS		18O2-PFHxS
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		89.4	IS		13C2-PFOA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		85.1	IS		13C8-PFOS
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		79.2	IS		13C5-PFNA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		70.5	IS		13C2-PFDA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		68.3	IS		d3-MeFOSAA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		80.8	IS		13C2-PFUnA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		77.0	IS		d5-EtFOSAA
	I	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129			50 - 150		72.0	IS		13C2-PFDoA
	1	01-Mar-18 04:46	0.122 L	26-Feb-18	B8B0129	- 0		50 - 150		102	IS		13C2-PFTeDA

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

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Sample ID: WI-	-A06-FB01-02191	8								Mod	ified EPA Metl	od 537
	CH2M Hill 695610.05.Fl.FS		Matrix: Date Colle		queous 9-Feb-18 13:00	Lab	oratory Data Sample: Received:	1800339-(20-Feb-18		Column:	BEH C18	
Analyte			Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS			ND	1.83	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFHxA			ND	2.23	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFHpA			ND	0.604	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFHxS			ND	0.969	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFOA			ND	0.666	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFOS			ND	0.825	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFNA			ND	0.828	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFDA			ND	1.52	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
MeFOSAA			NOUJ	1.69	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFUnA			ND	1.07	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
EtFOSAA			ND	1.40	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFDoA			ND	0.810	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFTrDA			ND	0.505	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
PFTeDA			ND	0.772	5.12	8.18		B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
Labeled Standards		Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS		IS	98.1		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFHxA		IS	84.2		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C4-PFHpA		IS	81.1		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
18O2-PFHxS		IS	84.3		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFOA		IS	82.5		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	- 1
13C8-PFOS		IS	85.8		50 = 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C5-PFNA		IS	70.3		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFDA		IS	57.4		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
d3-MeFOSAA		IS	49.5		50 - 150		Ж	B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFUnA		IS	52.1		50 = 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
d5-EtFOSAA		IS	60.0		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFDoA		IS	67.3		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1
13C2-PFTeDA		IS	74.0		50 - 150			B8B0129	26-Feb-18	0.122 L	01-Mar-18 04:58	1

LOD - Limit of Detection

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

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

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DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-75341-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-EB01-022218	580-75341-1	Water
2	WI-A06-MW03B-0218	580-75341-2	Water
3	WI-A06-EB01-022318	580-75341-3	Water
4	WI-A06-6-S-02-0218	580-75341-4	Water
5	WI-A06-6-S-05-0218	580-75341-5	Water
6	WI-A06-6-S-05P-0218	580-75341-6	Water
7*	WI-A06-TB01-022218	580-75341-7	Water

^{* -} VOC only

A full data validation was performed on the analytical data for four water samples, two aqueous equipment blank samples, and one aqueous trip blank sample collected on February 22-23, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

<u>Analysis</u> <u>Method References</u>

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-022218	None - ND		-	
WI-A06-EB01-022318	None - ND		-	
WI-A06-TB01-022218	None - ND	S73	-	-

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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

• The MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below.

Compound	WI-A06-6-S-05-0218 ug/L	WI-A06-6-S-05P-0218 ug/L	RPD	Qualifier
None	ND	ND	-	

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-022218	None - ND	196	14	=
WI-A06-EB01-022318	None - ND	(#2		=

Surrogate Spike Recoveries

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

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

• The MS/MSD samples were not analyzed.

Laboratory Control Samples

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 results are summarized below.

Compound	WI-A06-6-S-05-0218 ug/L	WI-A06-6-S-05P-0218 ug/L	RPD	Qualifier
None	ND	ND		S#6

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: Slisli8

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low,
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-EB01-022218

Lab Sample ID: 580-75341-1

Client Matrix: Water Date Sampled: 02/22/2018 1550 Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: Prep Date:

03/01/2018 1953

03/01/2018 1953

Analysis Batch: Prep Batch:

580-268193 N/A

Instrument ID:

Lab File ID:

TAC036 030118_19.D

Initial Weight/Volume: 5 mL Final Weight/Volume:

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

%Rec Surrogate Qualifier Acceptance Limits Trifluorotoluene (Surr) 97 80 - 141 Dibromofluoromethane (Surr) 100 M 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID:

WI-A06-MW03B-0218

Lab Sample ID:

580-75341-2

Client Matrix:

Water

Date Sampled: 02/22/2018 1500 Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-268193

Instrument ID:

TAC036

Prep Method: Dilution:

5030B 1.0

Prep Batch:

0.040

100

Lab File ID:

030118_20.D

N/A

Initial Weight/Volume: 5 mL

Analysis Date:

03/01/2018 2017

Final Weight/Volume:

Prep Date:

Vinyl chloride

03/01/2018 2017

Result (ug/L)

DL 0.013

LOQ 0.50

Surrogate

Analyte

%Rec 98

Qualifier

Qualifier

Acceptance Limits 80 - 141

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

M

U

77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID:

WI-A06-EB01-022318

Lab Sample ID:

580-75341-3

Client Matrix: Water

Date Sampled: 02/23/2018 1500

Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:

8260C SIM

Analysis Batch:

580-268193

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

Lab File ID:

Dilution:

1.0

N/A

030118_21.D

Analysis Date: Prep Date:

Initial Weight/Volume: 5 mL

03/01/2018 2040 03/01/2018 2040

Final Weight/Volume: 5 mL

Analyte Vinyl chloride

Result (ug/L) 0.040

Qualifier

Qualifier

DL 0.013

LOQ 0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

%Rec 97 99

M

U

80 - 141 77 - 118

Acceptance Limits

TAC036

030118_22.D

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-02-0218

Lab Sample ID:

Client Matrix:

580-75341-4 Date Sampled: 02/23/2018 1355 Water Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

N/A

580-268193

Instrument ID:

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Lab File ID:

Analysis Method: 8260C SIM Analysis Batch: Prep Method: 5030B Prep Batch:

Dilution: 1.0

Analysis Date: 03/01/2018 2104

Prep Date: 03/01/2018 2104

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 U 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 98 80 - 141 M Dibromofluoromethane (Surr) 100 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-05-0218

Lab Sample ID:

580-75341-5

Client Matrix: Water

Date Sampled: 02/23/2018 1035 Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method:

5030B 1.0

Dilution: Analysis Date: Prep Date:

03/01/2018 2128

03/01/2018 2128

Analysis Batch: Prep Batch: N/A

580-268193

Instrument ID: Lab File ID:

TAC036 030118_23.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Vinyl chloride

Result (ug/L) 0.040

Qualifier U

Qualifier

DL 0.013

LOQ 0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

%Rec 98 99

M

80 - 141 77 - 118

Acceptance Limits

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-05P-0218

> Date Sampled: 02/23/2018 1035 Date Received: 02/27/2018 0925

Lab Sample ID: Client Matrix:

580-75341-6

Water

8260C SIM Volatile Organic Compounds (GC/MS)

8260C SIM Analysis Batch: 5030B

580-268193

Instrument ID:

TAC036

Prep Method: Dilution:

Analysis Method:

1.0

Prep Batch:

N/A

Lab File ID: Initial Weight/Volume: 5 mL

030118_24.D

Analysis Date:

03/01/2018 2151

Final Weight/Volume: 5 mL

Prep Date:

03/01/2018 2151

Result (ug/L) Qualifier 0.040

DL 0.013 LOQ 0.50

Vinyl chloride

Surrogate

Analyte

%Rec 97

101

Qualifier

U

Acceptance Limits

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

80 - 141 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-TB01-022218

Lab Sample ID:

580-75341-7

Client Matrix: Water Date Sampled: 02/22/2018 0700 Date Received: 02/27/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: Prep Method:

8260C SIM 5030B

1.0

Analysis Date: Prep Date:

03/01/2018 2215

03/01/2018 2215

Analysis Batch: 580-268193 Prep Batch:

N/A

Instrument ID: Lab File ID:

TAC036 030118_25.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Vinyl chloride

Dilution:

Result (ug/L) 0.040

%Rec

97

102

Qualifier U

Qualifier

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

80 - 141 77 - 118

Acceptance Limits

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-EB01-022218

Lab Sample ID: 580-75341-1

Client Matrix: Water Date Sampled: 02/22/2018 1550 Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution:

1.0

Analysis Date: Prep Date:

03/01/2018 1910 02/27/2018 1425 Analysis Batch: Prep Batch:

580-268210

580-268061

Instrument ID: Lab File ID:

TAC050 030118a010.D

Initial Weight/Volume: 1027.6 mL Final Weight/Volume: 2 mL

Injection Volume: 1 uL

Analyte Result (ug/L) Qualifier DL LOQ 1,4-Dioxane 0.029 U 0.011 0.097

Surrogate %Rec Qualifier Acceptance Limits

2-Fluorophenol 94 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-MW03B-0218

Lab Sample ID: 580-75341-2

Client Matrix: Water

2

Date Sampled: 02/22/2018 1500 Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Analysis Batch: 580-268210 Instrument ID:

Prep Method: 3520C Dilution: 1.0

Analysis Date: 03/01/2018 1932 Prep Date: 02/27/2018 1425 Prep Batch: 580-268061

Instrument ID: Lab File ID: TAC050 030118a011.D

Initial Weight/Volume: 1009.9 mL Final Weight/Volume: 2 mL Injection Volume: 1 uL

 Analyte
 Result (ug/L)
 Qualifier
 DL
 LOQ

 1,4-Dioxane
 0.030
 U
 0.011
 0.099

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 95 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-EB01-022318

Lab Sample ID: Client Matrix:

580-75341-3

nt Matrix: Water

00b (4dffbcf. 500-7554)-

3

Date Sampled: 02/23/2018 1500 Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM 3520C Analysis Batch:

580-268210

Instrument ID:

TAC050

Prep Method: Dilution: Analysis Date:

1.0

Prep Batch: 580-268061

0-268061 Lab File ID:

Lab File ID: 030118a012.D Initial Weight/Volume: 1040.2 mL

Final Weight/Volume: 2 mL Injection Volume: 1 uL

Analyte

Prep Date:

03/01/2018 1955 02/27/2018 1425

> Result (ug/L) 0.029

Qualifier

DL 0.011 LOQ 0.096

1,4-Dioxane
Surrogate

%Rec

Qualifier

U

Acceptance Limits

2-Fluorophenol

87

53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-75341-1

Client Sample ID:

WI-A06-6-S-02-0218

Lab Sample ID:

580-75341-4

Client Matrix:

Water

Date Sampled: 02/23/2018 1355 Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-268210

Instrument ID:

TAC050

Prep Method:

3520C

Lab File ID:

Dilution:

Prep Batch:

580-268061

030118a013.D

1.0

Initial Weight/Volume: 1022.9 mL

Analysis Date: Prep Date:

03/01/2018 2017

Final Weight/Volume: Injection Volume:

2 mL 1 uL

Analyte

02/27/2018 1425

Result (ug/L) Qualifier

U

DL 0.011

LOQ 0.098

1,4-Dioxane Surrogate

0.029 %Rec

Qualifier

Acceptance Limits

2-Fluorophenol

87

53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-05-0218

Lab Sample ID: Client Matrix:

580-75341-5

Water

Date Sampled: 02/23/2018 1035 Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: Prep Method:

8270D SIM 3520C

Analysis Batch: Prep Batch:

580-268210

Instrument ID: Lab File ID:

TAC050 030118a014.D

Dilution: Analysis Date:

1.0 03/01/2018 2039

580-268061

Initial Weight/Volume: 1030.3 mL Final Weight/Volume: 2 mL

Injection Volume:

53 - 106

Analyte 1,4-Dioxane

Prep Date:

02/27/2018 1425

Result (ug/L) 0.029

Qualifier

DL 0.011 LOQ 0.097

Surrogate

%Rec 94

Qualifier

Acceptance Limits

2-Fluorophenol

Client: CH2M Hill, Inc. Job Number: 580-75341-1

Client Sample ID: WI-A06-6-S-05P-0218

580-75341-6

Lab Sample ID: Client Matrix:

Water

Date Sampled: 02/23/2018 1035 Date Received: 02/27/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: Prep Method:

8270D SIM 3520C

Analysis Batch:

580-268210

Instrument ID:

TAC050

Dilution:

Prep Batch:

580-268061

Lab File ID:

030118a015.D

Analysis Date:

1.0

Initial Weight/Volume:

943.5 mL

Prep Date:

03/01/2018 2101

Final Weight/Volume: Injection Volume:

2 mL 1 uL

02/27/2018 1425

Result (ug/L)

Qualifier

DL 0.012 LOQ 0.11

Analyte 1,4-Dioxane

Surrogate

0.032

Qualifier

Acceptance Limits

2-Fluorophenol

%Rec 89

53 - 106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800367

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

PFCs						
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix			
1	WI-A06-EB01-0218	1800367-01	Water			
2	WI-A06-MW03B-0218	1800367-02	Water			
3	WI-A06-FB01-022218	1800367-02	Water			
4	WI-A06-S-02-0218	1800367-03	Water			
5	WI-A06-6-S-05-0218	1800367-04	Water			
6	WI-A06-6-S-05P-0218	1800367-05	Water			
7	WI-A06-FB01-022318	1800367-06	Water			
8	WI-A06-EB01-022318	1800367-07	Water			

A full data validation was performed on the analytical data for four water samples, two aqueous equipment blank samples, and two aqueous field blank samples collected on February 22-23, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

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
except for the following.

EDS Sample	Date Sampled	Date Extracted	# of Days	Qualifier
All Samples*	02/22/18-02/23/18	03/17/18	22-23	UJ

^{* -} Due to an oversight, the initial extraction did not contain PFDoA, therefore, all samples were re-extracted outside of holding times for this compound and qualified as estimated (UJ).

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
WI-A06-EB01-0218	None - ND	ng/L		
WI-A06-FB01-022218	None - ND	-		<u> </u>
WI-A06-EB01-022318	None - ND	æs	=	£.
WI-A06-FB01-022318	PFOS	1.48	None	All Associated ND

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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	%R	Qualifier
2	13C2-PFTeDA	14.6%	UI
3	13C2-PFTeDA	23.3%	บ้า
4	13C2-PFTeDA	11.7%	บ้า
6	13C2-PFTeDA	31.9%	UÍ
7	13C2-PFTeDA	39.8%	Uj
8	13C2-PFTeDA	17.5%	UI

Target Compound Identification

All mass spectra and quantitation criteria were met.

Compound Quantitation

All criteria were met.

Field Duplicate Sample Precision

Field duplicate results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-A06-6-S-05-0218 ng/L	WI-A06-6-S-05P-0218 ng/L	RPD	Qualifier
PFHpA	5.12U	0.654	NC	None
PFHxS	4.45	3.66	19%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information. Nancy Weaver Dated: 5/15/18

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: WI-A06-	EB01-0218								Mod	ified EPA Meth	nod 537
Client Data Name: CH2M Project: 695610	Hill 0.05.Fl.FS	Matrix: Date Colle		eous Feb-18 15:50	Lab S	oratory Data Sample: Received:	1800367-0 27-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.82	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFHxA		ND	2.21	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFHpA		ND	0.600	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFHxS		ND	0.962	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFOA		ND	0.661	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFOS		ND	0.819	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFNA		ND	0.822	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFDA		ND	1.51	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
MeFOSAA		ND	1.68	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFUnA		ND	1.07	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
EtFOSAA		ND	1.39	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFDoA		Nous	0.823	5.21	8.31		B8C0101	17-Mar-18	0.120 L	17-Mar-18 22:49	1
PFTrDA		ND	0.502	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
PFTeDA		ND	0.767	5.08	8.12		B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	100		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFHxA	IS	91.7		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C4-PFHpA	IS	90.1		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
18O2-PFHxS	IS	91.1		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFOA	IS	89.6		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C8-PFOS	IS	86.2		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C5-PFNA	IS	76.1		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFDA	IS	72.2		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
d3-MeFOSAA	IS -	85.4		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFUnA	IS	87.6		50 - 150			B8C0006	01-Mar-18	0,123 L	08-Mar-18 14:15	1
d5-EtFOSAA	IS	80.1		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
13C2-PFDoA	IS	62.0		50 - 150			B8C0101	17-Mar-18	0.120 L	17-Mar-18 22:49	Ť
13C2-PFTeDA	IS	64.9		50 - 150			B8C0006	01-Mar-18	0.123 L	08-Mar-18 14:15	1
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL- I	ower control li	mit - upper control limi	ι	When rep	ported, PFHxS,	PFOA and PFOS	include both lin	ear and branched isome	rs,

ru Slizli8

Results reported to the DL.

LOQ - Limit of quantitation

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Only the linear isomer is reported for all other analytes,



Sample ID: WI-	-A06-MW03B-0218								Mod	ified EPA Met	hod 537
	CH2M Hill 695610.05.Fl.FS	Matrix: Date Colle		Aqueous 22-Feb-18 15:00	L	aboratory Data ab Sample: Date Received:	1800367-0 27-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LO	Q Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.88	5.25	8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFHxA		3.55	2.29		8.39) J	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFHpA		ND	0.620		8.39)	B8C0006	01-Mar-18	0.119 L	13-Маг-18 04:31	1
PFHxS		ND	0.993	5.25	8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFOA		ND	0.683		8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFOS		ND	0.846	5.25	8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFNA		ND	0.849	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFDA		ND	1.56	5.25	8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
MeFOSAA		ND	1.73	5.25	8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFUnA		ND	1.10	5.25	8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
EtFOSAA		ND	1.44	5.25	8.39		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFDoA		NO WJ	0.822	2 5.21	8.30)	B8C0101	17-Mar-18	0.120 L	17-Mar-18 23:00	1
PFTrDA		ND	0.518	5.25	8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
PFTeDA		MOUJ	0.792		8.39)	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	93.1		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
13C2-PFHxA	IS	89.4		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
13C4-PFHpA	18	91.1		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
18O2-PFHxS	IS	83.6		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
13C2-PFOA	IS	82.1		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
13C8-PFOS	IS	103		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Маг-18 04:31	1
13C5-PFNA	IS	86.1		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
13C2-PFDA	JS	88.4		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
d3-MeFOSAA	IS -	68.6		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
13C2-PFUnA	IS	73.4		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
d5-EtFOSAA	IS	64.2		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
13C2-PFDoA	IS	69.8		50 - 150			B8C0101	17-Mar-18	0.120 L	17-Mar-18 23:00) 1
13C2-PFTeDA	IS	14.6		50 - 150		H	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:31	1
DL - Detection Limit	LOD - Limit of Detection	1.01.11011	awar can	trol limit - upper control limit	_	When re	norted PEHyS	PFOA and PFOS	include both lin	ear and branched isome	ers.

DL - Detection Limit

LOD - Limit of Detection LOQ - Limit of quantitation

CCL-UCL- Lower control limit - upper control limit Results reported to the DL, When reported, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

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Sample ID: WI-A06-F	B01-022218								Mod	ified EPA Met	hod 537
Client Data Name: CH2M H Project: 695610.0		Matrix: Date Colle	Aqui	eous Feb-18 15:00	Lab	oratory Data Sample: Received:	1800367-0 27-Feb-18		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.81	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFHxA		ND	2.20	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	
PFHpA		ND	0.596	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	
PFHxS		ND	0.955	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	
PFOA		ND	0.656	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFOS		ND	0.814	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFNA		ND	0.817	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFDA		ND	1.50	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
MeFOSAA		ND	1.66	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFUnA		ND	1.06	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
EtFOSAA		ND	1.38	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFDoA		NOUJ	0.847	5.34	8.56		B8C0101	17-Mar-18	0.117 L	17-Mar-18 23:12	1
PFTrDA		ND	0.498	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
PFTeDA		NO 4 J	0.761	5.04	8.07		B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	103		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFHxA	IS	96.6		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C4-PFHpA	IS	97.5		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
18O2-PFHxS	IS	90.8		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFOA	IS	83.3		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C8-PFOS	IS	85.1		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	Ţ
13C5-PFNA	IS	79.9		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFDA	IS	79.8		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
d3-MeFOSAA	IS	73.4		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFUnA	IS	67.0		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
d5-EtFOSAA	IS	69.8		50 - 150			B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
13C2-PFDoA	IS	69.0		50 - 150			B8C0101	17-Mar-18	0.117 L	17-Mar-18 23:12	1
13C2-PFTeDA	IS	23.3		50 - 150		H	B8C0006	01-Mar-18	0.124 L	08-Mar-18 14:38	1
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL-1	ower control lin	mit - upper control limi		When rep	orted, PFHxS,	PFOA and PFOS	include both line	rar and branched isome	rs,

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit Results reported to the DL.

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

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Sample ID: WI-A06-S-	02-0218								Modi	ified EPA Met	hod 5 37
Client Data Name: CH2M H Project: 695610.0		Matrix: Date Colle		queous 3-Feb-18 13:55	Lab	ooratory Data Sample: e Received:	1800367-0 27-Feb-18		Column:	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		5.03	1.88	5.25	8.41	J	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFHxA		ND	2.29	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	. 1
PFHpA		ND	0.621	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFHxS		18.0	0.995	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFOA		9.64	0.684	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFOS		ND	0.848	5.25	8.41		B8C0006		0.119 L	13-Mar-18 04:54	. 1
PFNA		ND	0.851	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFDA		ND	1.57	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	. 1
MeFOSAA		ND	1.73	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFUnA		ND	1.10	5,25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
EtFOSAA		ND	1.44	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	- 1
PFDoA		NUUJ	0.835	5.25	8.44		B8C0101	17-Mar-18	0.119 L	17-Mar-18 23:23	1
PFTrDA		ND	0.519	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
PFTeDA		KD 41	0.793	5.25	8.41		B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
Labeled Standards	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	102		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFHxA	IS	97.1		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C4-PFHpA	1S	93.1		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
18O2-PFHxS	IS	87.8		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	. 1
13C2-PFOA	IS	82.8		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	- 1
13C8-PFOS	IS	115		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C5-PFNA	IS	76.0		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFDA	IS	82.3		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04;54	1
d3-MeFOSAA	IS	98.2		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFUnA	IS	69.8		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
d5-EtFOSAA	IS	94.5		50 - 150			B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	1
13C2-PFDoA	IS	72.9		50 - 150			B8C0101	17-Mar-18	0.119 L	17-Mar-18 23:23	1
13C2-PFTeDA	IS	11.7		50 - 150		H	B8C0006	01-Mar-18	0.119 L	13-Mar-18 04:54	Ĩ
DL - Detection Limit	LOD - Limit of Detection	LCL-UCL- I	ower contro	l limit - upper control limit		When rep	orted, PFHxS,	PFOA and PFOS	include both line	ear and branched isome	rs

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Results reported to the DL.

LOQ - Limit of quantitation

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Only the linear isomer is reported for all other analytes.



Sample ID: WI-A06-6-	S-05-0218								Mod	ified EPA Metl	hod 537
Client Data Name: CH2M Hi Project: 695610.0		Matrix: Date Colle	Aque ected: 23-F	eous eb-18 10:35	Lab S	Fratory Data Sample: Received:	1800367-0 27-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.83	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFHxA		ND	2.23	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFHpA		ND	0.604	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFHxS		4.45	0.967	5.12	8.17	J	B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFOA		ND	0.665	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFOS		ND	0.824	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFNA		ND	0.827	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFDA		ND	1.52	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
MeFOSAA		ND	1.69	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFUnA		ND	1.07	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
EtFOSAA		ND	1.40	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFDoA		NOUJ	0.820	5.17	8.29		B8C0101	17-Mar-18	0.121 L	17-Mar-18 23:35	1
PFT _T DA		ND	0.505	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
PFTeDA		ND	0.771	5.12	8.17		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	89.1		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFHxA	IS	93.1		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	IV.
13C4-PFHpA	IS -	91.9		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
18O2-PFHxS	IS	83.2		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFOA	IS -	96.4		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C8-PFOS	IS	91.1		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	t)
13C5-PFNA	IS	81.0		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFDA	1S	77.6		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
d3-MeFOSAA	IS	74.1		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFUnA	IS	73.4		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
d5-EtFOSAA	IS	72.2		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	1
13C2-PFDoA	IS	59.2		50 - 150			B8C0101	17-Mar-18	0.121 L	17-Mar-18 23:35	1
13C2-PFTeDA	IS	71.5		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:01	- 1
DI D				nit - uppar control lim		- 22	orted PEHyS	Volt351			

DL - Detection Limit

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

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7	nod 537	ified EPA Meth	Modi								0218	WI-A06-6-S-05P-02	Sample ID: W
		: ВЕН С18	Column:	-	1800367-0 27-Feb-18	ratory Data ample: Received:	Lab S	eous eb-18 10:35		Matrix: Date Colle		CH2M Hill 695610.05.FI.FS	Client Data Name: Project:
n	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)			Analyte
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	1.79	ND			PFBS
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	2.17	ND			PFHxA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006	J	7.98	5.00	0.589	0.654			PFHpA
		08-Mar-18 15:13	0.125 L	01-Mar-18		J	7.98	5.00	0.945	3.66			PFHxS
	1	08-Mar-18 15:13	0.125 L	01-Mar-18			7.98	5.00	0.649	ND			PFOA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18			7.98	5.00	0.805	ND			PFOS
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	0.808	ND			PFNA
	I	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	1.49	ND			PFDA
	1	08-Маг-18 15;13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	1.65	ND			MeFOSAA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	1.05	ND			PFUnA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	1.37	ND			EtFOSAA
	1	17-Mar-18 23:46	0.118 L	17-Mar-18	B8C0101		8.48	5.30	0.840	NOUJ			PFDoA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006		7.98	5.00	0.493	ND			PFTrDA
	1	08-Mar-18 15:13		01-Mar-18	B8C0006		7.98	5.00	0.753	LN QK			PFTeDA
n.	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Type	rds	Labeled Standar
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		99.9	IS		13C3-PFBS
	1.	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		93.1	IS		13C2-PFHxA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		93.3	- IS		13C4-PFHpA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		101	IS		18O2-PFHxS
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		81.8	IS		I3C2-PFOA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		89.4	IS		3C8-PFOS
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		75.1	IS		I3C5-PFNA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		69.4	IS		13C2-PFDA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		66.2	IS		13-MeFOSAA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		59.4	IS		13C2-PFUnA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006			50 - 150		62.2	IS		15-EtFOSAA
	1	17-Mar-18 23:46	0.118 L	17-Mar-18	B8C0101			50 - 150		67.4	IS		13C2-PFDoA
	1	08-Mar-18 15:13	0.125 L	01-Mar-18	B8C0006	49		50 - 150		31.9	IS		13C2-PFTeDA

Dl. - Detection Limit

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

Only the linear isomer is reported for all other analytes.



Sample ID: WI-A06-F	B01-022318								Mod	ified EPA Met	hod 537
Client Data					Lab	oratory Data					
Name: CH2M H	tift	Matrix:	Aque	eous	Lab	Sample:	1800367-0	07	Column:	BEH C18	
Project: 695610.0	05.FI.FS	Date Colle	ected: 23-F	eb-18 15:00	Date	Received:	27-Feb-18	3 09:40		Berrero	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.83	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1
PFHxA		ND	2.23	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
PFHpA		ND	0.606	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Маг-18 15:24	
PFHxS		ND	0.971	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
PFOA		ND	0.667	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
PFOS		1.48	0.827	5.12	8.20	j	B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
PFNA		ND	0.830	5.12	8.20		B8C0006		0.122 L	08-Mar-18 15:24	
PFDA		ND	1.53	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
MeFOSAA		ND	1.69	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
PFUnA		ND	1.08	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
EtFOSAA		ND	1.40	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
PFDoA		NOUJ	0.842	5.30	8.51		B8C0101	17-Mar-18	0.118 L	17-Mar-18 23:58	121
PFTrDA		ND	0.506	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
PFTeDA		ND UJ	0.774	5.12	8.20		B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	105		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
13C2-PFHxA	IS	92.5		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1
13C4-PFHpA	IS	103		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1
18O2-PFHxS	IS	89.4		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1
13C2-PFOA	IS	75.3		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	- 1
13C8-PFOS	IS	84.9		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
13C5-PFNA	IS	70.4		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1
13C2-PFDA	IS	65.8		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	1
d3-MeFOSAA	IS	63,6		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
13C2-PFUnA	IS	55.2		50 - 150			B8C0006	01-Маг-18	0.122 L	08-Mar-18 15:24	
d5-EtFOSAA	IS	66.7		50 - 150			B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
13C2-PFDoA	IS	84.2		50 - 150			B8C0101	17-Mar-18	0,118 L	17-Mar-18 23:58	
13C2-PFTeDA	IS	39.8		50 - 150		Ж	B8C0006	01-Mar-18	0.122 L	08-Mar-18 15:24	
		1.01.101.1				When the		DECA and DECK			

DL - Detection Limit

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



Sample ID: WI-A06-E	B01-022318								Mod	ified EPA Met	hod 537
Client Data Name: CH2M H Project: 695610.0		Matrix: Date Colle	Aque ected: 23-F	eous 'eb-18 15:00	Lab S	Fratory Data Sample: Received:	1800367-0 27-Feb-18		Column	: ВЕН С18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	1.81	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFHxA		ND	2.20	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	
PFHpA		ND	0.597	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFHxS		ND	0.956	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFOA		ND	0.657	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFOS		ND	0.815	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	31
PFNA		ND	0.818	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFDA		ND	1.50	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
MeFOSAA		ND	1.67	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFUnA		ND	1.06	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	4
EIFOSAA		ND	1.38	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFDoA		Nonj	0.818	5.17	8.26		B8C0101	17-Mar-18	0.121 L	18-Mar-18 00:09	
PFTrDA		ND	0.499	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
PFTeDA		ND WJ	0.762	5.04	8.08		B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
Labeled Standards	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
3C3-PFBS	IS	97.1		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
13C2-PFHxA	IS	94.8		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
I3C4-PFHpA	IS	93.6		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
18O2-PFHxS	IS	106		50 - 150			B8C'0006	01-Mar-18	0.124 L	13-Mar-18 05:40	Ï
13C2-PFOA	1S	87.0		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
13C8-PFOS	IS	89.9		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
13C5-PFNA	IS	79.2		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
I3C2-PFDA	IS	73.0		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
I3-MeFOSAA	IS	58.1		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
I3C2-PFUnA	IS	54.4		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
d5-EtFOSAA	IS	60.4		50 - 150			B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
13C2-PFDoA	IS	67.3		50 - 150		12	B8C0101	17-Mar-18	0.121 L	18-Mar-18 00:09	1
13C2-PFTeDA	IS	17.5		50 - 150		H	B8C0006	01-Mar-18	0.124 L	13-Mar-18 05:40	1
DL - Detection Limit	LOD - Limit of Detection	LCL DCL 1	Lancas and the	nit - unner control limi		When ree	named DELICE I	DEFYA hand DEFAC	in the latest limited	ear and branched isome	

DL - Detection Limit

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

580-79031-1

Laboratory:

Test America Laboratories, Tacoma, Washington

Site:

NAS Whidbey Island, Area 6, CTO-4041, Washington

Date:

October 28, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
11	WI-A06-S-11-0718	580-79031-1	Water
2	WI-A06-6-S-40-0718	580-79031-2	Water
3	WI-A06-EB04-071818	580-79031-3	Water
4	WI-A06-6-S-41-0718	580-79031-4	Water
5	WI-A06-6-S-42-0718	580-79031-5	Water
6	WI-A06-6-S-42P-0718	580-79031-6	Water
7	WI-A06-EB05-071918	580-79031-7	Water
8	WI-A06-S-43-0718	580-79031-8	Water
8MS	WI-A06-S-43-0718MS	580-79031-8MS	Water
8MSD	WI-A06-S-43-0718MSD	580-79031-8MSD	Water
9*	WI-A06-TB01-0718	580-79031-9	Water
10*	WI-A06-TB02-0718	580-79031-10	Water
11*	WI-A06-TB03-0718	580-79031-11	Water

^{* -} VOC only

A full data validation was performed on the analytical data for six water samples, two aqueous equipment blank samples and three aqueous trip blanks sample collected on July 16-19, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

<u>Analysis</u>

Method References

VOC (Vinyl Chloride) SVOC (1,4-Dioxane)

USEPA SW-846 Method 8260C SIM USEPA SW-846 Method 8270D SIM

SVOC (1,4-Dioxane) USEPA SW-846 Method 82/0D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is 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.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

• All criteria were met.

Initial Calibration

 The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ug/L		
WI-A06-EB04-071818	None - ND	8	183	=.
WI-A06-EB05-071918	None - ND	=	- 6	-
WI-A06-TB01-0718	None - ND	*	194	:ed
WI-A06-TB02-0718	None - ND		161	≥6
WI-A06-TB03-0718	None - ND		E	(E)

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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	Affected Samples
8	Vinyl Chloride	175%/OK/26	J	8

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

Compound	WI-A06-6-S-42-0718 ug/L	WI-A06-6-S-42P-0718 ug/L	RPD	Qualifier
None	ND	ND	*	=

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB04-071818	None - ND	2	2	
WI-A06-EB05-071918	None - ND	i i	E	

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	Affected Samples
8	1,4-Dioxane	OK/OK/27	None	For RPD Alone

Laboratory Control Samples

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 results are summarized below. The precision was acceptable.

Compound	WI-A06-6-S-42-0718 ug/L	WI-A06-6-S-42P-0718 ug/L	RPD	Qualifier
1,4-Dioxane	0.20	0.15	29%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Senior Chemist

Mancy Weaver Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J=	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-S-11-0718 Lab Sample ID: 580-79031-1

Matrix: Water Lab File ID: 073018_11.D

Analysis Method: 8260C SIM Date Collected: 07/17/2018 17:35

Sample wt/vol: 5(mL) Date Analyzed: 07/30/2018 14:26

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U M	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	100		80-120

Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-6-S-40-0718

Lab Sample ID: 580-79031-2

Matrix: Water

Lab File ID: 073018 12.D

Analysis Method: 8260C SIM

Date Collected: 07/18/2018 10:17

Sample wt/vol: 5(mL)

Date Analyzed: 07/30/2018 14:49

Dilution Factor: 1

Soil Aliquot Vol: Soil Extract Vol.:

GC Column: DB-VRX ID: 0.25 (mm)

% Moisture:

Level: (low/med) Low

Units: ug/L

Analysis Batch No.: 280375

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	UM	0.50	0.019

CAS NO.	SURROGATE	%REC	Q LIMITS
98-08-8	Trifluorotoluene (Surr)	103	80-120
1868-53-7	Dibromofluoromethane (Surr)	101	80-120

Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-EB04-071818 Lab Sample ID: 580-79031-3

Matrix: Water

Lab File ID: 073018_13.D Analysis Method: 8260C SIM Date Collected: 07/18/2018 15:50

Sample wt/vol: 5(mL)

Date Analyzed: 07/30/2018 15:12 Dilution Factor: 1

Soil Aliquot Vol:

Soil Extract Vol.:

% Moisture:

GC Column: DB-VRX ID: 0.25 (mm) Level: (low/med) Low

Analysis Batch No.: 280375 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	101		80-120

Lab Name: TestAmerica Seattle

SDG No.:

Client Sample ID: WI-A06-6-S-41-0718

Matrix: Water

Analysis Method: 8260C SIM

Sample wt/vol: 5(mL)

Soil Aliquot Vol:

Soil Extract Vol.:

% Moisture:

Analysis Batch No.: 280375

Job No.: 580-79031-1

Lab Sample ID: 580-79031-4 Lab File ID: 073018_14.D

Date Collected: 07/18/2018 13:50

Date Analyzed: 07/30/2018 15:35

Dilution Factor: 1

GC Column: DB-VRX ID: 0.25(mm)

Level: (low/med) Low

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	עט	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-6-S-42-0718

Lab Sample ID: 580-79031-5

Matrix: Water

Lab File ID: 073018_15.D

Analysis Method: 8260C SIM

Date Collected: 07/19/2018 09:45

Sample wt/vol: 5(mL)

Analysis Batch No.: 280375

Date Analyzed: 07/30/2018 15:58

Soil Aliquot Vol:

Dilution Factor: 1

Soil Extract Vol.:

GC Column: DB-VRX

ID: 0.25(mm)

% Moisture:

Level: (low/med) Low

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	101		80-120



Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-6-S-42P-0718

Lab Sample ID: 580-79031-6

Matrix: Water

Lab File ID: 073018 16.D

Date Collected: 07/19/2018 09:55

Sample wt/vol: 5(mL)

Date Analyzed: 07/30/2018 16:22

Soil Aliquot Vol:

Dilution Factor: 1

GC Column: DB-VRX ID: 0.25 (mm)

% Moisture:

Level: (low/med) Low_

Analysis Batch No.: 280375

Soil Extract Vol.:

Analysis Method: 8260C SIM

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	102		80-120



Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-EB05-071918

Matrix: Water

Analysis Method: 8260C SIM

Sample wt/vol: 5(mL)

Soil Aliquot Vol:

Soil Extract Vol.:

% Moisture:

Analysis Batch No.: 280375

Lab Sample ID: 580-79031-7

Lab File ID: 073018 17.D

Date Collected: 07/19/2018 16:15

Date Analyzed: 07/30/2018 16:45

Dilution Factor: 1

GC Column: DB-VRX ID: 0.25 (mm)

Level: (low/med) Low

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	102		80-120
1868-53-7	Dibromofluoromethane (Surr)	102		80-120

Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-S-43-0718

Lab Sample ID: 580-79031-8

Matrix: Water

Lab File ID: 073018 18.D

Date Collected: 07/19/2018 14:05

Sample wt/vol: 5(mL)

Date Analyzed: 07/30/2018 17:08

DESIM O

Soil Aliquot Vol:

Dilution Factor: 1

Soil Extract Vol.:

GC Column: DB-VRX

ID: 0.25 (mm)

% Moisture:

CAS NO

Level: (low/med) Low

T 00

Analysis Batch No.: 280375

Analysis Method: 8260C SIM

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	1.8	13	0.50	0.019
CAC NO	QVIDDOG3.MI		0.555		I TMTMO

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	103		80-120

Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: W1-A06-TB01-0718

Lab Sample ID: 580-79031-9

Matrix: Water

Lab File ID: 073018_08.D

Analysis Method: 8260C SIM

Date Collected: 07/16/2018 12:00

Sample wt/vol: 5(mL)

Date Analyzed: 07/30/2018 13:16

Dilution Factor: 1

Soil Aliquot Vol:

GC Column: DB-VRX ID: 0.25 (mm)

Soil Extract Vol.:

Level: (low/med) Low

% Moisture:

Analysis Batch No.: 280375

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	102		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: W1-A06-TB02-0718

Lab Sample ID: 580-79031-10

Matrix: Water

Lab File ID: 073018_09.D

Analysis Method: 8260C SIM

Date Collected: 07/16/2018 12:00

Sample wt/vol: 5(mL)

Date Analyzed: 07/30/2018 13:40

Soil Aliquot Vol:

Dilution Factor: 1

Soil Extract Vol.:

GC Column: DB-VRX

ID: 0.25(mm)

% Moisture:

Level: (low/med) Low

Analysis Batch No.: 280375

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	Ū	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS	
98-08-8	Trifluorotoluene (Surr)	102		80-120	
1868-53-7	Dibromofluoromethane (Surr)	100		80-120	

0.019

Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-TB03-0718

Vinyl chloride

Lab Sample ID: 580-79031-11

Matrix: Water

Lab File ID: 073018 10.D

Analysis Method: 8260C SIM

Date Collected: 07/16/2018 12:00 Date Analyzed: 07/30/2018 14:03

Sample wt/vol: 5(mL)

Dilution Factor: 1

Soil Aliquot Vol:

GC Column: DB-VRX

ID: 0.25 (mm)

Soil Extract Vol.:

75-01-4

Level: (low/med) Low

0.040 U 🔏

0.50

% Moisture: Analysis Batch No.: 280375

			_		
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

Lab File ID: 072718a007.D

Dilution Factor: 1

GPC Cleanup: (Y/N) N

Date Extracted: 07/24/2018 14:40

Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-S-11-0718 Lab Sample ID: 580-79031-1

Matrix: Water

Analysis Method: 8270D SIM Date Collected: 07/17/2018 17:35

Extract. Method: 3520C

Sample wt/vol: 1029.2(mL) Date Analyzed: 07/27/2018 18:14

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture:

Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	4.4	Þ	0.19	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	84		53-106



Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-6-S-40-0718 Lab Sample ID: 580-79031-2

Matrix: Water

Date Collected: 07/18/2018 10:17 Analysis Method: 8270D SIM

Extract. Method: 3520C

Sample wt/vol: 1054.3(mL)

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL)

% Moisture:

Analysis Batch No.: 280257

Lab File ID: 072718a008.D

Date Extracted: 07/24/2018 14:40

Date Analyzed: 07/27/2018 18:40

Dilution Factor: 1

Level: (low/med) Low

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.047	U M Q	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	76		53-106

Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Matrix: Water Lab File ID: 072718a009.D

Analysis Method: 8270D SIM Date Collected: 07/18/2018 15:50

Extract. Method: 3520C Date Extracted: 07/24/2018 14:40

Sample wt/vol: 1015.5(mL) Date Analyzed: 07/27/2018 19:06

Con. Extract Vol.: 2(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 280257 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.049	U 13 Q	0.20	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	80		53-106

Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No .:

Client Sample ID: WI-A06-6-S-41-0718

Lab Sample ID: 580-79031-4

Matrix: Water

Lab File ID: 072718a010.D

Analysis Method: 8270D SIM

Date Collected: 07/18/2018 13:50

Extract. Method: 3520C

Date Extracted: 07/24/2018 14:40

Sample wt/vol: 1057(mL)

Date Analyzed: 07/27/2018 19:32

Con. Extract Vol.: 2(mL)

Dilution Factor: 1

Injection Volume: 1(uL)

Level: (low/med) Low

% Moisture:

GPC Cleanup: (Y/N) N

Analysis Batch No.: 280257

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.047	U 🌓	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	70		53-106



Lab Name: TestAmerica Seattle

Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-6-S-42-0718

Lab Sample ID: 580-79031-5

Matrix: Water

Lab File ID: 072718a011.D

Analysis Method: 8270D SIM

Date Collected: 07/19/2018 09:45

Extract. Method: 3520C

Date Extracted: 07/24/2018 14:40

Sample wt/vol: 1056(mL)

Date Analyzed: 07/27/2018 19:58 Dilution Factor: 1

Con. Extract Vol.: 2(mL)

Level: (low/med) Low

Injection Volume: 1(uL)

% Moisture:

GPC Cleanup: (Y/N) N

Analysis Batch No.: 280257

LOQ	DL
0.19	0.034
	0.19

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	87		53-106



Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-6-S-42P-0718 Lab Sample ID: 580-79031-6

Matrix: Water

Analysis Method: 8270D SIM

Extract. Method: 3520C

Sample wt/vol: 1019.5(mL)

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL)

% Moisture:

Analysis Batch No.: 280257

Lab File ID: 072718a012.D

Date Collected: 07/19/2018 09:55

Date Extracted: 07/24/2018 14:40

Date Analyzed: 07/27/2018 20:24

Dilution Factor: 1

Level: (low/med) Low

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.15	J	0.20	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	73		53-106

Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-EB05-071918 Lab Sample ID: 580-79031-7

Matrix: Water

Analysis Method: 8270D SIM

Extract. Method: 3520C

Sample wt/vol: 1047.9(mL)

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL)

% Moisture:

Analysis Batch No.: 280257

Lab File ID: 072718a013.D

Date Collected: 07/19/2018 16:15

Date Extracted: 07/24/2018 14:40

Date Analyzed: 07/27/2018 20:50

Dilution Factor: 1

Level: (low/med) Low

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.048	υ¢	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	72		53-106

Lab Name: TestAmerica Seattle Job No.: 580-79031-1

SDG No.:

Client Sample ID: WI-A06-S-43-0718 Lab Sample ID: 580-79031-8

Matrix: Water

Analysis Method: 8270D SIM

Extract. Method: 3520C

Sample wt/vol: 1054.4(mL)

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL)

% Moisture:

Analysis Batch No.: 280257

Lab File ID: 072718a014.D

Date Collected: 07/19/2018 14:05

Date Extracted: 07/24/2018 14:40

Date Analyzed: 07/27/2018 21:16

Dilution Factor: 1

Level: (low/med) Low

GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	2.8	J 6	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	73		53-106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1801866

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 26, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-FB01-071718	1801866-01	Water
2	WI-A06-S-11-0718	1801866-02	Water
3	WI-A06-6-S-40-0718	1801866-03	Water
4	WI-A06-FB02-071818	1801866-04	Water
5	WI-A06-EB01-071718	1801866-05	Water
6	WI-A06-EB02-071718	1801866-06	Water
7	WI-A06-EB03-071718	1801866-07	Water
8	WI-A06-EB04-071818	1801866-08	Water
9	WI-A06-6-S-41-0718	1801866-09	Water
10	WI-A06-6-S-42-0718	1801866-10	Water
11	WI-A06-6-S-42P-0718	1801866-11	Water
12	WI-A06-FB03-071918	1801866-12	Water
13	WI-A06-EB05-071918	1801866-13	Water
14	WI-A06-6-S-43-0718	1801866-14	Water
14MS	WI-A06-6-S-43-0718MS	1801866-14MS	Water
14MSD	WI-A06-6-S-43-0718MSD	1801866-14MSD	Water

A full data validation was performed on the analytical data for six water samples, five aqueous equipment blank samples, and three aqueous field blank samples collected on July 17-19, 2018 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:

<u>Analysis</u> PFCs <u>Method References</u>

USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB01-071718	None - ND		16	3
WI-A06-FB02-071818	None - ND	+		:=V
WI-A06-EB01-071718	None - ND	-	-	
WI-A06-EB02-071718	None - ND	-	==	-
WI-A06-EB03-071718	None - ND	2	-	1.00
WI-A06-EB04-071818	None - ND	=	-	
WI-A06-FB03-071918	None - ND		-	
WI-A06-EB05-071918	None - ND	=	2	=

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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 results are summarized below. The precision was acceptable.

		PFCs		_
Compound	WI-A06-6-S-42-0718 ng/L	WI-A06-6-S-42P-0718 ng/L	RPD	Qualifier
None	ND	ND		

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information. Mancy Weaver Dated: 10/29/18

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: W	VI-A06-FB01-071718								PFAS Isotope Dilution Method			
Client Data Name: Project:	CH2M Hill NASWI Area 6/ CTO-4041	Matrix: Date Col	Matrix: Aqueous Date Collected: 17-Jul-18			oratory Data Sample: Received:	1801866-01 21-Jul-18 09:16		Column:	BEH C18		
Analyte	CAS Numb	er Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFHxA	307-24-4	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFHpA	375-85-9	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFHxS	355-46-4	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFOA	335-67-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFNA	375-95-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFOS	1763-23-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFDA	335-76-2	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
MeFOSAA	2355-31-9		2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
EtFOSAA	2991-50-6		2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFUnA	2058-94-8	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFDoA	307-55-1	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFTrDA	72629-94-8	ND ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
PFTeDA	376-06-7	ND	2.86	4.17	8.36		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
Labeled Standar		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution	
13C3-PFBS	IS	111		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C2-PFHxA	IS	88.3		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C4-PFHpA	IS	93.3		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
18O2-PFHxS	IS	91.5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C2-PFOA	IS	88.1		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C5-PFNA	IS	82.0		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C8-PFOS	IS	87.1		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C2-PFDA	IS	64.8		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
d3-MeFOSAA	IS .	73.5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
d5-EtFOSAA	IS	55.7		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C2-PFUnA	IS	59.9		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C2-PFDoA	IS	62.2		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
13C2-PFTeDA	IS -	82.3		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:17	1	
DL - Detection Limi			orted to the DL.	30 100		When re				OSAA include both		

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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Sample ID: V	VI-A06-S-11-0718									PFAS Isotope Dilution Method			
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO-40 6-S-11	041	Matrix: Date Coll	Aquedected: 17-Ju	ous I-18 17:35	Lab	oratory Data Sample: Received:	1801866-0 21-Jul-18		Column:	BEH C18		
Analyte		CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS		375-73-5	9.31	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFHxA		307-24-4	29.9	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1.	
PFHpA		375-85-9	5.13	2.84	4.17	8.30	J	B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFHxS		355-46-4	20.1	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFOA		335-67-1	43.4	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFNA		375-95-1	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFOS		1763-23-1	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFDA		335-76-2	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
MeFOSAA		2355-31-9	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
EtFOSAA		2991-50-6	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFUnA		2058-94-8	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFDoA		307-55-1	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFTrDA		72629-94-8	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
PFTeDA		376-06-7	ND	2.84	4.17	8.30		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	- 4	
Labeled Standa	rds	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS		IS	112		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C2-PFHxA		IS	95.2		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C4-PFHpA		IS	86.6		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
18O2-PFHxS		IS	111		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C2-PFOA		IS	85.5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C5-PFNA		IS	93.5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C8-PFOS		IS	93.8		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C2-PFDA		IS	88.0		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
d3-MeFOSAA		IS	73,5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
d5-EtFOSAA		IS	85.9		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C2-PFUnA		IS	79.5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C2-PFDoA		IS	94.5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	
13C2-PFTeDA		IS	95.7		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:27	1	

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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Sample ID: WI-	-A06-6-S-40-0718									PFAS Iso	tope Dilution	Method
Project:	CH2M Hill NASWI Area 6/ CTO-4041 6-S-40		Matrix: Date Coll		eous lul-18 10:17	Lab 9	oratory Data Sample: Received:	1801866-0 21-Jul-18		Column:	BEH C18	
Analyte	CAS Nu	mber C	onc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73	3-5	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFHxA	307-24	I-4	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFHpA	375-83	5-9	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFHxS	355-46	5-4	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFOA	335-6	7-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFNA	375-95	5-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFOS	1763-2	3-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFDA	335-76	5-2	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1.
MeFOSAA	2355-3	1-9	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
EtFOSAA	2991-5	0-6	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFUnA	2058-9	4-8	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFDoA	307-55	i-1	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFTrDA	72629-9	4-8	ND _	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
PFTeDA	376-06	- 7	ND	2.84	4.17	8.31		B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
Labeled Standards			% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS		109		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFHxA	IS		90.4		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C4-PFHpA	IS		85.9		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
18O2-PFHxS	IS		101		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFOA	IS		89.3		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C5-PFNA	IS		85.8		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C8-PFOS	IS		102		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFDA	IS		68.1		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
d3-MeFOSAA	IS		79.1		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	Î
d5-EtFOSAA	IS		77.6		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFUnA	IS		73.0		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFDoA	IS		84.5		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
13C2-PFTeDA	IS		96.0		50 - 150			B8G0166	23-Jul-18	0.120 L	26-Jul-18 23:58	1
DL - Detection Limit	LOD - Limit of De	ection		orted to the DL			When rer				OSAA include both	

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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Sample ID: W	/I-A06-FB02-071818								PFAS Iso	tope Dilution	Method
Client Data Name: Project:	CH2M Hill NASWI Area 6/ CTO-4041	Matrix: Date Col	Matrix: Aqueous Date Collected: 18-Jul-18 10:17			Laboratory Data Lab Sample: Date Received:			Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFHxA	307-24-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	-1
PFHpA	375-85-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	
PFHxS	355-46-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	
PFOA	335-67-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFNA	375-95-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFOS	1763-23-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	
PFDA	335-76-2	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	
MeFOSAA	2355-31-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
EtFOSAA	2991-50-6	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	
PFUnA	2058-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFDoA	307-55-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFTrDA	72629-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
PFTeDA	376-06-7	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
Labeled Standar		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	101		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFHxA	IS	96.0		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C4-PFHpA	IS	90.0		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
18O2-PFHxS	IS	106		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFOA	IS	87.8		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C5-PFNA	IS	78.9		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C8-PFOS	IS	103		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFDA	IS	66.1		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
d3-MeFOSAA	IS	75.7		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
d5-EtFOSAA	IS	77.1		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	Ĭ
13C2-PFUnA	IS	65.5		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFDoA	IS	74.0		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	1
13C2-PFTeDA	IS	92.2		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:09	Ī

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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Sample ID: W	/I-A06-EB01-071718								PFAS Iso	tope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO-4041 Tubing	Matrix: Date Col	Aqu lected: 17-J	eous ul-18 17:15	Lab :	Sample: Received:	1801866-0 21-Jul-18		Column:	BEH C18	
Analyte	CAS Numbe	r Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFHxA	307-24-4	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFHpA	375-85-9	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFHxS	355-46-4	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	
PFOA	335-67-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFNA	375-95-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFOS	1763-23-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFDA	335-76-2	ND	2.87	4,20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
MeFOSAA	2355-31-9	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
EtFOSAA	2991-50-6	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFUnA	2058-94-8	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFDoA	307-55-1	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	
PFTrDA	72629-94-8	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
PFTeDA	376-06-7	ND	2.87	4.20	8.37		B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
Labeled Standar		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	95.6		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFHxA	IS	89.2		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C4-PFHpA	lS .	83.4		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	
18O2-PFHxS	IS	96.3		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFOA	IS	85.7		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C5-PFNA	IS	77.3		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C8-PFOS	IS	97.1		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFDA	IS	74.4		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
d3-MeFOSAA	IS	60.1		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
d5-EtFOSAA	IS	74.9		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	4
13C2-PFUnA	IS	73.4		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFDoA	IS	73.8		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1
13C2-PFTeDA	IS	78.8		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 00:20	1

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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Sample ID: W	/I-A06-EB02-071718								PFAS Isotope Dilution Method			
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO-4041 Bladder	Matrix: Date Coll	Aque ected: 17-Ju	ous ıl-18 17:25	Lab S	oratory Data Sample: Received:	1801866-0 21-Jul-18		Column:	BEH C18		
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
PFHxA	307-24-4	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
PFHpA	375-85-9	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
PFHxS	355-46-4	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
PFOA	335-67-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
PFNA	375-95-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
PFOS	1763-23-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
PFDA	335-76-2	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
MeFOSAA	2355-31-9	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
EtFOSAA	2991-50-6	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
PFUnA	2058-94-8	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
PFDoA	307-55-1	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
PFTrDA	72629-94-8	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1.	
PFTeDA	376-06-7	ND	2.84	4.13	8.29		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	112		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
13C2-PFHxA	IS	95.4		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
13C4-PFHpA	IS	93.4		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
18O2-PFHxS	IS	98.8		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
13C2-PFOA	IS	89.4		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
13C5-PFNA	IS	68.3		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
13C8-PFOS	IS	84.5		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
13C2-PFDA	IS	73.0		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	ī	
d3-MeFOSAA	IS	88.8		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
d5-EtFOSAA	IS	86.7		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30		
13C2-PFUnA	IS	73.3		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
13C2-PFDoA	IS	75.9		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	
13C2-PFTeDA	IS	99.2		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:30	1	

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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Sample ID: V	VI-A06-EB03-071718									PFAS Iso	tope Dilution 1	Method
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO-40 Pump	41	Matrix: Date Colle	Aque ected: 17-Ju	ous ıl-18 18:30	Lab S	oratory Data Sample: Received:	1801866-0 21-Jul-18		Column:	BEH C18	
Analyte		CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFHxA		307-24-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	4-
PFHpA		375-85-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFHxS		355-46-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFOA		335-67-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFNA		375-95-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
PFOS		1763-23-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFDA		335-76-2	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
MeFOSAA		2355-31-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
EtFOSAA		2991-50-6	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
PFUnA		2058-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFDoA		307-55-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
PFTrDA		72629-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
PFTeDA		376-06-7	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
Labeled Standa	rds	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS		IS	103		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFHxA		IS	88.4		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
13C4-PFHpA		IS	86.0		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
18O2-PFHxS		IS	109		50 = 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFOA		IS	93.8		50 = 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C5-PFNA		IS	89.0		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C8-PFOS		IS	99.8		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFDA		IS	74.0		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
d3-MeFOSAA		IS	73.9		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
d5-EtFOSAA		IS	85.4		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	1
13C2-PFUnA		IS	75.7		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
13C2-PFDoA		IS	68.2		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
13C2-PFTeDA		IS	90.5		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 00:40	
DL - Detection Lin		imit of Detection		rted to the DL.			11/1	and a pint of	DECAM DECAM	LIPANE A A J. Pal	OSAA include both	

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

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

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Sample ID: W	VI-A06-EB04-071818								PFAS Iso	tope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO-4041 Pump	Matrix: Date Col	Aque lected: 18-Ju	ous :l-18 15:50	Lab S	Sample: Received:	1801866-(21-Jul-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFHxA	307-24-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFHpA	375-85-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFHxS	355-46-4	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFOA	335-67-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFNA	375-95-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	
PFOS	1763-23-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFDA	335-76-2	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	
MeFOSAA	2355-31-9	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
EtFOSAA	2991-50-6	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFUnA	2058-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	
PFDoA	307-55-1	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	
PFTrDA	72629-94-8	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
PFTeDA	376-06-7	ND	2.82	4.13	8.24		B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	128		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFHxA	IS	90.5		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C4-PFHpA	IS	94.9		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
18O2-PFHxS	IS	93.2		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFOA	IS	91.0		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C5-PFNA	IS	82.0		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C8-PFOS	IS	113		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFDA	IS	78.1		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	
d3-MeFOSAA	IS	70.7		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
d5-EtFOSAA	IS	72.8		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFUnA	IS	65.5		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	
13C2-PFDoA	IS	68.1		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1
13C2-PFTeDA	IS	77.0		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 00:51	1

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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/I-A06-6-S-41-0718								PFAS Iso	tope Dilution	Method
CH2M Hill NASWI Area 6/ CTO-4041 6-S-41	Matrix: Date Coll	•		Lab S	Sample:			Column:	BEH C18	
CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
375-73-5	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
307-24-4	ND	2.83	4.13	8.25		B8G0166	23-Jul-18		27-Jul-18 01:01	1
375-85-9	ND	2.83	4.13	8.25		B8G0166	23-Jul-18		27-Jul-18 01:01	1
355-46-4	ND		4.13				23-Jul-18			1
335-67-1	ND		4.13			B8G0166	23-Jul-18		27-Jul-18 01:01	1
375-95-1	ND		4.13			B8G0166	23-Jul-18		27-Jul-18 01:01	1
1763-23-1	ND					B8G0166	23-Jul-18			1
335-76-2	ND					B8G0166	23-Jul-18	0.121 L		i i
2355-31-9	ND	2.83	4.13	8.25		B8G0166	23-Jul-18	0.121 L		1
2991-50-6	ND		4.13			B8G0166	23-Jul-18	0.121 L		1
2058-94-8	ND					B8G0166	23-Jul-18	0.121 L		1
307-55-1	ND					B8G0166	23-Jul-18	0.121 L		14
72629-94-8	ND					B8G0166	23-Jul-18			1
376-06-7	ND	2.83		8.25		B8G0166	23-Jul-18			i
rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
IS	125		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
	93.0		50 - 150					0.121 L	27-Jul-18 01:01	1
	99.0					B8G0166	23-Jul-18	0.121 L		1
IS	97.3		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	î
	90.2		50 - 150				23-Jul-18	0.121 L		1
	91.4		50 - 150			B8G0166	23-Jul-18	0.121 L		1
	94.2		50 - 150				23-Jul-18			1
	78.1		50 - 150			B8G0166	23-Jul-18			1
	76.2		50 - 150			B8G0166	23-Jul-18			Ī
	67.8		50 - 150				23-Jul-18			1
	81.0		50 - 150			B8G0166	23-Jul-18	0.121 L		1
	89.1		50 - 150			B8G0166	23-Jul-18			1
IS	99.2		50 - 150			B8G0166	23-Jul-18	0.121 L	27-Jul-18 01:01	1
	CH2M Hill NASWI Area 6/ CTO-4041 6-S-41 CAS Number 375-73-5 307-24-4 375-85-9 355-46-4 335-67-1 375-95-1 1763-23-1 335-76-2 2355-31-9 2991-50-6 2058-94-8 307-55-1 72629-94-8 376-06-7 ds Type IS IS IS IS IS IS IS IS IS IS IS IS IS	CH2M Hill NASWI Area 6/ CTO-4041 6-S-41 CAS Number Conc. (ng/L) 375-73-5 ND 307-24-4 ND 375-85-9 ND 355-46-4 ND 335-67-1 ND 375-95-1 ND 1763-23-1 ND 2355-31-9 ND 2295-50-6 ND 2255-31-9 ND 2991-50-6 ND 2091-50-6 ND 376-06-7 ND Type ND Type Recovery IS IS 125 IS 93.0 IS 99.0 IS 99.0 IS 99.0 IS 99.1 IS 99.2 IS 91.4 IS 94.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.2 IS 1S 76.8 IS 1S 89.1	CH2M Hill NASWI Area 6/ CTO-4041 6-S-41 CAS Number Conc. (ng/L) DL	CH2M Hill NASWI Area 6/ CTO-4041 6-S-41 CAS Number	CH2M Hill NASWI Area 6/ CTO-4041 6-S-41 CAS Number COnc. (ng/L) 375-73-5 ND 2.83 4.13 8.25 307-24-4 ND 2.83 4.13 8.25 375-85-9 ND 2.83 4.13 8.25 375-85-9 ND 2.83 4.13 8.25 375-85-9 ND 2.83 4.13 8.25 335-46-4 ND 2.83 4.13 8.25 335-46-1 ND 2.83 4.13 8.25 335-76-1 ND 2.83 4.13 8.25 335-76-2 ND 2.83 4.13 8.25 335-76-2 ND 2.83 4.13 8.25 2355-31-9 ND 2.83 4.13 8.25 2355-31-9 ND 2.83 4.13 8.25 2355-31-9 ND 2.83 4.13 8.25 2991-50-6 ND 2.83 4.13 8.25 2998-94-8 ND 2.83 4.13 8.25 307-55-1 ND 2.83 4.13 8.25 307-55-1 ND 2.83 4.13 8.25 307-55-1 ND 2.83 4.13 8.25 307-55-1 ND 2.83 4.13 8.25 307-60-7 ND 2.83 4.13 8.25 4.	Matrix: Aqueous Date Collected: 18-Jul-18 13:50 Date Received:	CH2M Hill Matrix: Aqueous Lab Sample: 1801866-4 NASWI Area 6/ CTO-4041 Date Collected: 18-Jul-18 13:50 Date Received: 21-Jul-18 CAS Number Conc. (ng/L) DL LOD LOQ Qualifiers Batch	CH2M Hill Matrix: Aqueous Lab Sample: 1801866-09 Date Received: 21-Jul-18 09:16	CH2M Hill NASWI Area 6/ CTO-4041 6-S-41 CAS Number CONC. (ng/L) DL LOD LOQ Qualifiers Batch Sample: 21-Jul-18 09:16 Samp Size Sa	CH2M Hill NASWI Area of CTO-4041 6-S-41 CAS Number Conc. (ng/L) Date Collected: 18-Jul-18 13:50 CAS Number Conc. (ng/L) DL DOD DOQ Qualifiers Batch Saryole: 21-Jul-18 09:16 CAS Number Conc. (ng/L) DL DOQ Qualifiers Batch Saryole: 23-Jul-18 D.121 L D.7-Jul-18 01:01 375-73-5 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-84-9 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-84-4 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-94-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-95-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-95-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-95-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-95-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-95-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 375-95-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 275-Jul-18 01:01 275-Jul-18 01:01 275-Jul-18 01:01 375-95-1 ND D.83 Al.13 S.25 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 275-Jul-18 01:01 375-D.15 BSG0166 D.3-Jul-18 D.121 L D.7-Jul-18 01:01 275-Jul-18 01:01

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

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



Sample ID: W	/I-A06-6-S-42-0718								PFAS Iso	tope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO-4041 6-S-42	Matrix: Date Col	Aque lected: 19-Ju	ous 1-18 09:45	Lab S	oratory Data Sample: Received:	1801866-; 21-Jul-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilutio
PFBS	375-73-5	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFHxA	307-24-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFHpA	375-85-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFHxS	355-46-4	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFOA	335-67-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFNA	375-95-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFOS	1763-23-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFDA	335-76-2	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
MeFOSAA	2355-31-9	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
EtFOSAA	2991-50-6	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFUnA	2058-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFDoA	307-55-1	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFTrDA	72629-94-8	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
PFTeDA	376-06-7	ND	2.81	4.10	8.21		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	126		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFHxA	IS	102		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C4-PFHpA	IS	101		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
18O2-PFHxS	IS	103		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFOA	IS	83.0		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C5-PFNA	IS	78.0		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C8-PFOS	IS	121		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFDA	IS	74.2		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	Ī
d3-MeFOSAA	IS	79.6		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
d5-EtFOSAA	IS	94.5		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	i
13C2-PFUnA	IS	77.0		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFDoA	IS	91.7		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
13C2-PFTeDA	IS	109		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:12	1
DL - Detection Limit			orted to the DL.			When re				OSAA include both	

LOQ - Limit of quantitation

linear and branched isomers. Only the linear isomer is reported for all other analytes.

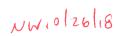
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Sample ID: W	'I-A06-6-S-42P-071	8								PFAS Iso	tope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO 6-S-42 Duplicate	-4041	Matrix: Date Coll	Aque ected: 19-Ju	ous I-18 09:55	Lab S	Dratory Data Sample: Received:	1801866-1 21-Jul-18		Column:	BEH C18	
Analyte		CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFHxA		307-24-4	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFHpA		375-85-9	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFHxS		355-46-4	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFOA		335-67-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFNA		375-95-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFOS		1763-23-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFDA		335-76-2	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
MeFOSAA		2355-31-9	ND	2.87	4.20	8,38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
EtFOSAA		2991-50-6	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFUnA		2058-94-8	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFDoA		307-55-1	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFTrDA		72629-94-8	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
PFTeDA		376-06-7	ND	2.87	4.20	8.38		B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
Labeled Standar	ds	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS		IS	112		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFHxA		IS	91.6		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C4-PFHpA		IS	92.7		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
18O2-PFHxS		IS	100		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFOA		IS	83.4		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C5-PFNA		IS	86.5		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C8-PFOS		IS	91.5		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFDA		IS	79.2		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
d3-MeFOSAA		IS	92.6		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
d5-EtFOSAA		IS	90.0		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFUnA		IS	78.5		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1
13C2-PFDoA		IS	70.6		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	Ĩ
13C2-PFTeDA		IS	94.4		50 - 150			B8G0166	23-Jul-18	0.119 L	27-Jul-18 01:22	1

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.

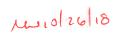


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Sample ID: WI-A06-F	B03-071918								PFAS Iso	tope Dilution	Method
Client Data Name: CH2M F Project: NASWI	Hill Area 6/ CTO-4041	Matrix: Date Col	Aqueo lected: 19-Jul	ous -18 09:55	Lab S	oratory Data Sample: Received:	1801866-1 21-Jul-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFHxA	307-24-4	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFHpA	375-85-9	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFHxS	355-46-4	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFOA	335-67-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFNA	375-95-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFOS	1763-23-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFDA	335-76-2	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
MeFOSAA	2355-31-9	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
EtFOSAA	2991-50-6	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFUnA	2058-94-8	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFDoA	307-55-1	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFT _T DA	72629-94-8	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
PFTeDA	376-06-7	ND	2.85	4.17	8.31		B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	- 1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	127		50 ~ 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C2-PFHxA	IS	100		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
I3C4-PFHpA	IS	101		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
18O2-PFHxS	IS	95.1		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C2-PFOA	IS	95.8		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C5-PFNA	IS	79.1		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C8-PFOS	IS	91.0		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C2-PFDA	IS	65.1		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
d3-MeFOSAA	IS	78.2		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
d5-EtFOSAA	IS	61.6		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C2-PFUnA	IS	59.7		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C2-PFDoA	IS	73.7		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
13C2-PFTeDA	IS	87.3		50 - 150			B8G0166	23-Jul-18	0.120 L	27-Jul-18 01:33	1
DL - Detection Limit	LOD - Limit of Detection	Results ren	orted to the DL			When rer	orted PFHxS	PEOA PEOS M	eFOSAA and Et	OSAA include both	

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



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Sample ID: V	WI-A06-EB05-071918								PFAS Iso	tope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6/ CTO-4041 Pump	Matrix: Date Coll	Aque ected: 19-Ji	eous ul-18 16:15	Lab S	Sample: Received:	1801866-1 21-Jul-18		Column:	ВЕН С18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFHxA	307-24-4	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFHpA	375-85-9	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	î
PFHxS	355-46-4	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
PFOA	335-67-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFNA	375-95-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFOS	1763-23-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFDA	335-76-2	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
MeFOSAA	2355-31-9	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
EtFOSAA	2991-50-6	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFUnA	2058-94-8	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFDoA	307-55-1	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFTrDA	72629-94-8	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
PFTeDA	376-06-7	ND	2.82	4.10	8.23		B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
Labeled Standa		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	102		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFHxA	IS	89.1		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C4-PFHpA	IS .	87.6		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
18O2-PFHxS	IS	81.0		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
13C2-PFOA	IS	84.4		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C5-PFNA	IS	88.1		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
13C8-PFOS	IS	99.5		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	1
13C2-PFDA	IS	70.3		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
d3-MeFOSAA	IS	59.5		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
d5-EtFOSAA	IS	90.2		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
13C2-PFUnA	IS	73.3		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
13C2-PFDoA	IS	66.3		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
13C2-PFTeDA	IS	102		50 - 150			B8G0166	23-Jul-18	0.122 L	27-Jul-18 01:43	
DL - Detection Lin	nit LOD - Limit of Detection	Daniela san	orted to the DL.			11/4	1 100011 0	DECA DECAG M		OSAA include both	

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.

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

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Sample ID: WI-	-A06-6-S-43-0718								PFAS Iso	tope Dilution	Method
Project:	CH2M Hill NASWI Area 6/ CTO-4041 6-S-43	Matrix: Date Co	1.	eous ul-18 14:05	Lab S	Sample: Received:	1801866-1 21-Jul-18		Column:	BEH C18	
Analyte	CAS Numl	per Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFHxA	307-24-4	9.46	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFHpA	375-85-9	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFHxS	355-46-4	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFOA	335-67-1	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFNA	375-95-1	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFOS	1763-23-	l ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFDA	335-76-2	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
MeFOSAA	2355-31-	9 ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
EtFOSAA	2991-50-	6 ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFUnA	2058-94-	8 ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFDoA	307-55-1	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFTrDA	72629-94-	8 ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
PFTeDA	376-06-7	ND	2.89	4.24	8.45		B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	- 1
Labeled Standards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	119		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFHxA	IS	89.2		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C4-PFHpA	IS	98.3		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
18O2-PFHxS	IS	88.1		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFOA	IS	90.1		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C5-PFNA	1S	80.1		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C8-PFOS	IS	98.0		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFDA	IS	68.9		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
d3-MeFOSAA	IS	96.9		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
d5-EtFOSAA	IS	98.5		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFUnA	IS	84.8		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFDoA	IS	83.3		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
13C2-PFTeDA	IS	101		50 - 150			B8G0166	23-Jul-18	0.118 L	27-Jul-18 01:54	1
DL - Detection Limit	LOD - Limit of Detect		eported to the DL.			When rer				OSAA include both	

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



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DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-80030-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 28, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-S-24-0818	580-80030-1	Water
1MS	WI-A06-S-24-0818MS	580-80030-1MS	Water
1MSD	WI-A06-S-24-0818MSD	580-80030-1MSD	Water
2	WI-A06-EB01-083018	580-80030-2	Water
3*	WI-A06-TB02-083018	580-80030-3	Water
4	WI-A06-S-24P-0818	580-80030-4	Water
5	WI-A06-EB02-083018	580-80030-5	Water

^{* -} VOC only

A full data validation was performed on the analytical data for two water samples, two aqueous equipment blank samples and one aqueous trip blank sample collected on August 30, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride)
USEPA SW-846 Method 8260C SIM
SVOC (1,4-Dioxane)
USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-083018	None - ND		3.53	57
WI-A06-TB02-083018	None - ND	5	3.50	50
WI-A06-EB02-083018	None - ND			180

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate recoveries.

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

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

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

Compound	WI-A06-S-24-0818 ug/L	WI-A06-S-24P-0818 ug/L	RPD	Qualifier
None	ND	ND		

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-083018	None - ND			5.75
WI-A06-EB02-083018	None - ND	191	5.	1.00

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

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 results are summarized below. The precision was acceptable.

Compound	WI-A06-S-24-0818 ug/L	WI-A06-S-24P-0818 ug/L	RPD	Qualifier
1,4-Dioxane	0.17	0.16	6%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information. Mancy Weaver Dated: 10/29/18

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J=	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle	Job No.: 580-80030-1				
SDG No.:					
Client Sample ID: W1-A06-S-24-0818	Lab Sample ID: 580-80030-1				
Matrix: Water	Lab File ID: 090618_030.D				
Analysis Method: 8260C SIM	Date Collected: 08/30/2018 12:25				
Sample wt/vol: 5(mL)	Date Analyzed: 09/07/2018 01:08				
Soil Aliquot Vol:	Dilution Factor: 1				
Soil Extract Vol.:	GC Column: DB-VRX ID: 0.25 (mm)				
% Moisture:	Level: (low/med) Low				
Analysis Batch No.: 283410	Units: ug/L				

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	116	116	
1868-53-7	Dibromofluoromethane (Surr)	104		80-120

Lab Name: TestAmerica Seattle

SDG No.:

Client Sample ID: W1-A06-EB01-083018

Matrix: Water

Analysis Method: 8260C SIM

Sample wt/vol: 5(mL)

Soil Aliquot Vol:

Soil Extract Vol.:

% Moisture:

Analysis Batch No.: 283410

Job No.: 580-80030-1

Lab Sample ID: 580-80030-2

Lab File ID: 090618_033.D

Date Collected: 08/30/2018 14:55

Date Analyzed: 09/07/2018 02:17

Dilution Factor: 1

GC Column: DB-VRX ID: 0.25 (mm)

Level: (low/med) Low

Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	FOÖ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	118		80-120
1868-53-7	Dibromofluoromethane (Surr)	104		80-120

Lab Name: TestAmerica Seattle Job No.: 580-80030-1

SDG No.:

Client Sample ID: WI-AO6-TB02-083018 Lab Sample ID: 580-80030-3

Matrix: Water Lab File ID: 090618 034.D

Analysis Method: 8260C SIM Date Collected: 08/30/2018 07:00

Sample wt/vol: 5(mL) Date Analyzed: 09/07/2018 02:40

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 283410 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	103		80-120

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Seattle Job No.: 580-80030-1 SDG No.: Client Sample ID: W1-A06-S-24P-0818 Lab Sample ID: 580-80030-4 Matrix: Water Lab File ID: 090618_035.D Analysis Method: 8260C SIM Date Collected: 08/30/2018 12:25 Sample wt/vol: 5(mL) Date Analyzed: 09/07/2018 03:03 Soil Aliquot Vol: Dilution Factor: 1 Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm) % Moisture: Level: (low/med) Low Analysis Batch No.: 283410 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.01

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	117	117	
1868-53-7	Dibromofluoromethane (Surr)	106		80-120

Lab Name: TestAmerica Seattle Job No.: 580-80030-1 SDG No.: Client Sample ID: W1-A06-EB02-083018 Lab Sample ID: 580-80030-5 Matrix: Water Lab File ID: 090618_036.D Analysis Method: 8260C SIM Date Collected: 08/30/2018 15:15 Sample wt/vol: 5(mL) Date Analyzed: 09/07/2018 03:26 Soil Aliquot Vol: Dilution Factor: 1 Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm) % Moisture: Level: (low/med) Low

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.01

Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	104		80-120
1868-53-7	Dibromofluoromethane (Surr)	110		80-120

Analysis Batch No.: 283410

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Date Collected: 08/30/2018 12:25

Dilution Factor: 1

GPC Cleanup: (Y/N) N

Lab Name: TestAmerica Seattle Job No.: 580-80030-1

SDG No .:

Client Sample ID: W1-A06-S-24-0818 Lab Sample ID: 580-80030-1

Matrix: Water

Lab File ID: 0914B007.D Analysis Method: 8270D SIM

Extract. Method: 3520C

Date Extracted: 09/05/2018 13:04 Sample wt/vol: 1046.4(mL) Date Analyzed: 09/14/2018 20:43

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture:

Analysis Batch No.: 284029 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.17	J	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	64		53-106

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab File ID: 0914B010.D

Dilution Factor: 1

GPC Cleanup: (Y/N) N

Date Extracted: 09/05/2018 13:04

Lab Name: TestAmerica Seattle Job No.: 580-80030-1

SDG No.:

Client Sample ID: W1-A06-EB01-083018 Lab Sample ID: 580-80030-2

Matrix: Water

Analysis Method: 8270D SIM Date Collected: 08/30/2018 14:55

Extract. Method: 3520C

Sample wt/vol: 955.6(mL) Date Analyzed: 09/14/2018 21:57

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture:

Analysis Batch No.: 284029 Units: ug/L

CAS NO. COMPOUND NAME RESULT Q LOQ DL

123-91-1 1,4-Dioxane 0.052 U 0.21 0.038

CAS NO	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	56		53-106

Lab Name: TestAmerica Seattle Job No.: 580-80030-1 SDG No.: Client Sample ID: W1-A06-S-24P-0818 Lab Sample ID: 580-80030-4 Matrix: Water Lab File ID: 0914B011.D Analysis Method: 8270D SIM Date Collected: 08/30/2018 12:25 Extract. Method: 3520C Date Extracted: 09/05/2018 13:04 Sample wt/vol: 1015.6(mL) Date Analyzed: 09/14/2018 22:22 Con. Extract Vol.: 2(mL) Dilution Factor: 1 Injection Volume: 1(uL) Level: (low/med) Low % Moisture: GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.16	J	0.20	0.035

Units: ug/L

CAS NO,	SURROGATE	%REC	Q LIMITS
367-12-4	2-Fluorophenol	63	53-106

Analysis Batch No.: 284029

Lab Name: TestAmerica Seattle

Job No.: 580-80030-1

SDG No.:

Client Sample ID: W1-A06-EB02-083018

Lab Sample ID: 580-80030-5

Matrix: Water

Lab File ID: 0914B012.D

Analysis Method: 8270D SIM

Date Collected: 08/30/2018 15:15

Extract. Method: 3520C

Date Extracted: 09/05/2018 13:04

Sample wt/vol: 1014.7(mL)

Date Analyzed: 09/14/2018 22:46

Con. Extract Vol.: 2(mL)

Dilution Factor: 1

Injection Volume: 1(uL)

Level: (low/med) Low

% Moisture:

GPC Cleanup: (Y/N) N

Analysis Batch No.: 284029

Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.049	U	0.20	0,035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	72		53-106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1802844

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 26, 2018

PFCs				
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix	
1	WI-A06-S-24-0818	1802844-01	Water	
1MS	WI-A06-S-24-0818MS	1802844-01MS	Water	
1MSD	WI-A06-S-24-0818MSD	1802844-01MSD	Water	
2	WI-A06-FB02-083018	1802844-02	Water	
3	WI-A06-EB01-083018	1802844-03	Water	
4	WI-A06-S-24P-0818	1802844-04	Water	
5	WI-A06-EB02-083018	1802844-05	Water	

A full data validation was performed on the analytical data for two water samples, two aqueous equipment blank samples, and one aqueous field blank sample collected on August 30, 2018 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

PFCs USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ng/L	-	
WI-A06-FB02-083018	None - ND	±	88	3
WI-A06-EB01-083018	None - ND		3.64	==\tag{2}
WI-A06-EB02-083018	None - ND	-	2:5	<u>-=</u> /

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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 results are summarized below. The precision was acceptable

		PFCs		
Compound	WI-A06-S-24-0718 ng/L	WI-A06-S-24P-0718 ng/L	RPD	Qualifier
PFBS	4.23	4.68	10%	None
PFHxA	12.5	12.2	2%	
PFHxS	16.4	13.9	17%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Senior Chemist

Clavey Weaver Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: V	VI-A06-S-24-0818								PFAS Iso	tope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base GW 6-S-24	Matrix: Date Col	Aqued lected: 30-At	ous 1g-18 12:25	Lab S	oratory Data Sample: Received:	1802844-0 01-Sep-18		Column	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	4.23	2.90	4.24	8.47	J	B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFHxA	307-24-4	12.5	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFHpA	375-85-9	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
PFHxS	355-46-4	16.4	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFOA	335-67-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFNA	375-95-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFOS	1763-23-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFDA	335-76-2	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
MeFOSAA	2355-31-9	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
EtFOSAA	2991-50-6	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFUnA	2058-94-8	ND	2.90	4.24	8.47		B8I0026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFDoA	307-55-1	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFTrDA	72629-94-8	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
PFTeDA	376-06-7	ND	2.90	4.24	8.47		B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	100		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	1
13C2-PFHxA	IS	93.9		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
13C4-PFHpA	IS	93.5		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
18O2-PFHxS	IS	98.2		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
13C2-PFOA	IS	89.5		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
13C5-PFNA	IS	85.7		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
13C8-PFOS	IS	96.6		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
13C2-PFDA	IS	75.9		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
d3-MeFOSAA	IS	93.1		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
d5-EtFOSAA	IS	92.0		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
13C2-PFUnA	IS	75.6		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	
13C2-PFDoA	IS	80.6		50 - 150			B8I0026	06-Sep-18	0,118 L	08-Sep-18 19:58	
13C2-PFTeDA	IS	99.9		50 - 150			B810026	06-Sep-18	0.118 L	08-Sep-18 19:58	

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

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

Work Order 1802844 Page 8 of 17



Sample ID: W	VI-A06-FB02-083018								PFAS Iso	tope Dilution !	Metho
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base GW 6-S-24	Matrix: Date Coll	Aqueo ected: 30-Aı	ous ig-18 12:25	Lab S	pratory Data Sample: Received:	1802844-0 01-Sep-18		Column	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilutio
PFBS	375-73-5	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
PFHxA	307-24-4	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFHpA	375-85-9	ND	2.88	4.20	8.42		B8I0026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFHxS	355-46-4	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFOA	335-67-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFNA	375-95-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFOS	1763-23-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFDA	335-76-2	ND	2.88	4.20	8.42		B8I0026	06-Sep-18	0.119 L	08-Sep-18 20:08	
MeFOSAA	2355-31-9	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
EtFOSAA	2991-50-6	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFUnA	2058-94-8	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFDoA	307-55-1	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFTrDA	72629-94-8	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
PFTeDA	376-06-7	ND	2.88	4.20	8.42		B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilutio
13C3-PFBS	IS	95.3		50 - 150			B8I0026	06-Sep-18	0.119 L	08-Sep-18 20:08	1
13C2-PFHxA	IS	94.1		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C4-PFHpA	IS	93.6		50 - 150			B8I0026	06-Sep-18	0.119 L	08-Sep-18 20:08	
18O2-PFHxS	IS	97.9		50 - 150			B8I0026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C2-PFOA	IS	89.5		50 - 150			B8I0026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C5-PFNA	IS	82.9		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C8-PFOS	IS	94.5		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C2-PFDA	IS	71.0		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
d3-MeFOSAA	IS	75.9		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
d5-EtFOSAA	IS	79.5		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C2-PFUnA	IS	69.5		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C2-PFDoA	IS	75.5		50 - 150			B8I0026	06-Sep-18	0.119 L	08-Sep-18 20:08	
13C2-PFTeDA	IS	93.5		50 - 150			B810026	06-Sep-18	0.119 L	08-Sep-18 20:08	-10

LOD - Limit of Detection LOQ - Limit of quantitation



Sample ID: V	VI-A06-EB01-083018								PFAS Iso	otope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base GW pump	Matrix: Date Col	Aque lected: 30-A	ous ug-18 14:55	Lab S	oratory Data Sample: Received:	1802844-01-Sep-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
PFHxA	307-24-4	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFHpA	375-85-9	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFHxS	355-46-4	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFOA	335-67-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFNA	375-95-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFOS	1763-23-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFDA	335-76-2	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
MeFOSAA	2355-31-9	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
EtFOSAA	2991-50-6	ND	3.01	4.39	8.78		B8I0026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFUnA	2058-94-8	ND	3.01	4.39	8.78		B8I0026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFDoA	307-55-1	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFTrDA	72629-94-8	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
PFTeDA	376-06-7	ND	3.01	4.39	8.78		B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
Labeled Standar		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS.	98.8		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C2-PFHxA	IS	96.5		50 - 150			B8I0026	06-Sep-18	0.114 L	08-Sep-18 20:19	
13C4-PFHpA	IS	97.4		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	
18O2-PFHxS	IS	97.1		50 - 150			B8I0026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C2-PFOA	IS	90.2		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C5-PFNA	IS	81.9		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C8-PFOS	IS	98.3		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C2-PFDA	IS	73.0		50 - 150			B8I0026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
d3-MeFOSAA	IS	77.9		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
d5-EtFOSAA	IS	75.7		50 - 150			B8I0026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C2-PFUnA	IS	70.7		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C2-PFDoA	IS	73.0		50 - 150			B8I0026	06-Sep-18	0.114 L	08-Sep-18 20:19	1
13C2-PFTeDA	IS	81.8		50 - 150			B810026	06-Sep-18	0.114 L	08-Sep-18 20:19	1

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



Sample ID: V	VI-A06-S-24P-0818								PFAS Iso	tope Dilution !	Method
Client Data Name: Project; Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base GW 6-S-24	Matrix: Date Coll	Aquedected: 30-Au	ous 1g-18 12:25	Lab S	oratory Data Sample: Received:	1802844-0 01-Sep-18		Column	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	4.68	2.97	4.35	8.69	J	B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFHxA	307-24-4	12.2	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	
PFHpA	375-85-9	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	
PFHxS	355-46-4	13.9	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	
PFOA	335-67-1	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	
PFNA	375-95-1	ND	2.97	4.35	8.69		B8I0026	06-Sep-18	0.115 L	08-Sep-18 20:30	
PFOS	1763-23-1	ND	2.97	4.35	8.69		B8I0026	06-Sep-18	0.115 L	08-Sep-18 20:30	
PFDA	335-76-2	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	
MeFOSAA	2355-31-9	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
EtFOSAA	2991-50-6	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	î
PFUnA	2058-94-8	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	î
PFDoA	307-55-1	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	i
PFTrDA	72629-94-8	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
PFTeDA	376-06-7	ND	2.97	4.35	8.69		B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	i
Labeled Standar		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	ls .	95.5		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFHxA	IS	93.5		50 - 150			B8I0026	06-Sep-18	0.115 L	08-Sep-18 20:30	10
13C4-PFHpA	IS	91.1		50 - 150			B8I0026	06-Sep-18	0.115 L	08-Sep-18 20:30	4
18O2-PFHxS	IS	100		50 - 150			B8I0026	06-Sep-18	0.115 L	08-Sep-18 20:30	i
13C2-PFOA	IS	90.8		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C5-PFNA	IS	87.9		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	i
13C8-PFOS	IS	99.6		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFDA	IS	74.8		50 - 150			B8I0026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
d3-MeFOSAA	IS	85.8		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
d5-EtFOSAA	IS	83.0		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFUnA	IS	75.4		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	i
13C2-PFDoA	IS	83.3		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1
13C2-PFTeDA	IS	101		50 - 150			B810026	06-Sep-18	0.115 L	08-Sep-18 20:30	1

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



Page 13 of 17

Sample ID: W	/I-A06-EB02-083018								PFAS Iso	tope Dilution	Method
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base GW tubing	Matrix: Date Coll	Aque ected; 30-A	ous ug-18 15:15	Lab S	oratory Data Sample: Received:	1802844-0 01-Sep-18		Column	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1
PFHxA	307-24-4	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFHpA	375-85-9	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFHxS	355-46-4	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFOA	335-67-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFNA	375-95-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFOS	1763-23-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFDA	335-76-2	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
MeFOSAA	2355-31-9	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
EtFOSAA	2991-50-6	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFUnA	2058-94-8	ND	2.85	4.17	8.32		B8I0026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFDoA	307-55-1	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFTrDA	72629-94-8	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
PFTeDA	376-06-7	ND	2.85	4.17	8.32		B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C3-PFBS	IS	92.2		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	4
13C2-PFHxA	IS	90.4		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C4-PFHpA	IS	89.2		50 - 150			B8I0026	06-Sep-18	0.120 L	08-Sep-18 20:40	
18O2-PFHxS	IS	91.4		50 - 150			B8I0026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C2-PFOA	IS	86.7		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C5-PFNA	IS	83.1		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C8-PFOS	IS	92.9		50 - 150			B8I0026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C2-PFDA	IS	76.2		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
d3-MeFOSAA	IS	90.3		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
d5-EtFOSAA	IS	88.3		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C2-PFUnA	IS	75.6		50 - 150			B8I0026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C2-PFDoA	IS	81.4		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	
13C2-PFTeDA	IS	95.6		50 - 150			B810026	06-Sep-18	0.120 L	08-Sep-18 20:40	1

DL - Detection Limit

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-83545-1

Laboratory: Test America Laboratories, Tacoma, Washington

Site: NAS Whidbey Island, Area 06, CTO-4041, Washington

Date: February 26, 2019

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-S-12-0119	580-83545-1	Water
1MS	WI-A06-S-12-0119MS	580-83545-1MS	Water
1MSD	WI-A06-S-12-0119MSD	580-83545-1MSD	Water
2	WI-A06-S-12P-0119	580-83545-2	Water
3	WI-A06-EB01-012319	580-83545-3	Water
4*	TRIP BLANK 01	580-83545-4	Water

* - VOC only

A full data validation was performed on the analytical data for two water samples, one aqueous equipment blank sample, and one aqueous trip blank sample collected on January 23, 2019 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

Holding times and sample preservation

- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is 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.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-012319	None - ND		E E	125
TRIP BLANK 01	None - ND	ia i	2	78

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate recoveries.

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 ID	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	Vinyl Chloride	OK/OK/69	None	For RPD Alone

Laboratory Control Samples

• 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 results are summarized below.

Compound	WI-A06-S-12-0119 ug/L	WI-A06-S-12P-0119 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND	-	182

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-012319	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 ID	Compound	MS %R/MSD %R/RPD	Qualifier	Affected Samples
1	1,4-Dioxane	22%/OK/OK	J	1

Laboratory Control Samples

• 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 results are summarized below.

Compound	WI-A06-S-12-0119 ug/L	WI-A06-S-12P-0119 ug/L	RPD	Qualifier
1,4-Dioxane	3.8	3.7	3%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Nancy Weaver Senior Chemist

llancy Weaver Dated: 2/26/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J=:	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-83545-1

SDG No.:

Client Sample ID: WI-A06-S-12-0119 Lab Sample ID: 580-83545-1

Matrix: Water Lab File ID: 012819 011.D

Analysis Method: 8260C SIM Date Collected: 01/23/2019 12:00

Sample wt/vol: 5(mL) Date Analyzed: 01/28/2019 13:24

Soil Aliquot Vol: Dilution Factor: 1

Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm)

% Moisture: Level: (low/med) Low

Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	105		80-120
1868-53-7	Dibromofluoromethane (Surr)	93		80-120

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET



Lab Name: TestAmerica Seattle Job No.: 580-83545-1

SDG No.:

Client Sample ID: WI-A06-S-12P-0119 Lab Sample ID: 580-83545-2

Matrix: Water

Analysis Method: 8260C SIM Date Collected: 01/23/2019 12:30

Sample wt/vol: 5(mL)

Dilution Factor: 1

Lab File ID: 012819_014.D

Soil Aliquot Vol:
Soil Extract Vol.:

GC Column: DB-VRX ID: 0.25 (mm)

Date Analyzed: 01/28/2019 15:05

% Moisture:

Level: (low/med) Low

Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	103		80-120
1868-53-7	Dibromofluoromethane (Surr)	93		80-120

Lab Name: TestAmerica Seattle Job No.: 580-83545-1 SDG No.: Client Sample ID: WI-A06-EB01-012319 Lab Sample ID: 580-83545-3 Matrix: Water Lab File ID: 012819 015.D Analysis Method: 8260C SIM Date Collected: 01/23/2019 14:00 Sample wt/vol: 5(mL) Date Analyzed: 01/28/2019 15:29 Soil Aliquot Vol: Dilution Factor: 1 Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm) % Moisture: Level: (low/med) Low Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	100		80-120
1868-53-7	Dibromofluoromethane (Surr)	94		80-120

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: TestAmerica Seattle Job No.: 580-83545-1 SDG No.: Client Sample ID: Trip Blank 01 Lab Sample ID: 580-83545-4 Matrix: Water Lab File ID: 012819 022.D Analysis Method: 8260C SIM Date Collected: 01/23/2019 10:00 Sample wt/vol: 5(mL) Date Analyzed: 01/28/2019 15:52 Soil Aliquot Vol: Dilution Factor: 1 Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm) % Moisture: Level: (low/med) Low Analysis Batch No.: 293736 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	99		80-120
1868-53-7	Dibromofluoromethane (Surr)	99		80-120

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-83545-1

SDG No.:

Client Sample ID: WI-A06-S-12-0119 Lab Sample ID: 580-83545-1

Matrix: Water Lab File ID: 013019ADEC012.D

Analysis Method: 8270D SIM Date Collected: 01/23/2019 12:00

Extract. Method: 3520C Date Extracted: 01/28/2019 09:27

Sample wt/vol: 1046.5(mL) Date Analyzed: 01/30/2019 17:02

Con. Extract Vol.: 2(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: GPC Cleanup: (Y/N) N

Analysis Batch No.: 293938 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT		Q	LOQ	DL	
123-91-1	1,4-Dioxane	3.8	1	15	0.19	0.034	MSL

 CAS NO.
 SURROGATE
 %REC
 Q
 LIMITS

 367-12-4
 2-Fluorophenol
 74
 53-106

Lab File ID: 013019ADEC015.D

Dilution Factor: 1

Lab Name: TestAmerica Seattle Job No.: 580-83545-1

SDG No.:

Client Sample ID: WI-A06-S-12P-0119 Lab Sample ID: 580-83545-2

Matrix: Water

Analysis Method: 8270D SIM Date Collected: 01/23/2019 12:30

Extract. Method: 3520C

Date Extracted: 01/28/2019 09:27 Sample wt/vol: 1039.6(mL) Date Analyzed: 01/30/2019 18:08

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: GPC Cleanup: (Y/N) N

Analysis Batch No.: 293938 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	3.7	p	0.19	0.035

CAS NO.	SURROGATE	%REC	Q LIMITS
367-12-4	2-Fluorophenol	79	53-106

Lab Name: TestAmerica Seattle

SDG No.:

Client Sample ID: WI-A06-EB01-012319

Matrix: Water

Analysis Method: 8270D SIM

Extract. Method: 3520C

Sample wt/vol: 1025.8(mL)

Con. Extract Vol.: 2(mL)

Injection Volume: 1(uL)

% Moisture:

Analysis Batch No.: 293938

Job No.: 580-83545-1

Lab Sample ID: 580-83545-3

Lab File ID: 013019ADEC016.D

Date Collected: 01/23/2019 14:00

Date Extracted: 01/28/2019 09:27

Date Analyzed: 01/30/2019 18:30

Dilution Factor: 1

Level: (low/med) Low

GPC Cleanup: (Y/N) N

Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.049	U M Q	0.19	0.035

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-FluorophenoI	74		53-106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

1900195

Laboratory:

Vista Analytical Laboratory, El Dorado Hills, California

Site:

NAS Whidbey Island, Area 06, CTO-4041, Washington

Date: F

February 26, 2019

		PFCs	
EDS ID	Client Sample IID	Laboratory Sample ID	Matrix
1	WI-A06-S-12-0119	1900195-01	Water
1MS	WI-A06-S-12-0119MS	1900195-01MS	Water
1MSD	WI-A06-S-12-0119MSD	1900195-01MSD	Water
2	WI-A06-S-12P-0119	1900195-02	Water
3	WI-A06-FB01-012319	1900195-03	Water
4	WI-A06-EB01-012319	1900195-04	Water

A full data validation was performed on the analytical data for two water samples, one aqueous field blank sample and one equipment blank sample collected on January 23, 2019 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:

<u>Analysis</u> PFCs Method References

USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is 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 Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ng/L		
WI-A06-EB01-012319	None - ND	ND	-	
WI-A06-FB01-012319	None - ND	ND	-	

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate %R values.

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 except the following. The ion ratios were outside the 70 - 130% QC limits for PFBS and PFHpA in EDS sample #2. Both compounds were qualified estimated (J).

Field Duplicate Sample Precision

Field duplicate results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-A06-S-12-0119 ng/L	WI-A06-S-12P-0119 ng/L	RPD	Qualifie
PFBS	9.44	9.32	1%	None
PFHxA	29.3	27.6	6%	
PFHpA	ND	4.01	NC	
PFHxS	14.2	12.6	12%	
PFOA	24.0	22.0	9%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 2/26/19

Senior Chemist

Data Qualifier	Definition						
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.						
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.						
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.						
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.						
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.						



Sample ID: W	VI-A06-S-12-0119								PFAS Iso	tope Dilution	lution Method	
Client Data Name: Project: Location:	CH2M Hill Navy Clean CTO: 4041 NASWI AQ	Matrix: Date Coll	Aque ected: 23-Ja	eous an-19 12:00	Lab S	Sample: Received:	1900195-(25-Jan-19		Column:	BEH C18		
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	9.44	3.20	4,67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFHxA	307-24-4	29.3	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFHpA	375-85-9	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFHxS	355-46-4	14.2	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFOA	335-67-1	24.0	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFNA	375-95-1	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFOS	1763-23-1	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50		
PFDA	335-76-2	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
MeFOSAA	2355-31-9	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
EtFOSAA	2991-50-6	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	Î	
PFUnA	2058-94-8	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	i	
PFDoA	307-55-1	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFTrDA	72629-94-8	ND	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
PFTeDA	376-06-7	NĐ	3.20	4.67	9.34		B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	90.5		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
13C2-PFHxA	18	85.3		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
13C4-PFHpA	IS	85.7		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
18O2-PFHxS	IS	95.0		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
13C2-PFOA	IS	88.1		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	Î	
13C5-PFNA	IS	81.1		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	Î	
13C8-PFOS	IS	77.6		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
13C2-PFDA	IS	68.9		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
d3-MeFOSAA	IS	66.7		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
d5-EtFOSAA	IS	70.3		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
13C2-PFUnA	IS	69.6		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
13C2-PFDoA	IS	67.3		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	
13C2-PFTeDA	IS	77.7		50 - 150			B9A0222	29-Jan-19	0.107 L	30-Jan-19 16:50	1	

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.



Sample ID: W	I-A06-S-12P-0119						PFAS Isotope Dilution				Method
Client Data Name: Project: Location:	CH2M Hill Navy Clean CTO: 4041 NASWI AQ	Matrix: Date Colle		Aqueous 3-Jan-19 12:30	Lab	oratory Data Sample: e Received:	1900195-0 25-Jan-19		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	9.32 🗾	3.29	4.81	9.61	LO	B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFHxA	307-24-4	27.6	3,29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFHpA	375-85-9	4.01 🤳	3.29	4.81	9.61	1.0	B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFHxS	355-46-4	12.6	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFOA	335-67-1	22.0	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFNA	375-95-1	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFOS	1763-23-1	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFDA	335-76-2	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
MeFOSAA	2355-31-9	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	î Î
EtFOSAA	2991-50-6	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	i
PFUnA	2058-94-8	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFDoA	307-55-1	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFTrDA	72629-94-8	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
PFTeDA	376-06-7	ND	3.29	4.81	9.61		B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	ii
Labeled Standard		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	95.0		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C2-PFHxA	IS	91.0		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C4-PFHpA	IS	88.3		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
18O2-PFHxS	IS	92.3		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C2-PFOA	IS	87.8		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	t
13C5-PFNA	IS	81:7		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C8-PFOS	IS	80.8		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C2-PFDA	IS	79.7		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
d3-MeFOSAA	IS	74.2		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
d5-EtFOSAA	IS	67.2		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C2-PFUnA	18	74.4		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C2-PFDoA	IS	71.1		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1
13C2-PFTeDA	IS	53.2		50 - 150			B9A0222	29-Jan-19	0.104 L	30-Jan-19 17:00	1

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



Sample ID: W	I-A06-FB01-012319		=						PFAS Iso	otope Dilution Method		
Client Data Name: Project: Location:	CH2M Hill Navy Clean CTO: 4041 NASWI WW	Matrix: Date Coll	Aque ected 23-Ja	ous an-19 12:00	Lab :	Sample: Received:	1900195-0 25-Jan-19		Column:	BEH C18		
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS	375-73-5	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFHxA	307-24-4	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	Ĭ	
PFHpA	375-85-9	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFHxS	355-46-4	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFOA	335-67-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFNA	375-95-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFOS	1763-23-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFDA	335-76-2	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
MeFOSAA	2355-31-9	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	î	
EtFOSAA	2991-50-6	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFUnA	2058-94-8	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFDoA	307-55-1	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
PFTrDA	72629-94-8	ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	I	
PFTeDA	376-06-7	ND ND	3.00	4.39	8.76		B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
Labeled Standard		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C3-PFBS	IS	95.4		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C2-PFHxA	IS	93.3		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C4-PFHpA	IS	90.6		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
18O2-PFHxS	IS	91.6		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C2-PFOA	IS	93.0		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C5-PFNA	1S	77.2		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C8-PFOS	IS	98.8		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	- 1	
13C2-PFDA	IS	75.5		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	I	
d3-MeFOSAA	IS	76.9		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
d5-EtFOSAA	IS	79.7		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C2-PFUnA	IS	72.2		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C2-PFDoA	IS	70.7		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	
13C2-PFTeDA	IS	87.0		50 - 150			B9A0222	29-Jan-19	0.114 L	30-Jan-19 17:11	1	

LOD - Limit of Detection

LOQ - Limit of quantitation

Results reported to the DL.



Sample ID: V	VI-A06-EB01-012319								PFAS Iso	tope Dilution	Method
Client Data Name: CH2M Hill Project: Navy Clean CTO: 4041 NASWI Location: WW		Matrix: Aqueous Date Collected: 23-Jan-19 14:00			Laboratory Data Lab Sample: Date Received:		1900195-04 25-Jan-19 09:15		Column	ВЕН С18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFHxA	307-24-4	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFHpA	375-85-9	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFHxS	355-46-4	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFOA	335-67-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFNA	375-95-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFOS	1763-23-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFDA	335-76-2	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
MeFOSAA	2355-31-9	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.1131	30-Jan-19 17:22	1
EtFOSAA	2991-50-6	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	Î
PFUnA	2058-94-8	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	Ī
PFDoA	307-55-1	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFTrDA	72629-94-8	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
PFTeDA	376-06-7	ND	3.02	4.42	8.83		B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	I
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	93.8		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	I
13C2-PFHxA	IS	90.8		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
13C4-PFHpA	IS	91.4		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
18O2-PFHxS	IS	91.2		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
13C2-PFOA	IS	83.7		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
13C5-PFNA	IS	84.5		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
13C8-PFOS	IS	101		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
13C2-PFDA	IS	84.8		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
d3-MeFOSAA	IS	81.8		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
d5-EtFOSAA	IS	83.9		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	Í
13C2-PFUnA	IS	81.4		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	ī
13C2-PFDoA	IS	83.3		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1
13C2-PFTeDA	IS	89.8		50 - 150			B9A0222	29-Jan-19	0.113 L	30-Jan-19 17:22	1

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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Attachment 5 Raw Data and Data Validation Forms for Drinking Water and Private Groundwater Well Samples



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-74975-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW01-0218	580-74975-1	Water
2	WI-A06-RW02-0218	580-74975-2	Water
3	WI-A06-RW03-0218	580-74975-3	Water
4	WI-A06-RW04-0218	580-74975-4	Water
5*	WI-A06-RW05-0218	580-74975-5	Water
6*	WI-A06-RW05P-0218	580-74975-6	Water
7*	WI-A06-RW06-0218	580-74975-7	Water
8*	WI-A06-RW07-0218	580-74975-8	Water
9*	WI-A06-RW08-0218	580-74975-9	Water
10*	WI-A06-TB01-0218	580-74975-10	Water

* - VOC only

A full data validation was performed on the analytical data for nine water samples and one aqueous trip blank sample collected on February 5-6, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

<u>Analysis</u> <u>Method References</u>

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-0218	None - ND	4	- 4	E .

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate recoveries.

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

• MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

		VOC		
Compound	WI-A06-RW05-0218 ug/L	WI-A06-RW05P-0218 ug/L	RPD	Qualifier
None	ND	ND		

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC samples were not analyzed.

Surrogate Spike Recoveries

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

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

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 analyzed.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 5/15/18 Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Date Sampled: 02/05/2018 1506

TAC036

021318_08.D

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW01-0218

Lab Sample ID: 580-74975-1

Client Matrix: Water Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

N/A

580-267202

Instrument ID:

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Lab File ID:

Analysis Method: 8260C SIM Prep Method:

5030B 1.0

Dilution: Analysis Date: 02/13/2018 1238

Prep Date: 02/13/2018 1238

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Analysis Batch:

Prep Batch:

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 100 80 - 141 Dibromofluoromethane (Surr) 101 Ŋŧ 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW02-0218

Lab Sample ID: Client Matrix:

580-74975-2

Water

Date Sampled: 02/05/2018 1538 Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

1.0

Dilution:

Analysis Date: Prep Date:

02/13/2018 1301 02/13/2018 1301 Analysis Batch: Prep Batch:

580-267202

N/A

Instrument ID: Lab File ID:

TAC036 021318_09.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 UM 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 99 80 - 141 Dibromofluoromethane (Surr) 100 M 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-74975-1

W1-A06-RW03-0218 Client Sample ID:

Lab Sample ID: 580-74975-3 Date Sampled: 02/05/2018 1611 Client Matrix: Water Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Prep Method: 5030B

Dilution: 1.0

Analysis Date: 02/13/2018 1325

Prep Date:

02/13/2018 1325

Prep Batch:

580-267202

N/A

Instrument ID:

TAC036 Lab File ID: 021318_10.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 U 0.013 0.50

Analysis Batch:

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 100 80 - 141 Dibromofluoromethane (Surr) 102 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW04-0218

> 580-74975-4 Date Sampled: 02/05/2018 1650 Water Date Received: 02/08/2018 0925

> > 8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Lab Sample ID:

Client Matrix:

Dilution: 1.0

Analysis Date: 02/13/2018 1349

Prep Date: 02/13/2018 1349

Analysis Batch: 580-267202 Instrument ID: TAC036 Prep Batch: N/A Lab File ID: 021318_11.D Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) DL Qualifier LOQ Vinyl chloride 0.040 U 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 100 80 - 141 Dibromofluoromethane (Surr) 101 M 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW05-0218

Lab Sample ID: 580-74975-5

Client Matrix: Water Date Sampled: 02/06/2018 1008 Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: Prep Date:

02/13/2018 1413

02/13/2018 1413

Analysis Batch: 580-267202 Prep Batch:

N/A

Instrument ID: Lab File ID:

TAC036 021318_12.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) DL Qualifier LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 100 80 - 141 M Dibromofluoromethane (Surr) 102 77 - 118

6

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW05P-0218

> Date Sampled: 02/06/2018 1008 Date Received: 02/08/2018 0925

Lab Sample ID: Client Matrix:

580-74975-6

Water

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Prep Batch:

Dilution: 1.0 Analysis Date:

02/13/2018 1436

Prep Date:

02/13/2018 1436

Analysis Batch: 580-267202

N/A

Instrument ID: Lab File ID:

TAC036 021318_13.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte	Result (ug/L)	Qualifier	DL	LOQ
Vinyl chloride	0.040	U	0.013	0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 98 80 - 141 Dibromofluoromethane (Surr) 101 M 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID:

W1-A06-RW06-0218

Lab Sample ID: Client Matrix:

580-74975-7

Water

Date Sampled: 02/06/2018 1056 Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-267202

Instrument ID:

TAC036

Prep Method: Dilution:

5030B

Prep Batch:

Lab File ID:

1.0

N/A

Initial Weight/Volume: 5 mL

021318_14.D

Analysis Date:

02/13/2018 1500

Final Weight/Volume: 5 mL

Prep Date:

02/13/2018 1500

Analyte Vinyl chloride

Result (ug/L) Qualifier U

DL 0.013 LOQ 0.50

Surrogate

%Rec 97 102

0.040

Qualifier

80 - 141 77 - 118

Acceptance Limits

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

M

Page 28 of 506 slyle un

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW07-0218

Lab Sample ID: 580-74975-8

Client Matrix: Water Date Sampled: 02/06/2018 1405 Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method:

5030B

Dilution:

1.0

Analysis Date: Prep Date:

02/13/2018 1524

02/13/2018 1524

Analysis Batch: Prep Batch:

580-267202 N/A

Instrument ID:

TAC036 Lab File ID: 021318_15.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 99 80 - 141 M Dibromofluoromethane (Surr) 102 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID:

W1-A06-RW08-0218

Lab Sample ID:

580-74975-9

Client Matrix:

Water

Date Sampled: 02/06/2018 1802 Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:

8260C SIM

Analysis Batch:

580-267202

Instrument ID:

TAC036

Prep Method:

5030B

Dilution:

Prep Batch:

N/A

Lab File ID:

021318_16.D

1.0

Initial Weight/Volume: 5 mL

Analysis Date:

02/13/2018 1548

Final Weight/Volume: 5 mL

Prep Date:

02/13/2018 1548

Analyte

Vinyl chloride

Result (ug/L) 0.040

Qualifier

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr) %Rec 100 104

Qualifier

Acceptance Limits

80 - 141 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

10

Client Sample ID:

W1-A06-TB01-0218

Lab Sample ID:

580-74975-10

Client Matrix:

Water

Date Sampled: 02/05/2018 0800 Date Received: 02/08/2018 0925

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-267202

Instrument ID:

TAC036

Prep Method:

5030B

Dilution:

Prep Batch:

N/A

Lab File ID:

1.0

Initial Weight/Volume: 5 mL

021318_17.D

Analysis Date:

02/13/2018 1611

Final Weight/Volume: 5 mL

Prep Date:

02/13/2018 1611

Result (ug/L)

Qualifier

DL 0.013 LOQ 0.50

Vinyl chloride

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

Surrogate

Analyte

0.040

Qualifier

Acceptance Limits

%Rec 99

102

M

80 - 141 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW01-0218

Lab Sample ID: 580-74975-1 Date Sampled: 02/05/2018 1506 Client Matrix: Water Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

580-267316

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date: 02/14/2018 1842 Prep Date: 02/12/2018 1053 Prep Batch: 580-267129

Instrument ID: Lab File ID: Initial Weight/Volume: 1036.5 mL

TAC051 0214B012.D

Final Weight/Volume: 2 mL Injection Volume: 2 uL

Analyte Result (ug/L) Qualifier DL LOQ 1,4-Dioxane 0.029 0.011 0.096

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 75 53 - 106

Analysis Batch:

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID:

W1-A06-RW02-0218

Lab Sample ID:

580-74975-2

Client Matrix:

Water

Date Sampled: 02/05/2018 1538 Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-267316

Instrument ID:

TAC051

Prep Method:

3520C

Prep Batch:

580-267129

Lab File ID:

Dilution:

1.0

0214B013.D

Analysis Date:

Initial Weight/Volume:

1029.9 mL

02/14/2018 1907

Final Weight/Volume: Injection Volume:

2 mL

Prep Date:

02/12/2018 1053

DL

LOQ

Analyte 1,4-Dioxane

Result (ug/L) 0.029

Qualifier U

0.011

0.097

Surrogate 2-Fluorophenol %Rec

Qualifier

Acceptance Limits

86

53 - 106

Client: CH2M Hill, Inc. Job Number: 580-74975-1

Client Sample ID: W1-A06-RW03-0218

Lab Sample ID:

580-74975-3

Client Matrix: Water Date Sampled: 02/05/2018 1611 Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM

3520C

Analysis Batch:

580-267316

Instrument ID:

TAC051

Prep Method: Dilution:

1.0

Prep Batch:

580-267129

Lab File ID:

0214B014.D

Analysis Date:

Initial Weight/Volume: 1030.2 mL

Prep Date:

02/14/2018 1932 02/12/2018 1053 Final Weight/Volume: Injection Volume:

2 mL 2 uL

Analyte 1,4-Dioxane

Result (ug/L) 0.081

Qualifier JM

DL 0.011 LOQ 0.097

Surrogate 2-Fluorophenol

%Rec

Qualifier

Acceptance Limits

74

53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-74975-1

Client Sample ID:

W1-A06-RW04-0218

Lab Sample ID:

580-74975-4

Client Matrix:

Water

Date Sampled: 02/05/2018 1650 Date Received: 02/08/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: Prep Method:

8270D SIM 3520C

1.0

Analysis Batch: Prep Batch:

580-267316 580-267129

Instrument ID:

TAC051 0214B015.D

Lab File ID:

Initial Weight/Volume: 1025.4 mL

Final Weight/Volume: 2 mL Injection Volume:

2 uL

Prep Date:

Analysis Date:

02/14/2018 1957 02/12/2018 1053

Result (ug/L)

Qualifier

DL

LOQ 0.098

Analyte 1,4-Dioxane

Dilution:

0.029

0.011

Surrogate 2-Fluorophenol

%Rec 78

Qualifier

Acceptance Limits

53 - 106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800274

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW01-0218	1800274-01	Water
2	WI-A06-FB01-0218	1800274-02	Water
3	WI-A06-RW02-0218	1800274-03	Water
4	WI-A06-FB02-0218	1800274-04	Water
5	WI-A06-RW03-0218	1800274-05	Water
6	WI-A06-FB03-0218	1800274-06	Water
7	WI-A06-RW04-0218	1800274-07	Water
8	WI-A06-FB04-0218	1800274-08	Water
9	WI-A06-RW05-0218	1800274-09	Water
10	WI-A06-FB05-0218	1800274-10	Water
11	WI-A06-RW06-0218	1800274-11	Water
12	WI-A06-RW05P-0218	1800274-12	Water
13	WI-A06-FB06-0218	1800274-13	Water
14	WI-A06-RW07-0218	1800274-14	Water
15	WI-A06-FB07-0218	1800274-15	Water
16	WI-A06-RW08-0218	1800274-16	Water
17	WI-A06-FB08-0218	1800274-17	Water

A full data validation was performed on the analytical data for nine water samples and eight aqueous field blanks sample collected on February 5-6, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

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.

GC/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 exhibited the following contamination.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
B8B0104-BLK1	PFHxA	0.685	U	1, 3, 6, 7, 10, 13, 15

Field QC Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB01-0218	None - ND	720	2	<u> </u>
WI-A06-FB02-0218	None - ND			= = = = = = = = = = = = = = = = = = =
WI-A06-FB03-0218	None - ND	55.	-	5
WI-A06-FB04-0218	None - ND	S#1	-	5
WI-A06-FB05-0218	None - ND	3.00	-	# # # # # # # # # # # # # # # # # # #
WI-A06-FB06-0218	None - ND	3 5 3	+	8
WI-A06-FB07-0218	None - ND	;=·	-	×
WI-A06-FB08-0218	None - ND	(%)	1-	<u> </u>

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate %R values.

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

• MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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.

Target Compound Identification

• All mass spectra and quantitation criteria were met.

Compound Quantitation

• EDS Samples 9 and 12 were analyzed at a 2X dilution for PFHxS due to high concentrations. The reporting limits were adjusted accordingly. No action was taken.

Field Duplicate Sample Precision

• Field duplicate results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-A06-RW05-0218 ng/L	WI-A06-RW05P-0218 ng/L	RPD	Qualifier
PFBS	28.9	28.9	0%	None
PFHxA	48.6	49.8	2%	
PFHpA	20.2	21.4	6%	
PFHxS	210	232	10%	
PFOA	57.7	55.3	4%	
PFNA	4.98U	1.67	NC	
PFOS	64.1	63.8	0%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Maney Weaver

Senior Chemist

Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



537	tho	EPA Met										01-0218	Sample ID: WI-A
		BEH C18	Column:		1800274-0 08-Feb-18	ratory Data ample: Received:	Lab S	king Water eb-18 15:06		Matrix: Date Collec		ch2M Hill CLEAN CTO-4041 WHIDBEY ISLAND	
ution	D	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	nc. (ng/L)	Con		Analyte
1	00	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	0.466	ND			FBS
1	00	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104	LB.	10.5	5.25	0.698	0.813	5.25		FHxA
1	Ю	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	0.561	ND			FHpA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	0.437	ND			FHxS
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	1.14	ND			FOA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	1.52	ND			FNA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	1.09	ND			FOS
Ĭ	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	1.35	ND			FDA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	3.20	ND			leFOSAA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	2.03	ND			tFOSAA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	0.268	ND			FUnA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	1.00	ND			FDoA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	0.992	ND			FTrDA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104		10.5	5.25	0.818	ND			FTeDA
tion		Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		∕₀ Recovery	%	Туре	abeled Standards
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104			70 - 130		97.4		SURR	3C2-PFHxA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104			70 - 130		88.3		SURR	3C2-PFDA
1	0	23-Feb-18 17:00	0.238 L	16-Feb-18	B8B0104			70 - 130		102		SURR	5-EtFOSAA

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

nuslizh 8



Sample ID: V	VI-A06-FB01-0218									EPA Meth	od 537	
Client Data Name: CH2M Hill Project: CLEAN CTO-4041 WHIDBEY ISLAND		Matrix: Drinking Water			Lab S	Laboratory Data Lab Sample: 1800274-02 Date Received: 08-Feb-18 09:03			Column: BEH C18			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS		ND	0.435	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFHxA		ND	0.651	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFHpA		ND	0.523	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFHxS		ND	0.408	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFOA		ND	1.06	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFNA		ND	1.41	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFOS		ND	1.02	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFDA		ND	1.26	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
MeFOSAA		ND	2.99	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
EtFOSAA		ND	1.90	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFUnA		ND	0.250	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFDoA		ND	0.935	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	I	
PFTrDA		ND	0.926	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
PFTeDA		ND	0.763	4.90	9.82		B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution	
13C2-PFHxA	SURR	101		70 - 130			B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
13C2-PFDA	SURR	98.0		70 - 130			B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	
d5-EtFOSAA	SURR	109		70 - 130			B8B0104	16-Feb-18	0.255 L	23-Feb-18 17:13	1	

LOD - Limit of Detection LOQ - Limit of quantitation LCL-UCL- Lower control limit - upper control limit Results reported to the DL_{*}



Sample ID: V	VI-A06-RW02-0218										EPA Meth	od 537	
Client Data						Lab	oratory Data						t
Name:	CH2M Hill		Matrix:	П	Drinking Water	Lab	Sample:	1800274-0)3	Column:	BEH C18		ı
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	•	Date Collec)5-Feb-18 15:38		e Received:	08-Feb-18	09:03		DETTCTO		
Analyte		Conc.	(ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	1
PFBS			ND	0.445	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
PFHxA		5.02 6	1,020 L	0.666	5.02	10.1	J-B-	B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	In
PFHpA			ND	0.536	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	Г
PFHxS			1.31	0.417	5.02	10.1	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
PFOA			ND	1.09	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	Ī	1
PFNA			ND	1.45	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	Ĩ	1
PFOS			ND	1.05	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
PFDA			ND	1.29	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
MeFOSAA			ND	3.06	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
EtFOSAA			ND	1.94	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	I
PFUnA			ND	0.256	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	Î	1
PFDoA			ND	0.957	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
PFTrDA			ND	0.948	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
PFTeDA			ND	0.781	5.02	10.1		B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
Labeled Standa	rds Type	% F	lecovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	Γ
13C2-PFHxA	SURR		101		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	Ī
13C2-PFDA	SURR	8	39.3		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	1
d5-EtFOSAA	SURR	9	90.7		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 17:25	1	

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



Sample ID:	WI-A06-FB02-0218									EPA Meth	nod 537	
Client Data Name: CH2M Hill Project: CLEAN CTO-4041 WHIDBEY ISLAND		Matrix: Date Coll	Matrix: Drinking Water Date Collected: 05-Feb-18 15:39			Laboratory Data Lab Sample: 1800274-04 Date Received: 08-Feb-18 09:03				Column: BEH C18		
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS		ND	0.449	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFHxA		ND	0.672	2 5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFHpA		ND	0.540		10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFHxS		ND	0.420	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFOA		ND	1.09		10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFNA		ND	1.46		10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFOS		ND	1.05	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFDA		ND	1.30	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
MeFOSAA		ND	3.08	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
EtFOSAA		ND	1.96	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFUnA		ND	0.258	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFDoA		ND	0.965	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	Ī	
PFTrDA		ND	0.955	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
PFTeDA		ND	0.787	5.06	10.1		B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	I	
Labeled Stand	lards Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	94.2		70 - 130			B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
13C2-PFDA	SURR	89.1		70= 130			B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	
d5-EtFOSAA	SURR	96.7		70 - 130			B8B0104	16-Feb-18	0.247 L	23-Feb-18 17:38	1	

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



Sample ID:		EPA Method 537									
Client Data					Labo	ratory Data					
Name:	CH2M Hill	Matrix: Drinking Water		Lab S	Sample:	1800274-0)5	Column:	BEH C18		
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Coll	ected: 05-	Feb-18 16:11		Received:	08-Feb-18 09:03			DETTETO	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		41.8	0.450	5.08	10.2	-	B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFHxA		55.7	0.674	5.08	10.2	B	B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	i
PFHpA		19.9	0.542	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFHxS		108	0.422	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFOA		27.9	1.10	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFNA		ND	1.46	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	Î
PFOS		7.59	1.06	5.08	10.2	J	B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	I
PFDA		ND	1.30	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
MeFOSAA		ND	3.09	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
EtFOSAA		ND	1.96	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFUnA		ND	0.259	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFDoA		ND	0.968	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFTrDA		ND	0.959	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
PFTeDA		ND	0.790	5.08	10.2		B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
Labeled Standa	lards Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	109		70 - 130			B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
13C2-PFDA	SURR	86.7		70 - 130			B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1
d5-EtFOSAA	SURR	105		70 - 130			B8B0104	16-Feb-18	0.246 L	23-Feb-18 17:50	1

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



Sample ID: W	VI-A06-FB03-0218									EPA Metl	10d 537
Client Data					Lab	oratory Data					
Name:	CH2M Hill	Matrix:	Drii	nking Water	Lab	Sample:	1800274-0)6	Column:	BEH C18	
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Colle	Date Collected: 05-Feb-18 16:12		1			09:03	Column	DETICIO	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.435	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFHxA		4.92 0.739 W	0.652	4.92	9.83	-L-B	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	
PFHpA		ND	0.524	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFHxS		ND	0.408	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	î
PFOA		ND	1.06	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFNA		ND	1.42	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFOS		ND	1.02	4,92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	i
PFDA		ND	1.26	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	Î
MeFOSAA		ND	2.99	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
EtFOSAA		ND	1.90	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFUnA		ND	0.251	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFDoA		ND	0.935	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFTrDA		ND	0.927	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
PFTeDA		ND	0.764	4.92	9.83		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102		70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
13C2-PFDA	SURR	85.8		70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1
d5-EtFOSAA	SURR	94.8		70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:02	1

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



Sample ID: W	/I-A06-RW04-0218									EPA Metl	od 537	
Client Data					Lab	oratory Data						1
Name:	CH2M Hill	Matrix:	Dri	nking Water	Lab	Sample:	1800274-0) 7	Column:	BEH C18		1
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Co	llected: 05-	ected: 05-Feb-18 16:50		Date Received:		08-Feb-18 09:03		2211 010		
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	+
PFBS		37.9	0.436	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	î	1
PFHxA		4.92 3.80 L	0.653	4.92	9.85	J.B	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15		10
PFHpA		1.52	0.525	4.92	9.85	J	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15		1
PFHxS		50.6	0.409	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
PFOA		4.15	1.06	4.92	9.85	J	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
PFNA		ND	1.42	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	I	П
PFOS		2.77	1.02	4.92	9.85	J	B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
PFDA		ND	1.26	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
MeFOSAA		ND	3.00	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
EtFOSAA		ND	1.90	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
PFUnA		ND	0.251	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
PFDoA		ND	0.938	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
PFTrDA		ND	0.929	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
PFTeDA		ND	0.766	4.92	9.85		B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	Γ
13C2-PFHxA	SURR	93.0		70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	T
13C2-PFDA	SURR	77.5		70 = 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	1
d5-EtFOSAA	SURR	83.9		70 - 130			B8B0104	16-Feb-18	0.254 L	23-Feb-18 18:15	1	

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



Sample ID: W	VI-A06-FB04-0218									EPA Metl	hod 537
Client Data Name: CH2M Hill Project: CLEAN CTO-4041 WHIDBEY ISLAND		Matrix: Drinking Water Date Collected: 05-Feb-18 16:51			Lab S	Dratory Data	1800274-08		Column	ВЕН С18	
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Conected: 05-Feb-[8 [6:5]			Date	Received:	08-Feb-18 09:03				
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.447	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	ĩ
PFHxA		ND	0.668	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFHpA		ND	0.537	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	
PFHxS		ND	0.418	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFOA		ND	1.09	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFNA		ND	1.45	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFOS		ND	1.05	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFDA		ND	1.29	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
MeFOSAA		ND	3.06	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
EtFOSAA		ND	1.95	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFUnA		ND	0.257	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFDoA		ND	0.960	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	Ï
PFTrDA		ND	0.951	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
PFTeDA		ND	0.783	5.04	10.1		B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	85.1		70 - 130			B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
13C2-PFDA	SURR	78.1		70 - 130			B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1
d5-EtFOSAA	SURR	85.5		70 - 130			B8B0104	16-Feb-18	0.248 L	23-Feb-18 18:27	1

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



Sample ID: V	Sample ID: WI-A06-RW05-0218 EPA Method 537												
Client Data Name: CH2M Hill Project: CLEAN CTO-4041 WHIDBEY ISLAND		Matrix: Drinking Water Date Collected: 06-Feb-18 10:08			Lab S	oratory Data Sample: Received:	1800274-09 08-Feb-18 09:03		Column	BEH C18			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
PFBS		28.9	0.442	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFHxA		48.6	0.662	4.98	9.98	B	B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	ı		
PFHpA		20.2	0.532	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFHxS		210	0.828	9.96	20.0	Ø	B8B0104	16-Feb-18	0.251 L	26-Feb-18 11:08	2		
PFOA		57.7	1.08	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFNA		ND	1.44	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFOS		64.1	1.04	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFDA		ND	1.28	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	i		
MeFOSAA		ND	3.03	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	i		
EtFOSAA		ND	1.93	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	i		
PFUnA		ND	0.254	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFDoA		ND	0.950	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFTrDA		ND	0.941	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
PFTeDA		ND	0.775	4.98	9.98		B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution		
13C2-PFHxA	SURR	95.4		70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	T.		
13C2-PFDA	SURR	84.5		70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	Î		
d5-EtFOSAA	SURR	88.4		70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 19:17	1		

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



	od 537	EPA Meth										A06-FB05-0218	Sample ID: W
†						ratory Data	Labo						Client Data
		BEH C18	Column:	0	1800274-1	Sample:	Lab S	king Water	D	Matrix:		CH2M Hill	
		BERCOTO		09:03	08-Feb-18	Received:	Date				EY ISLAND	Project: CLEAN CTO-4041 WHIDBEY ISL	
+	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	nc. (ng/L)	Co		Analyte
7	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10,6	5.30	0.469	ND			PFBS
T۸	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104	113	10.6	5.30	0.702	0.716 U	5,30		PFHxA
1	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	0.564	ND			PFHpA
ı	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	0.439	ND			PFHxS
1	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	1.14	ND			PFOA
	12	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	1.52	ND			PFNA
	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	1.10	ND			PFOS
ı	Ï	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	1.36	ND			PFDA
	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	3.22	ND			MeFOSAA
	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	2.04	ND			EtFOSAA
1	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	0.270	ND			PFUnA
1	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	1.01	ND			PFDoA
1	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	0.999	ND			PFTrDA
	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104		10.6	5.30	0.823	ND			PFTeDA
Τ	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	pe	Тур	Labeled Standar
T	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104			70 - 130		91.8	URR	SU	13C2-PFHxA
	1	23-Feb-18 19:29		16-Feb-18	B8B0104			70 - 130		75.3	URR		13C2-PFDA
	1	23-Feb-18 19:29	0.236 L	16-Feb-18	B8B0104			70 - 130		89.8	URR		d5-EtFOSAA

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



Sample ID: WI-A06-RW06-0218												
Client Data Name: Project:	Name: CH2M Hill		Matrix: Drinking Water Date Collected: 06-Feb-18 10:56			Laboratory Data Lab Sample: 1800274-11 Date Received: 08-Feb-18 09:03				Column: BEH C18		
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS		ND	0.442	2 5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFHxA		ND	0,662	2 5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	Ī	
PFHpA		ND	0.532	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFHxS		ND	0.414	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFOA		ND	1.08	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFNA		ND	1.44	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	Ĩ	
PFOS		ND	1.04	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFDA		ND	1.28		9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	î	
MeFOSAA		ND	3.03		9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
EtFOSAA		ND	1.93		9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFUnA		ND	0.255	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFDoA		ND	0.950		9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFTrDA		ND	0.941	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
PFTeDA		ND	0.776	5.00	9.98		B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42		
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
13C2-PFHxA	SURR	94.2		70 - 130			B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	
13C2-PFDA	SURR	70.6		70 - 130			B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42		
d5-EtFOSAA	SURR	112		70 - 130			B8B0104	16-Feb-18	0.250 L	23-Feb-18 19:42	1	

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



Sample ID: '	WI-A06-RW05P-0218								EPA Meth	od 537	
Client Data					- 1	oratory Data	400000				
Name:	CH2M Hill	Matrix: Drinking Water Date Collected: 06-Feb-18 10:08			Sample:	1800274-1		Column:	BEH C18		
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Con-	ected: 06-F	eb-18 10:08	Date	Received:	08-Feb-18	09:03			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		28.9	0.444	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFHxA		49.8	0.665	5.02	10.0	B	B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFHpA		21.4	0.534	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFHxS		232	0.832	10.0	20.0	D	B8B0104	16-Feb-18	0.249 L	26-Feb-18 11:20	2
PFOA		55.3	1.08	5.02	10.0	1.	B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFNA		1.67	1.44	5.02	10.0	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	Ī
PFOS		63.8	1.04	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFDA		ND	1.28	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	Î
MeFOSAA		ND	3.05	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
EtFOSAA		ND	1.93	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFUnA		ND	0.256	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFDoA		ND	0.954	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFTrDA		ND	0.945	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
PFTeDA		ND	0.779	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	10
Labeled Standa	ards Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	97.3		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
13C2-PFDA	SURR	86.1		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1
d5-EtFOSAA	SURR	97.5		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 19:54	1

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



Sample ID: W	'I-A06-FB06-0218										EPA Metl	od 537	
Client Data					T i	Labor	ratory Data						t
Name:	CH2M Hill	M:	atrix:	Drinking Water	1	Lab Sa	ample:	1800274-1	13	Column	BEH C18		l
Project: CLEAN CTO-4041 WHIDBEY					1	Date Received: 08-Feb-18 0			09:03		2211010		
Analyte		Conc. (ng/	L) DI	L LOD	LO	Q	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	ł
PFBS		ND	0.4	14 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	Ī
PFHxA		5.02 0.770	TU 0.60	5.02	10.	.0	1,15	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	M
PFHpA		ND	0.53	34 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	ľ
PFHxS		ND	0.4	16 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	ı
PFOA		ND	1.0	8 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	ı
PFNA		ND	1.4	4 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	Î.	ı
PFOS		ND	1.0	4 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	1
PFDA		ND	1.2	8 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	Ú.	ı
MeFOSAA		ND	3.0	5 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	1
EtFOSAA		ND	1.9	4 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	- 1	1
PFUnA		ND	0.23	5.02	10.	0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	1
PFDoA		ND	0.93	5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	
PFTrDA		ND	0.94	16 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	1
PFTeDA		ND	0.7	79 5.02	10.	.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	
Labeled Standard	ds Type	% Reco	very	Limits			Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	Γ
13C2-PFHxA	SURR	104		70 - 130)			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	
13C2-PFDA	SURR	90.2		70 - 130)			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	
d5-EtFOSAA	SURR	106		70 - 130)			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:06	1	

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

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

ruslieli8

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Sample ID: V	VI-A06-RW07-0218									EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill CLEAN CTO-4041 WHIDBEY ISLAND	Matrix: Date Coll		Drinking Water 06-Feb-18 14:05	Lab :	oratory Data Sample: Received:	1800274-1 08-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.438	3 4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFHxA		ND	0.655	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFHpA		ND	0.527	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFHxS		ND	0.410	4,94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFOA		ND	1.07	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFNA		ND	1.42	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFOS		ND	1.03	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFDA		ND	1.26	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
MeFOSAA		ND	3.00	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
EtFOSAA		ND	1.91	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFUnA		ND	0.252	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFDoA		ND	0.941	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFTrDA		ND	0.932	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
PFTeDA		ND	0.768	4.94	9.88		B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	104		70 - 130			B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
13C2-PFDA	SURR	86.2		70 - 130			B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1
d5-EtFOSAA	SURR	91.0		70 - 130			B8B0104	16-Feb-18	0.253 L	23-Feb-18 20:19	1

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

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.

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7	od 537	EPA Metl										I-A06-FB07-0218	Sample ID: W
┪						ratory Data	Labo						Client Data
		BEH C18	Column:	5	1800274-1	Sample:	Lab S	ing Water	Drink	Matrix:		CH2M Hill	Name:
		DEN C.O		09:03	08-Feb-18	Received:	Date	b-18 14:05	cted: 06-Fe	Date Colle	IDBEY ISLAND	CLEAN CTO-4041 V	Project:
on	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	nc. (ng/L)	Cor		Analyte
ヿ	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	0.428	ND			PFBS
- [1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104	LB	9.67	4.84	0.641	0.677 W	4.84		PFHxA
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	0.516	ND			PFHpA
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	0.401	ND			PFHxS
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	1.04	ND			PFOA
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	1.39	ND			PFNA
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	1.01	ND			PFOS
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	1.24	ND			PFDA
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	2.94	ND			MeFOSAA
- 1	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	1.87	ND			EtFOSAA
	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	0.247	ND			PFUnA
	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	0.921	ND			PFDoA
	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	0.912	ND			PFTrDA
	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104		9.67	4.84	0.752	ND			PFTeDA
n	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Type %	is	Labeled Standar
	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104			70 - 130		95.8	SURR		13C2-PFHxA
	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104			70 - 130		82.9	SURR		13C2-PFDA
	1	23-Feb-18 20:31	0.258 L	16-Feb-18	B8B0104			70 - 130		111	SURR		d5-EtFOSAA

LOD - Limit of Detection LOQ - Limit of quantitation

on LCL-UCL- Lower control limit - upper control limit
ation Results reported to the DL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.



Sample ID: V	VI-A06-RW08-0218									EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill CLEAN CTO-4041 WHIDBEY ISLAND	Matrix: Date Coll		sing Water eb-18 18:02	Lab	oratory Data Sample: Received:	1800274-1 08-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		23.0	0.445	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFHxA		15.1	0.666	5.02	10.0	K	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFHpA		8.81	0.535	5.02	10.0	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFHxS		116	0.417	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFOA		25.4	1.08	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFNA		2.51	1.45	5.02	10.0	J	B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFOS		78.2	1.04	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	
PFDA		ND	1.29	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	Î
MeFOSAA		ND	3.05	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
EtFOSAA		ND	1.94	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFUnA		ND	0.256	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	- 1
PFDoA		ND	0.956	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFTrDA		ND	0.947	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
PFTeDA		ND	0.781	5.02	10.0		B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	92.4		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	1
13C2-PFDA	SURR	74.4		70 = 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	
d5-EtFOSAA	SURR	80.7		70 - 130			B8B0104	16-Feb-18	0.249 L	23-Feb-18 20:44	

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



Sample ID: V	WI-A06-FB08-0218									EPA Meth	10d 537
Client Data					Labo	ratory Data					
Name:	CH2M Hill	Matrix:	Drin	iking Water	Lab S	Sample:	1800274-1	17	Column	BEH C18	
Project:	CLEAN CTO-4041 WHIDBEY ISLAND	Date Coll	ected: 06-1	Feb-18 18:02	Date	Received:	08-Feb-18	09:03			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.441	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFHxA		ND	0.661	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFHpA		ND	0.531	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFHxS		ND	0.414	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFOA		ND	1.08	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFNA		ND	1.43	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	Ī
PFOS		ND	1.04	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFDA		ND	1.28	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
MeFOSAA		ND	3.03	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
EtFOSAA		ND	1.92	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFUnA		ND	0.254	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFDoA		ND	0.949	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFTrDA		ND	0.940	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
PFTeDA		ND	0.774	4.98	9.96		B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	96.4		70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
13C2-PFDA	SURR	80.8		70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1
d5-EtFOSAA	SURR	93.4		70 - 130			B8B0104	16-Feb-18	0.251 L	23-Feb-18 20:56	1

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

Only the linear isomer is reported for all other analytes.



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-75018-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
11	WI-A06-RW05-0218	580-75018-1	Water
2	WI-A06-RW05P-0218	580-75018-2	Water
3	WI-A06-RW06-0218	580-75018-3	Water
4	WI-A06-RW07-0218	580-75018-4	Water
5	WI-A06-RW08-0218	580-75018-5	Water

A full data validation was performed on the analytical data for five water samples collected on February 6, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References
SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC samples were not analyzed.

Surrogate Spike Recoveries

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

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

• MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

		SVOC		
Compound	WI-A06-RW05-0218 ug/L	WI-A06-RW05P-0218 ug/L	RPD	Qualifier
1,4-Dioxane	0.053	0.055	4%	None

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Date Sampled: 02/06/2018 1008

TAC051

Client: CH2M Hill, Inc. Job Number: 580-75018-1

Client Sample ID: W1-A06-RW05-0218

Lab Sample ID: 580-75018-1

Client Matrix: Water Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Analysis Batch:

580-267316 Instrument ID: 3520C Prep Batch: 580-267129 Lab File ID:

Prep Method: 0214B016.D Dilution: 1.0 Initial Weight/Volume: 1023.4 mL Analysis Date: 02/14/2018 2021 Final Weight/Volume: 2 mL

Prep Date: 02/12/2018 1053 Injection Volume: 2 uL

Analyte Result (ug/L) Qualifier DL LOQ 1,4-Dioxane 0.053 JM 0.011 0.098

Surrogate %Rec Qualifier Acceptance Limits

2-Fluorophenol 85 53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-75018-1

Client Sample ID:

W1-A06-RW05P-0218

Lab Sample ID:

580-75018-2

02/12/2018 1053

Client Matrix: Water Date Sampled: 02/06/2018 1008 Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM

Analysis Batch:

580-267316

Instrument ID:

TAC051

Prep Method: Dilution:

3520C

Prep Batch:

580-267129

Lab File ID:

0214B017.D

1.0

Analysis Date:

Initial Weight/Volume: 1025.7 mL

Prep Date:

02/14/2018 2046

Final Weight/Volume: Injection Volume:

2 mL

Analyte 1,4-Dioxane

Result (ug/L) 0.055

Qualifier JM

DL 0.011 LOQ 0.097

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

75

Client: CH2M Hill, Inc. Job Number: 580-75018-1

Client Sample ID: W1-A06-RW06-0218

Date Sampled: 02/06/2018 1056

Lab Sample ID: 580-75018-3

Client Matrix: Water Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Analysis Batch: 580-267316 Prep Batch: 580-267129 Instrument ID: Lab File ID:

TAC051 0214B018.D

02/15/2018

Dilution: 1.0 Analysis Date:

02/14/2018 2110 02/12/2018 1053 Initial Weight/Volume: 1000.6 mL Final Weight/Volume: 2 mL

DL

Injection Volume:

Analyte

Prep Date:

Result (ug/L)

Qualifier U

LOQ 0.011 0.10

1,4-Dioxane Surrogate

0.030 %Rec

Acceptance Limits

2-Fluorophenol

80

Qualifier

Client: CH2M Hill, Inc. Job Number: 580-75018-1

W1-A06-RW07-0218 Client Sample ID:

1.0

Date Sampled: 02/06/2018 1405 Date Received: 02/09/2018 0925

Lab Sample ID: Client Matrix:

580-75018-4

02/14/2018 2135

Water

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C Dilution:

Analysis Batch: Prep Batch:

580-267316 580-267129

Instrument ID: **TAC051** Lab File ID: 0214B019.D

Initial Weight/Volume: 1020.2 mL Final Weight/Volume: 2 mL Injection Volume: 2 uL

Prep Date: 02/12/2018 1053 Analyte

Result (ug/L)

Qualifier

DL 0.011 LOQ 0.098

1,4-Dioxane Surrogate

Analysis Date:

0.029 %Rec

Qualifier

Acceptance Limits

2-Fluorophenol

81

U

Client: CH2M Hill, Inc. Job Number: 580-75018-1

Client Sample ID: W1-A06-RW08-0218

Lab Sample ID:

580-75018-5

Client Matrix: Water Date Sampled: 02/06/2018 1802 Date Received: 02/09/2018 0925

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM 3520C

Analysis Batch:

580-267316

Instrument ID: Lab File ID:

TAC051

Prep Method: Dilution: Analysis Date:

1.0 02/14/2018 2159 Prep Batch:

580-267129

Initial Weight/Volume:

0214B020.D 989.4 mL

Final Weight/Volume: Injection Volume:

2 mL 2 uL

Analyte

Prep Date:

Result (ug/L) 0.26

Qualifier

DL 0.011 LOQ 0.10

1,4-Dioxane Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

02/12/2018 1053

88



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-75081-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW09-0218	580-75081-1	Water
1MS	WI-A06-RW09-0218MS	580-75081-1MS	Water
1MSD	WI-A06-RW09-0218MSD	580-75081-1MSD	Water
1RE†	WI-A06-RW09-0218RE	580-75081-1RE	Water
1REMS†	WI-A06-RW09-0218MSRE	580-75081-1MSRE	Water
1REMSD†	WI-A06-RW09-0218MSDRE	580-75081-1MSDRE	Water
2*	WI-A06-TB02-0218	580-75081-2	Water
3	WI-A06-RW10-0218	580-75081-3	Water
4	WI-A06-RW11-0218	580-75081-4	Water
5	WI-A06-RW12-0218	580-75081-5	Water

A full data validation was performed on the analytical data for four water samples and one aqueous trip blank sample collected on February 7-12, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB02-0218	None - ND	164	-	=

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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	Affected Samples
1	Vinyl Chloride	OK/OK/47	None	For RPD Alone

Laboratory Control Samples

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.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days except for EDS Sample 1RE. This sample was re-extracted outside of holding times and qualified as estimated (UJ).

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC samples were not analyzed.

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	Affected Samples
1	1,4-Dioxane	0%/0%/NC	UJ	1

<u>Laboratory Control Samples</u>

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

EDS Sample 1 was analyzed for MS/MSD although the laboratory inadvertently did not spike the sample. The sample was re-extracted outside of holding times and reanalyzed. The original analysis result should be used for reporting purposes.

Field Duplicate Sample Precision

Field duplicate samples were not analyzed.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 5/15/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Job Number: 580-75081-1 Client: CH2M Hill, Inc.

Client Sample ID: W1-A06-RW09-0218

Lab Sample ID: 580-75081-1

Client Matrix: Water Date Sampled: 02/07/2018 1326 Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: Prep Date: 02/16/2018 1300

02/16/2018 1300

Analysis Batch: Prep Batch: N/A

580-267464

Instrument ID: Lab File ID:

TAC036 021618_08.D

Initial Weight/Volume: 5 mL

Final Weight/Volume:

Analyte Vinyl chloride Result (ug/L) 0.040

Qualifier UJ

DL 0.013 LOQ 0.50

Surrogate Trifluorotoluene (Surr) Dibromofluoromethane (Surr) %Rec 97 96

Qualifier M

Acceptance Limits 80 - 141

TAC036

021618_11.D

LOQ

0.50

Client: CH2M Hill, Inc. Job Number: 580-75081-1

Client Sample ID: W1-A06-TB02-0218

Lab Sample ID: 580-75081-2 Date Sampled: 02/07/2018 0800 Client Matrix: Water Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

N/A

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analyte

Vinyl chloride

Analysis Date: 02/16/2018 1411

Prep Date: 02/16/2018 1411

580-267464

Instrument ID:

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

DL

0.013

Lab File ID:

Qualifier

0.040 UM Surrogate %Rec Qualifier Acceptance Limits

Result (ug/L)

Analysis Batch:

Prep Batch:

Trifluorotoluene (Surr) 98 80 - 141 Dibromofluoromethane (Surr) 96 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID:

W1-A06-RW10-0218

Lab Sample ID:

580-75081-3

Client Matrix: Water

Date Sampled: 02/12/2018 1009 Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-267464

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

Lab File ID:

021618_12.D

Dilution:

1.0

N/A

Analysis Date:

Initial Weight/Volume: 5 mL

Prep Date:

Vinyl chloride

02/16/2018 1434

Final Weight/Volume: 5 mL

Analyte

02/16/2018 1434

Result (ug/L) 0.040

Qualifier

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

98 97

%Rec

Qualifier

Acceptance Limits

M

U

80 - 141 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75081-1

Client Sample ID: W1-A06-RW11-0218

> Date Sampled: 02/12/2018 1309 Date Received: 02/14/2018 0955

Lab Sample ID: Client Matrix:

580-75081-4 Water

8260C SIM Volatile Organic Compounds (GC/MS)

8260C SIM Analysis Batch: 5030B Prep Batch:

580-267464 Instrument ID: TAC036

Prep Method: Dilution:

Analysis Method:

1.0

N/A

Lab File ID:

021618_13.D

Initial Weight/Volume:

5 mL

Analysis Date: Prep Date:

02/16/2018 1458

Final Weight/Volume:

Analyte Vinyl chloride 02/16/2018 1458

Result (ug/L) 0.040

Qualifier U

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr) %Rec 97

96

Qualifier

M

Acceptance Limits 80 - 141 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID:

W1-A06-RW12-0218

Lab Sample ID:

580-75081-5

Client Matrix:

Water

Date Sampled: 02/12/2018 1453 Date Received: 02/14/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method:

Analysis Batch: 5030B Prep Batch:

580-267464 N/A

Instrument ID: Lab File ID:

TAC036

021618_14.D

Dilution:

1.0

02/16/2018 1521

Analysis Date: Prep Date:

02/16/2018 1521

Initial Weight/Volume: 5 mL

Final Weight/Volume:

Analyte Vinyl chloride

Result (ug/L) 0.040

Qualifier U

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

%Rec 95 96

Qualifier

Acceptance Limits 80 - 141

77 - 118

TestAmerica Seattle

Page 37 of 793 MNS114/18

Client: CH2M Hill, Inc. Job Number: 580-75081-1

Client Sample ID: W1-A06-RW09-0218

Lab Sample ID: 580-75081-1 Date Sampled: 02/07/2018 1326 Client Matrix: Water Date Received: 02/14/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method:

Dilution:

3520C

1.0

Analysis Date: Prep Date: 02/14/2018 1241

02/15/2018 1651

Analysis Batch: 580-267403 Prep Batch:

580-267314

Instrument ID: Lab File ID:

TAC051 0215B006.D Initial Weight/Volume: 1039,6 mL

MSL

Final Weight/Volume: 2 mL Injection Volume: 2 uL

Analyte Result (ug/L) Qualifier DL LOQ J-M-0.011

1,4-Dioxane 0.029 VJ

Qualifier

0.096

Surrogate %Rec Acceptance Limits 2-Fluorophenol 83 ø 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75081-1

Client Sample ID:

W1-A06-RW09-0218

Lab Sample ID:

580-75081-1

Client Matrix:

Water

HT

Date Sampled: 02/07/2018 1326 Date Received: 02/14/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-267778

Instrument ID:

Prep Method:

3520C

Lab File ID:

Dilution:

Prep Batch:

580-267607

Initial Weight/Volume:

022128a011.D 071) 1025.6 mL

Analysis Date:

1.0

Final Weight/Volume:

Prep Date:

02/21/2018 1940

02/19/2018 1416

Run Type:

RE

Injection Volume:

2.0 mL 1 uL

Analyte 1,4-Dioxane Result (ug/L) 0.029 LJ

Qualifier DH.

DL 0.011 LOQ

0.098

Surrogate 2-Fluorophenol %Rec 81

Qualifier

Acceptance Limits

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID:

W1-A06-RW10-0218

Lab Sample ID:

580-75081-3

Client Matrix:

Water

Date Sampled: 02/12/2018 1009

Date Received: 02/14/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM

Analysis Batch:

580-267403

Instrument ID:

TAC051

Prep Method: Dilution:

3520C 1.0

Prep Batch:

Lab File ID:

0215B009.D

Result (ug/L)

580-267314

Analysis Date:

Initial Weight/Volume: 1010.7 mL

Prep Date:

02/15/2018 1805

02/14/2018 1241

Final Weight/Volume: 2 mL Injection Volume:

2 uL

Analyte 1,4-Dioxane

Qualifier

DL 0.011 LOQ 0.099

Surrogate

%Rec

0.030

Qualifier

Acceptance Limits

2-Fluorophenol

85

Ø

Client: CH2M Hill, Inc. Job Number: 580-75081-1

Client Sample ID: W1-A06-RW11-0218

> Date Sampled: 02/12/2018 1309 Date Received: 02/14/2018 0955

Lab Sample ID: Client Matrix:

Water

580-75081-4

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Analysis Batch: 580-267403 Prep Method: 3520C Prep Batch:

Instrument ID: 580-267314 Lab File ID:

TAC051 0215B010.D

Dilution: 1.0

02/15/2018 1829

Initial Weight/Volume: 1023 mL Final Weight/Volume: 2 mL

Analysis Date: Prep Date:

02/14/2018 1241

Injection Volume: 2 uL

Analyte 1,4-Dioxane

Result (ug/L) 0.029

Qualifier

DL 0.011 LOQ 0.098

Surrogate

%Rec 75

Qualifier Ø

Acceptance Limits

2-Fluorophenol

Client: CH2M Hill, Inc.

Job Number: 580-75081-1

Client Sample ID:

W1-A06-RW12-0218

Lab Sample ID:

580-75081-5

Client Matrix:

Water

Date Sampled: 02/12/2018 1453 Date Received: 02/14/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-267403

Instrument ID:

TAC051

Prep Method: Dilution:

3520C

Prep Batch:

580-267314

Lab File ID:

0215B011.D

1.0

Initial Weight/Volume: 1044.3 mL

Analysis Date:

02/15/2018 1854

Final Weight/Volume: Injection Volume:

2 mL

Prep Date:

02/14/2018 1241

Result (ug/L)

Qualifier

DL 0.011 LOQ 0.096

1,4-Dioxane Surrogate

Analyte

0.029 %Rec

Qualifier

Acceptance Limits

2-Fluorophenol

84

Q



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800307

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

PFCs					
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix		
1	WI-A06-RW09-0218	1800307-01	Water		
1MS	WI-A06-RW09-0218MS	1800307-01MS	Water		
1MSD	WI-A06-RW09-0218MSD	1800307-01MSD	Water		
2	WI-A06-FB09-0218	1800307-02	Water		
3	WI-A06-RW10-0218	1800307-03	Water		
4	WI-A06-FB10-0218	1800307-04	Water		
5	WI-A06-RW11-0218	1800307-05	Water		
6	WI-A06-FB11-0218	1800307-06 Water			
7	WI-A06-RW12-0218	1800307-07	Water		
8	WI-A06-FB12-0218	1800307-08	Water		

A full data validation was performed on the analytical data for four water samples and four aqueous field blanks sample collected on February 7-12, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- · 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

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.

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ng/L		_
WI-A06-FB09-0218	None - ND	100	3	==
WI-A06-FB10-0218	PFHxA	0.687	None	All Associated ND
WI-A06-FB11-0218	PFHxA	0.814	U	7
WI-A06-FB12-0218	None - ND	<u>(€</u>).		B

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

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

Laboratory Control Samples

• 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.

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 (757) 564-0090 if you have any questions or need further information.

Signed:

Senior Chemist

Mancy Weaver Dated: 5/15/18

Data Qualifier	Definition	
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.	
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.	
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.	
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.	
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.	



Sample ID: W	T-A06-RW09-0218									EPA Meth	nod 537
Client Data					Labo	ratory Data					
Name:	CH2M Hill	Matrix:	Drinl	ing Water	Lab S	Sample:	1800307-0)]	Column	BEH C18	
Project:	CTO-4041 CLEAN WHIDBEY ISLAND	Date Coll	ected 07-F	eb-18 13:26	Date	Received:	14-Feb-18	10:10		527.010	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.393	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFHxA		0.829	0.588	4.43	8.87	J	B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFHpA		ND	0.473	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFHxS		ND	0.368	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFOA		ND	0.958	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFNA		ND	1.28	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFOS		ND	0.922	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFDA		ND	1.13	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
MeFOSAA		ND	2.70	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
EtFOSAA		ND	1.71	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFUnA		ND	0.226	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFDoA		ND	0.844	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFTrDA		ND	0.836	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
PFTeDA		ND	0.689	4.43	8.87		B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	120		70 - 130			B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
I3C2-PFDA	SURR	110		70 - 130			B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1
d5-EtFOSAA	SURR	117		70 - 130			B8B0105	16-Feb-18	0.282 L	24-Feb-18 19:42	1

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



Sample ID: W	/I-A06-FB09-0218									EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill CTO-4041 CLEAN WHIDBEY ISLAND	Matrix: Date Colle		Orinking Water 07-Feb-18 13:27	Lab S	Sample: Received:	1800307-(14-Feb-18	_	Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.413	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFHxA		ND	0.618	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFHpA		ND	0.496	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFHxS		ND	0.387	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFOA		ND	1.01	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFNA		ND	1.34	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFOS		ND	0.969	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFDA		ND	1.19	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	-1
MeFOSAA		ND	2.83	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
EtFOSAA		ND	1.80	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFUnA		ND	0.238	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFDoA		ND	0.887	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFTrDA		ND	0.878	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
PFTeDA		ND	0.724	4.66	9.32		B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	4
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102		70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1
13C2-PFDA	SURR	89.3		70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	
d5-EtFOSAA	SURR	104		70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 19:54	1

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

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Sample ID: W	I-A06-RW10-0218									EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill CTO-4041 CLEAN WHIDBEY ISLAND	Matrix: Date Coll	ected:	Drinking Water 12-Feb-18 10:09	Lab	oratory Data Sample: Received:	1800307-0 14-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.40	3 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFHxA		ND	0.60	3 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFHpA		ND	0.48	5 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFHxS		ND	0.37	8 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFOA		ND	0.98	3 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFNA		ND	1.3	4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFOS		ND	0.94	7 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFDA		ND	1.16	5 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
MeFOSAA		ND	2.77	7 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1.
EtFOSAA		ND	1.7€	5 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	
PFUnA		ND	0.23	2 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFDoA		ND	0.86	6 4.55	9.10		B8B0105	16-Feb-18	0,275 L	24-Feb-18 20:07	1
PFTrDA		ND	0.85	8 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
PFTeDA		ND	0.70	7 4.55	9.10		B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
Labeled Standard	ls Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	88.1		70 - 130			B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
13C2-PFDA	SURR	72.1		70 - 130			B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1
d5-EtFOSAA	SURR	89.9		70 - 130			B8B0105	16-Feb-18	0.275 L	24-Feb-18 20:07	1

LOD - Limit of Detection LOQ - Limit of quantitation LC1.-UCL- Lower control limit - upper control limit Results reported to the DL. When reported, PFHxS, PFOA and PFOS include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

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Sample ID: W	/I-A06-FB10-0218									EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill CTO-4041 CLEAN WHIDBEY ISLAND	Matrix: Date Colle		Drinking Water 12-Feb-18 10:10	Lab :	Sample: Received:	1800307-0 14-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.410	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	I
PFHxA		0.687	0.613	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFHpA		ND	0.493	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFHxS		ND	0.384	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFOA		ND	0.999	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFNA		ND	1.33	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	L
PFOS		ND	0.962	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFDA		ND	1.18	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
MeFOSAA		ND	2.81	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
EtFOSAA		ND	1.78	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFUnA		ND	0.236	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFDoA		ND	0.880	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFTrDA		ND	0.872	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
PFTeDA		ND	0.718	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	101		70 - 130			B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
13C2-PFDA	SURR	85.3		70 - 130			B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1
d5-EtFOSAA	SURR	106		70 - 130			B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:19	1

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

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Sample ID: W	VI-A06-RW11-0218									EPA Meth	10d 537
Client Data	G1101 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					oratory Data					
Name:	CH2M Hill	Matrix:		nking Water	- 1	Sample:	1800307-0		Column	BEH C18	
Project:	CTO-4041 CLEAN WHIDBEY ISLAND	Date Coll	ected: 12-	Feb-18 13:09	Date	Received:	14-Feb-18	10:10			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.402	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFHxA		ND	0.602	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFHpA		ND	0.484	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFHxS		ND	0.377	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFOA		ND	0.980	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFNA		ND	1.31	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	E
PFOS		ND	0.944	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFDA		ND	1.16	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
MeFOSAA		ND	2,76	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
EtFOSAA		ND	1.75	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFUnA		ND	0.231	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFDoA		ND	0.864	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFTrDA		ND	0.856	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
PFTeDA		ND	0.705	4.53	9.07		B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	96.3		70 - 130			B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
13C2-PFDA	SURR	78.5		70 - 130			B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1
d5-EtFOSAA	SURR	97.2		70 - 130			B8B0105	16-Feb-18	0.276 L	24-Feb-18 20:31	1

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



Sample ID: W	/I-A06-FB11-0218									EPA Meth	ıod 537
Client Data Name: Project:	CH2M Hill CTO-4041 CLEAN WHIDBEY ISLAND	Matrix: Date Coll		rinking Water 2-Feb-18 13:10	Lab S	oratory Data Sample: Received:	1800307-0 14-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.429	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFHxA		0.814	0.641	4.84	9.67	J	B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	Ï
PFHpA		ND	0.516	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFHxS		ND	0.401	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFOA		ND	1.04	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFNA		ND	1.39	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFOS		ND	1.01	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFDA		ND	1.24	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
MeFOSAA		ND	2.94	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
EtFOSAA		ND	1.87	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFUnA		ND	0.247	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFDoA		ND	0.921	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	Î.
PFTrDA		ND	0.912	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
PFTeDA		ND	0.752	4.84	9.67		B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
Labeled Standard	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	105		70 - 130			B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
13C2-PFDA	SURR	92.1		70 - 130			B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1
d5-EtFOSAA	SURR	109		70 - 130			B8B0105	16-Feb-18	0.258 L	24-Feb-18 20:44	1

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



Sample ID: W	/I-A06-RW12-0218									EPA Met	hod 537
Client Data Name: Project:	CH2M Hill CTO-4041 CLEAN WHIDBEY ISLAND	Matrix: Date Coll		ing Water b-18 14:53	Lab	Sample: Received:	1800307-0 14-Feb-18		Column	ВЕН С18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualiflers	Batch	Extracted	Samp Size	Analyzed	Dilution
FBS		2.27	0.410	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1
FHxA		4.63 2.76 U	0.613	4.63	9.25	1	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1
FHpA		ND	0.493	4.63	9.25	755	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1
FHxS		1.51	0.384	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	I
FOA		1.03	0.999	4.63	9.25	J	B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1
FNA		ND	1.33	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
FOS		ND	0.962	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1
FDA		ND	1.18	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
1eFOSAA		ND	2.81	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
tFOSAA		ND	1.79	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
FUnA		ND	0.236	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
FDoA		ND	0.881	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	70
FTrDA		ND	0.872	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
FTeDA		ND	0.719	4.63	9.25		B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
abeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
3C2-PFHxA	SURR	102		70 - 130			B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	1
3C2-PFDA	SURR	83.9		70 - 130			B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	
5-EtFOSAA	SURR	99.0		70 - 130			B8B0105	16-Feb-18	0.270 L	24-Feb-18 20:56	

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



Sample ID: V	WI-A06-FB12-0218									EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill CTO-4041 CLEAN WHIDBEY ISLAND	Matrix: Date Coll		Drinking Water 12-Feb-18 14:54	Lab :	Sample: Received:	1800307-0 14-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.41	4 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFHxA		ND	0.61	9 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	- 3
PFHpA		ND	0.49	8 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	100
PFHxS		ND	0.38	8 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	i
PFOA		ND	1.01		9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFNA		ND	1.35	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFOS		ND	0.97	1 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	i
PFDA		ND	1.20	4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	Ŷ
MeFOSAA		ND	2.84		9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	î
EtFOSAA		ND	1,80		9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	î
PFUnA		ND	0.238	8 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFDoA		ND	0.889	9 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1
PFTrDA		ND	0.88		9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	i
PFTeDA		ND	0.720	6 4.66	9.34		B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	î
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	96.7		70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	A
13C2-PFDA	SURR	89.4		70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	i
d5-EtFOSAA	SURR	92.8		70 - 130			B8B0105	16-Feb-18	0.268 L	24-Feb-18 21:09	1

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-75176-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW13-0218	580-75176-1	Water
2	WI-A06-RW14-0218	580-75176-2	Water
3	WI-A06-RW15-0218	580-75176-3	Water
4	WI-A06-RW16-0218	580-75176-4	Water
5*	WI-A06-TB03-0218	580-75176-5	Water

^{* -} VOC only

A full data validation was performed on the analytical data for four water samples and one aqueous trip blank sample collected on February 13-14, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

<u>Analysis</u> <u>Method References</u>

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB03-0218	None - ND		= =	= ===============================

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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

• The MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC samples were not analyzed.

Surrogate Spike Recoveries

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

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

The MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 analyzed.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: Sli5/18

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Client: CH2M Hill, Inc. Job Number: 580-75176-1

Client Sample ID:

W1-A06-RW13-0218

Lab Sample ID: Client Matrix:

580-75176-1

Water

Date Sampled: 02/13/2018 1551

Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:

8260C SIM

5030B

Prep Method: Dilution:

Analysis Date: Prep Date:

1.0

02/20/2018 1215

Analysis Batch: Prep Batch:

N/A

580-267637

Instrument ID: Lab File ID:

TAC036 022018_08.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Acceptance Limits

Analyte Vinyl chloride 02/20/2018 1215

Result (ug/L) 0.040

Qualifier

Qualifier

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

%Rec 97 97

M

80 - 141 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75176-1

Client Sample ID: W1-A06-RW14-0218

Lab Sample ID: 580-75176-2

Client Matrix: Water

Date Sampled: 02/14/2018 0925

Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM 5030B

Prep Method: Dilution:

1.0

Analysis Date: Prep Date:

02/20/2018 1238

02/20/2018 1238

Analysis Batch:

Prep Batch:

580-267637

N/A

Instrument ID:

TAC036

Lab File ID: Initial Weight/Volume: 5 mL

022018_09.D

Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 UΜ 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 97 80 - 141 M Dibromofluoromethane (Surr) 98 77 - 118

> Page 30 of 606 nw 5/14/18

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID:

W1-A06-RW15-0218

Lab Sample ID: Client Matrix:

580-75176-3

Water

Date Sampled: 02/14/2018 1003 Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: Prep Method:

8260C SIM

5030B

Dilution:

1.0

Analysis Date: Prep Date:

02/20/2018 1302

02/20/2018 1302

Analysis Batch: Prep Batch:

580-267637

N/A

Instrument ID:

TAC036

Lab File ID: Initial Weight/Volume 022018_10.D

5 mL Final Weight/Volume: 5 mL

Analyte Vinyl chloride

Result (ug/L) 0.040

Qualifier

UM

DL 0.013 LOQ 0.50

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr) %Rec 97

98

Qualifier

Acceptance Limits 80 - 141

77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75176-1

Client Sample ID: W1-A06-RW16-0218

> Date Sampled: 02/14/2018 1104 Date Received: 02/16/2018 0935

> > TAC036

Lab Sample ID: Client Matrix:

580-75176-4 Water

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Analysis Batch: 580-267637 Instrument ID: Prep Method: 5030B Prep Batch: N/A

Lab File ID: 022018_11.D Initial Weight/Volume: 5 mL

Dilution: 1.0 Analysis Date: 02/20/2018 1325 Final Weight/Volume: 5 mL Prep Date: 02/20/2018 1325

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 U 0.50

Surrogate %Rec Qualifier **Acceptance Limits** Trifluorotoluene (Surr) 95 80 - 141 M Dibromofluoromethane (Surr) 99 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID:

W1-A06-TB03-0218

Lab Sample ID: Client Matrix:

580-75176-5

Water

Date Sampled: 02/13/2018 0800 Date Received: 02/16/2018 0935

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-267637

Instrument ID:

TAC036

Prep Method:

5030B

Lab File ID:

Dilution:

1.0

Prep Batch:

N/A

022018_12.D

Initial Weight/Volume: 5 mL

Analysis Date:

02/20/2018 1349

Final Weight/Volume: 5 mL

Prep Date:

02/20/2018 1349

DL

LOQ

Analyte Vinyl chloride Result (ug/L) 0.040

Qualifier U

0.013

0.50

Surrogate

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

%Rec 98 98

Qualifier M

80 - 141 77 - 118

Acceptance Limits

TAC050

022128a014.D

Client: CH2M Hill, Inc. Job Number: 580-75176-1

Client Sample ID: W1-A06-RW13-0218

 Lab Sample ID:
 580-75176-1
 Date Sampled: 02/13/2018 1551

 Client Matrix:
 Water
 Date Received: 02/16/2018 0935

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

02/00 Olin Senitvolatile Organic Compounds (GC/MS Sim)

Analysis Method: 8270D SIM Analysis Batch: 580-267778 Instrument ID: Prep Method: 3520C Prep Batch: 580-267607 Lab File ID:

 Dilution:
 1.0
 Initial Weight/Volume:
 1053.3 mL

 Analysis Date:
 02/21/2018 2047
 Final Weight/Volume:
 2.0 mL

 Prep Date:
 02/19/2018 1416
 Injection Volume:
 1 uL

 Analyte
 Result (ug/L)
 Qualifier
 DL
 LOQ

 1,4-Dioxane
 0.028
 U
 0.010
 0.095

Surrogate %Rec Qualifier Acceptance Limits
2-Fluorophenol 84 53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID:

W1-A06-RW14-0218

Lab Sample ID:

580-75176-2

Client Matrix:

Water

Date Sampled: 02/14/2018 0925 Date Received: 02/16/2018 0935

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM 3520C

Analysis Batch:

580-267778

Instrument ID:

TAC050

Prep Method: Dilution:

1.0

Prep Batch: 580-267607

Lab File ID:

022128a015.D

Analysis Date: Prep Date:

02/21/2018 2109

Initial Weight/Volume: 1047.9 mL Final Weight/Volume:

02/19/2018 1416

Injection Volume:

2.0 mL

Analyte 1,4-Dioxane

Result (ug/L) 0.029

Qualifier U

DL 0.010 LOQ 0.095

Surrogate

2-Fluorophenol

%Rec

Qualifier

Acceptance Limits

83

53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75176-1

Client Sample ID: W1-A06-RW15-0218

580-75176-3

Lab Sample ID: 580-75176-3 Client Matrix: Water Date Sampled: 02/14/2018 1003 Date Received: 02/16/2018 0935

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

 Analysis Method:
 8270D SIM
 Analysis Batch:
 580-267778
 Instrument ID:
 TAC050

 Prep Method:
 3520C
 Prep Batch:
 580-267607
 Lab File ID:
 022128a016.D

 Dilution:
 1.0
 Initial Weight/Volume:
 1042.2 mL

 Analysis Date:
 02/21/2018 2131
 Final Weight/Volume:
 2.0 mL

 Prep Date:
 02/19/2018 1416
 Injection Volume:
 1 uL

 Analyte
 Result (ug/L)
 Qualifier
 DL
 LOQ

 1,4-Dioxane
 0.029
 U
 0.011
 0.096

Surrogate %Rec Qualifier Acceptance Limits

2-Fluorophenol 87 53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-75176-1

Client Sample ID:

W1-A06-RW16-0218

Lab Sample ID:

02/19/2018 1416

Client Matrix:

580-75176-4

Water

Date Sampled: 02/14/2018 1104 Date Received: 02/16/2018 0935

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: Prep Method:

8270D SIM 3520C

Analysis Batch:

580-267778

Instrument ID: Lab File ID:

TAC050

Dilution:

1.0

Prep Batch:

580-267607

022128a017.D

Analysis Date: Prep Date:

02/21/2018 2153

Initial Weight/Volume: 1047 mL Final Weight/Volume: 2.0 mL

Injection Volume:

1 uL

Analyte 1,4-Dioxane Result (ug/L) 0.029

Qualifier

DL 0.011 LOQ 0.096

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

85

53 - 106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800322

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW13-0218	1800322-01	Water
2	WI-A06-FB13-0218	1800322-02	Water
3	WI-A06-RW14-0218	1800322-03	Water
4	WI-A06-FB14-0218	1800322-04	Water
5	WI-A06-RW15-0218	1800322-05	Water
6	WI-A06-FB15-0218	1800322-06	Water
7	WI-A06-RW16-0218	1800322-07	Water
8	WI-A06-FB16-0218	1800322-08	Water

A full data validation was performed on the analytical data for four water samples and four aqueous field blanks sample collected on February 13-14, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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.

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB13-0218	None - ND	(E)	(m):	<u>.</u>
WI-A06-FB14-0218	PFHxA	0.665	None	All Associated >10X
WI-A06-FB15-0218	None - ND	199	(4)	<u> </u>
WI-A06-FB16-0218	None - ND	(#)	¥5	8

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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.

Target Compound Identification

• All mass spectra and quantitation criteria were met.

Compound Quantitation

EDS Sample 3 was analyzed at a 5X dilution due to high concentrations of target compounds. The reporting limits were adjusted accordingly. No action was required.

Field Duplicate Sample Precision

Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Senior Chemist

Mancy Weaver Dated: 5/15/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID:	WI-A06-RW13-0218									EPA Meth	nod 537
Client Data					Labo	ratory Data					
Name:	CH2M Hill	Matrix:	Drin	king Water	Lab S	Sample:	1800322-0	01	Column	BEH C18	
Project:	CTO-4041 Clean Whidbey Island	Date Coll	ected: 13-F	eb-18 15:51	Date	Received:	16-Feb-18	09:02		DETTO	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.437	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFHxA		0,676	0.654	4.94	9.87	J	B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	i
PFHpA		ND	0.526	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFHxS		ND	0.410	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFOA		ND	1.07	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFNA		ND	1.42	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFOS		ND	1.03	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFDA		ND	1.26	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
MeFOSAA		ND	3.00	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
EtFOSAA		ND	1.90	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFUnA		ND	0.252	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFDoA		ND	0.940	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFTrDA		ND	0.931	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
PFTeDA		ND	0.767	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
Labeled Stand	ards Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	108		70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
13C2-PFDA	SURR	83.0		70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1
d5-EtFOSAA	SURR	79.1		70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 21:58	1

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

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.

Only the linear isomer is reported for all other analytes.



Sample ID: V	VI-A06-FB13-0218									EPA Meti	hod 537
Client Data Name:	CH2M Hill	Matrix: Date Coll		king Water	Lab S	Dratory Data	1800322-0		Column	: BEH C18	
Project:	CTO-4041 Clean Whidbey Island	Date Con	ected: 13-F	20-18 15:52	Date	Received:	16-Feb-18	09:02			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.437	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFHxA		ND	0.654	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFHpA		ND	0.526	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFHxS		ND	0.410	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFOA		ND	1.07	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFNA		ND	1.42	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFOS		ND	1.03	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFDA		ND	1.26	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
MeFOSAA		ND	3.00	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
EtFOSAA		ND	1.90	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFUnA		ND	0.252	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFDoA		ND	0.940	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFTrDA		ND	0.931	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
PFTeDA		ND	0.767	4.94	9.87		B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	91.2		70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	ï
13C2-PFDA	SURR	81.5		70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1
d5-EtFOSAA	SURR	102		70 - 130			B8B0124	20-Feb-18	0.253 L	24-Feb-18 22:10	1

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



Sample ID: V	VI-A06-RW14-0218									EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill CTO-4041 Clean Whidbey Island	Matrix: Date Coll		ing Water eb-18 09:25	Lab S	Fratory Data Sample: Received:	1800322-0 16-Feb-18		Column	: BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		58.0	0.453	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFHxA		60.5	0.679	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	Ĩ
PFHpA		16.3	0.546	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFHxS		260	2.12	25.6	51.2	D	B8B0124	20-Feb-18	0.244 L	28-Feb-18 11:33	5
PFOA		21.8	1.11	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFNA		ND	1.47	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFOS		7.68	1.06	5.12	10.2	J	B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFDA		ND	1.31	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	î
MeFOSAA		ND	3.11	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
EtFOSAA		ND	1.98	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFUnA		ND	0.261	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFDoA		ND	0.974	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFTrDA		ND	0.965	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
PFTeDA		ND	0.795	5.12	10.2		B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	89.4		70 - 130			B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1
13C2-PFDA	SURR	71.9		70 - 130			B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	Ï
d5-EtFOSAA	SURR	88.9		70 - 130			B8B0124	20-Feb-18	0.244 L	26-Feb-18 08:28	1

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



Sample ID: V	VI-A06-FB14-0218									EPA Metl	hod 537
Client Data Name: Project:	CH2M Hill CTO-4041 Clean Whidbey Island	Matrix: Date Coll		nking Water Feb-18 09:26	Lab S	oratory Data Sample: Received:	1800322-0 16-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualiflers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.428	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFHxA		0.665	0.641	4.83	9.67	J	B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFHpA		ND	0.515	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFHxS		ND	0.401	4.83	9.67		B8B0124	20-Feb-18	0.259 L	01-Mar-18 16:48	1
PFOA		ND	1.04	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFNA		ND	1.39	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFOS		ND	1.01	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFDA		ND	1.24	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	î
MeFOSAA		ND	2.94	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
EtFOSAA		ND	1.87	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	- 1
PFUnA		ND	0.247	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFDoA		ND	0.920	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFTrDA		ND	0.912	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
PFTeDA		ND	0.751	4.83	9.67		B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.2		70 - 130			B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1
13C2-PFDA	SURR	76.6		70 - 130			B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	Ì
d5-EtFOSAA	SURR	79.6		70 - 130			B8B0124	20-Feb-18	0.259 L	24-Feb-18 22:35	1

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



Sample ID: V	VI-A06-RW15-0218									EPA Metl	hod 537
Client Data Name: Project:	CH2M Hill CTO-4041 Clean Whidbey Island	Matrix: Date Coll		Prinking Water 4-Feb-18 10:03	Lab S	oratory Data Sample: Received:	1800322-0 16-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.435	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFHxA		ND	0.650	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFHpA		ND	0.523	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFHxS		ND	0.407	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFOA		ND	1.06	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFNA		ND	1.41	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFOS		ND	1.02	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFDA		ND	1.26	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
MeFOSAA		ND	2.98	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
EtFOSAA		ND	1.89	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFUnA		ND	0.250	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	- 1
PFDoA		ND	0.934	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	
PFTrDA		ND	0.925	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
PFTeDA		ND	0.762	4.90	9.81		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.0		70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
13C2-PFDA	SURR	90.0		70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1
d5-EtFOSAA	SURR	85.0		70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:39	1

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

Only the linear isomer is reported for all other analytes.



Sample ID: V	VI-A06-FB15-0218									EPA Metl	hod 537
Client Data Name: Project;	CH2M Hill CTO-4041 Clean Whidbey Island	Matrix: Date Coll		Orinking Water 4-Feb-18 10:04	Lab :	oratory Data Sample: Received:	1800322-0 16-Feb-18		Column	: ВЕН С18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.435	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFHxA		ND	0.651	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFHpA		ND	0.523	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFHxS		ND	0.407	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	A
PFOA		ND	1.06	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFNA		ND	1.41	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFOS		ND	1.02	4,90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFDA		ND	1.26	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
MeFOSAA		ND	2.98	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
EtFOSAA		ND	1.89	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFUnA		ND	0.250	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFDoA		ND	0.934	4.90	9.82		B8B0153	27-Feb-18	0,255 L	28-Feb-18 10:51	1
PFTrDA		ND	0,926	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
PFTeDA		ND	0.763	4.90	9.82		B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.4		70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
13C2-PFDA	SURR	89.7		70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1
d5-EtFOSAA	SURR	103		70 - 130			B8B0153	27-Feb-18	0.255 L	28-Feb-18 10:51	1

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



Sample ID: W	'I-A06-RW16-0218									EPA Meth	nod 537
Client Data Name: Project:	CH2M Hill CTO-4041 Clean Whidbey Island	Matrix: Date Coll		king Water eb-18 11:04	Lab S	Fratory Data Sample: Received:	1800322-0 16-Feb-18		Column	BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.446	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFHxA		0,906	0.668	5.04	10.1	J	B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFHpA		ND	0.537	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFHxS		ND	0.418	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFOA		ND	1.09	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFNA		ND	1.45	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFOS		ND	1.05	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFDA		ND	1.29	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
MeFOSAA		ND	3.06	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
EtFOSAA		ND	1.94	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFUnA		ND	0.257	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	i
PFDoA		ND	0.958	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFTrDA		ND	0.949	5.04	10,1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
PFTeDA		ND	0.782	5.04	10.1		B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
Labeled Standard	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95.7		70 - 130			B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
13C2-PFDA	SURR	81.7		70 - 130			B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1
d5-EtFOSAA	SURR	84.9		70 - 130			B8B0124	20-Feb-18	0.248 L	24-Feb-18 23:12	1

LOD - Limit of Detection LOQ - Limit of quantitation 1.CL-UCL- Lower control limit - upper control limit Results reported to the DL.



Sample ID: V	VI-A06-FB16-0218									EPA Meth	nod 537
Client Data Name:	CH2M Hill CTO 4041 Chap Whidhay Island	Matrix: Date Col		king Water	Lab S	oratory Data Sample:	1800322-(Column	BEH C18	
Project:	CTO-4041 Clean Whidbey Island	Date Col	iecteu. 14-F	eb-18 11:05	Date	Received:	16-Feb-18	09:02			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.431	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFHxA		ND	0.644	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFHpA		ND	0.518	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFHxS		ND	0.403	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	9
PFOA		ND	1.05	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFNA		ND	1.40	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFOS		ND	1.01	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFDA		ND	1.24	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
MeFOSAA		ND	2.96	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
EtFOSAA		ND	1.88	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFUnA		ND	0.248	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFDoA		ND	0.925	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFTrDA		ND	0.917	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
PFTeDA		ND	0.755	4.86	9.72		B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	106		70 - 130			B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
13C2-PFDA	SURR	85.9		70 - 130			B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1
d5-EtFOSAA	SURR	86.2		70 - 130			B8B0124	20-Feb-18	0.257 L	24-Feb-18 23:25	1

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-75281-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 14, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1*	WI-A06-TB01-021918	580-75281-1	Water
2	WI-A06-EB01-021918	580-75281-2	Water
3	WI-A06-MW-13-0218	580-75281-3	Water
3MS†	WI-A06-MW-13-0218MS	580-75281-3MS	Water
3MSD†	WI-A06-MW-13-0218MSD	580-75281-3MSD	Water
4	WI-A06-RW17-0218	580-75281-4	Water
5	WI-A06-RW17P-0218	580-75281-5	Water
6	WI-A06-DW-38A-0218	580-75281-6	Water
7	WI-A06-6-S-27-0218	580-75281-7	Water
8	WI-A06-6-S-28-0218	580-75281-8	Water
9	WI-A06-FB01-022218	580-75281-9	Water
10	WI-A06-MW-01-0218	580-75281-10	Water
11	WI-A06-EB01-0218	580-75281-11	Water

* - VOC only † - SVOC only

A full data validation was performed on the analytical data for seven water samples, two aqueous equipment blank samples, one aqueous field blank sample, and one aqueous trip blank sample collected on February 19-21, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

• All criteria were met.

Initial Calibration

 The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ug/L		
WI-A06-TB01-021918	None - ND	-	+	
WI-A06-EB01-021918	None - ND		æ	(e)
WI-A06-FB01-022118	None - ND	(m)	= =	14
WI-A06-EB01-0218	None - ND	143	2	

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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

• The MS/MSD samples were not analyzed.

Laboratory Control Samples

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 results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
Vinyl Chloride	ND	ND		2

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-021918	None - ND	SH2	97	8
WI-A06-FB01-022118	None - ND	165	=:	8
WI-A06-EB01-0218	None - ND		(4)	

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 ID	Compound	MS %R/MSD %R/ RPD	Qualifier	Affected Samples
3	1,4-Dioxane	OK/OK/33	None	For RPD Alone

Laboratory Control Samples

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 results are summarized below.

Compound	WI-A06-RW17-0218 ug/L	WI-A06-RW17P-0218 ug/L	RPD	Qualifier
1,4-Dioxane	ND	ND	H	=

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 5/15/18 Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-TB01-021918

Lab Sample ID:

580-75281-1

Client Matrix:

Water

Date Sampled: 02/19/2018 0700 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-268193

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

Lab File ID:

Dilution:

N/A

030118_08.D

1.0

Initial Weight/Volume: 5 mL

Analysis Date:

Final Weight/Volume: 5 mL

Prep Date:

03/01/2018 1533 03/01/2018 1533

Analyte Vinyl chloride Result (ug/L) 0.040

Qualifier U

DL 0.013 LOQ 0.50

Surrogate

%Rec 96

Qualifier

80 - 141

Acceptance Limits

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

100

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-021918

580-75281-2

Lab Sample ID: Client Matrix: Water

Date Sampled: 02/19/2018 1645 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method:

5030B

Dilution: 1.0

Analysis Date: Prep Date:

03/01/2018 1556

03/01/2018 1556

Analysis Batch: Prep Batch:

580-268193

N/A

Instrument ID: Lab File ID:

TAC036 030118_09.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier **Acceptance Limits** Trifluorotoluene (Surr) 98 80 - 141 M Dibromofluoromethane (Surr) 99 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-13-0218

Lab Sample ID: 580-75281-3

Client Matrix: Water Date Sampled: 02/20/2018 1110 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-268193

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

Lab File ID:

Dilution:

1.0

N/A

030118_10.D

Analysis Date:

03/01/2018 1620

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Prep Date: Analyte

03/01/2018 1620

Result (ug/L) 0.040

Qualifier

DL 0.013 LOQ 0.50

Vinyl chloride Surrogate

%Rec

Qualifier

Acceptance Limits

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

98 100

M

80 - 141 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-RW17-0218

Lab Sample ID:

580-75281-4

Client Matrix:

Water

Date Sampled: 02/20/2018 1340 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Analysis Batch:

580-268193

Instrument ID:

TAC036

Prep Method:

5030B

Dilution:

1.0

Prep Batch:

N/A

Lab File ID:

030118_11.D

Analysis Date:

03/01/2018 1644

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Prep Date:

03/01/2018 1644

Qualifier

DL

LOQ

Analyte Vinyl chloride Result (ug/L) 0.040

0.013

0.50

Surrogate

Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

%Rec 97 100

Qualifier M

Acceptance Limits 80 - 141

TAC036

030118_12.D

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17P-0218

 Lab Sample ID:
 580-75281-5
 Date Sampled: 02/20/2018 1345

 Client Matrix:
 Water
 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Analysis Batch: 580-268193 Instrument ID: Prep Method: 5030B Prep Batch: N/A Lab File ID:

Dilution: 1.0 Initial Weight/Volume: 5 mL

Analysis Date: 03/01/2018 1708 Final Weight/Volume: 5 mL

Prep Date: 03/01/2018 1708

 Analyte
 Result (ug/L)
 Qualifier
 DL
 LOQ

 Vinyl chloride
 0.040
 U
 0.013
 0.50

Surrogate %Rec Qualifier Acceptance Limits
Trifluorotoluene (Surr) 97 80 - 141
Dibromofluoromethane (Surr) 100 M 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218 6

Lab Sample ID:

580-75281-6

Client Matrix:

Water

Date Sampled: 02/20/2018 1455 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

1.0

Dilution: Analysis Date:

03/01/2018 1731 Prep Date: 03/01/2018 1731 Analysis Batch:

N/A

580-268193

Instrument ID: Lab File ID:

TAC036 030118_13.D

Initial Weight/Volume: 5 mL Final Weight/Volume:

Analyte Result (ug/L) Qualifier DL LOQ 0.013 Vinyl chloride 0.040 U 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 98 80 - 141 Dibromofluoromethane (Surr) 101 M 77 - 118

Prep Batch:

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-6-S-27-0218

Lab Sample ID: 580-75281-7

Client Matrix:

Water

Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Prep Method: 5030B Dilution: 1.0

Surrogate

Analysis Date: 03/01/2018 1755

Prep Date: 03/01/2018 1755 Analysis Batch: 580-268193

Prep Batch: N/A

Qualifier

Instrument ID: Lab File ID:

TAC036 030118_14.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Acceptance Limits Trifluorotoluene (Surr) 97 80 - 141 Dibromofluoromethane (Surr) 100 M 77 - 118

%Rec

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06--6-S-28-0218

5030B

Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

Lab Sample ID: Client Matrix:

Prep Method:

Analysis Method: 8260C SIM

580-75281-8 Water

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Batch: 580-268193 Instrument ID: TAC036 Prep Batch: N/A Lab File ID: 030118_15.D

Dilution: 1.0 Initial Weight/Volume: 5 mL Analysis Date: 03/01/2018 1818

Final Weight/Volume: 5 mL Prep Date: 03/01/2018 1818

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 98 80 - 141 Dibromofluoromethane (Surr) 98 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-FB01-022118

Lab Sample ID: 580-75281-9

Client Matrix: Water

Date Sampled: 02/21/2018 1500 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

Prep Method: 5030B

Dilution: 1.0

Analysis Date: Prep Date:

03/01/2018 1842

03/01/2018 1842

Analysis Batch:

Prep Batch:

580-268193

N/A

Instrument ID:

TAC036

Lab File ID: 030118_16.D Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 96 80 - 141 M Dibromofluoromethane (Surr) 99 77 - 118

TAC036

5 mL

030118_17.D

10

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

Lab Sample ID: 580-75281-10 Date Sampled: 02/21/2018 1510 Client Matrix: Water Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

N/A

580-268193

Instrument ID:

Initial Weight/Volume:

Final Weight/Volume: 5 mL

Lab File ID:

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: 03/01/2018 1906

Prep Date: 03/01/2018 1906

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Analysis Batch:

Prep Batch:

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 99 80 - 141 Dibromofluoromethane (Surr) 99 M 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-EB01-0218

Lab Sample ID: 580-75281-11

Client Matrix: Water Date Sampled: 02/21/2018 1650 Date Received: 02/23/2018 0955

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: 03/01/2018 1929

Prep Date: 03/01/2018 1929 Analysis Batch: Prep Batch:

580-268193

N/A

Instrument ID: Lab File ID:

TAC036 030118_18.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 0.013 0.50

Surrogate %Rec Qualifier **Acceptance Limits** Trifluorotoluene (Surr) 98 80 - 141 M Dibromofluoromethane (Surr) 101 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-EB01-021918

Lab Sample ID:

580-75281-2

Client Matrix: Water Date Sampled: 02/19/2018 1645 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method:

3520C

Lab File ID:

022728a006.D

Dilution:

1.0

Prep Batch:

580-267977

Initial Weight/Volume: 979 mL

Analysis Date:

02/27/2018 1650 02/26/2018 1348

Final Weight/Volume: Injection Volume:

2 mL

Analyte 1,4-Dioxane

Prep Date:

Result (ug/L) 0.031

Qualifier

U

DL 0.011 LOQ 0.10

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

90

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-MW-13-0218

Lab Sample ID:

Client Matrix: Water

580-75281-3

Date Sampled: 02/20/2018 1110

Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method:

3520C

Lab File ID:

Prep Batch:

Dilution:

580-267977

022728a007.D

1.0

Initial Weight/Volume: 977.2 mL

Analysis Date: Prep Date:

02/27/2018 1712

Final Weight/Volume: Injection Volume:

2 mL

Analyte

02/26/2018 1348

Result (ug/L) 0.031

Qualifier

DL 0.011 LOQ 0.10

1,4-Dioxane Surrogate

%Rec

Qualifier

U

Acceptance Limits

2-Fluorophenoi

70

Client: CH2M Hill, Inc. Job Number: 580-75281-1

WI-A06-RW17-0218 **Client Sample ID:**

Lab Sample ID: 580-75281-4

Client Matrix: Water Date Sampled: 02/20/2018 1340 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date:

Prep Date:

02/26/2018 1348

02/27/2018 1819

Analysis Batch: Prep Batch:

580-268070 580-267977 Instrument ID: Lab File ID:

TAC050 022728a010.D

Initial Weight/Volume: 1003.5 mL Final Weight/Volume: 2 mL Injection Volume:

Analyte Result (ug/L) Qualifier LOQ DL 1,4-Dioxane 0.030 U 0.011 0.10

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 92 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-RW17P-0218

Lab Sample ID: 580-75281-5 Date Sampled: 02/20/2018 1345 Client Matrix: Water Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date: Prep Date: 02/26/2018 1348

02/27/2018 1841

Analysis Batch: 580-268070 Prep Batch:

580-267977

Instrument ID: Lab File ID:

TAC050 022728a011.D Initial Weight/Volume: 969.4 mL

Final Weight/Volume: 2 mL Injection Volume: 1 uL

Analyte Result (ug/L) Qualifier DL LOQ 1,4-Dioxane 0.031 0.011 0.10

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 100 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-DW-38A-0218

Lab Sample ID:

580-75281-6

Client Matrix: Water Date Sampled: 02/20/2018 1455 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM 3520C Prep Method: Dilution:

1.0

Analysis Date: Prep Date:

02/27/2018 1903 02/26/2018 1348 Analysis Batch: 580-268070 Prep Batch:

580-267977

Instrument ID:

TAC050 Lab File ID: 022728a012.D Initial Weight/Volume: 994.9 mL

Final Weight/Volume: 2 mL Injection Volume: 1 uL

Analyte Result (ug/L) LOQ Qualifier DL 1,4-Dioxane 1.7 0.011 0.10

Surrogate %Rec Qualifier **Acceptance Limits** 2-Fluorophenol 96 53 - 106

Client: CH2M Hill, Inc. Job Number: 580-75281-1

WI-A06-6-S-27-0218 Client Sample ID:

Lab Sample ID: 580-75281-7

Client Matrix: Water Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date:

Prep Date:

02/26/2018 1348

02/27/2018 1925

Analysis Batch: Prep Batch:

580-268070

580-267977

Instrument ID: Lab File ID:

TAC050 022728a013.D

Initial Weight/Volume: 1032.1 mL Final Weight/Volume: 2 mL Injection Volume:

Analyte 1,4-Dioxane Result (ug/L)

Qualifier U

DL 0.011 LOQ 0.097

Surrogate 2-Fluorophenol %Rec

Qualifier

Acceptance Limits

91

0.029

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06--6-S-28-0218

Lab Sample ID

580-75281-8

Client Matrix:

Water

Date Sampled: 02/21/2018 1115 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method: Dilution:

3520C 1.0

Prep Batch:

580-267977

Lab File ID:

022728a014.D

Analysis Date: Prep Date:

02/27/2018 1947

Initial Weight/Volume: 1035.9 mL

Final Weight/Volume: Injection Volume:

2 mL 1 uL

Analyte

Surrogate

02/26/2018 1348

Qualifier

DL 0.011 LOQ 0.097

1,4-Dioxane

0.029

Result (ug/L)

U

Acceptance Limits

2-Fluorophenol

%Rec 78

Qualifier

53 - 106

TestAmerica Seattle

Page 48 of 685 nus stufle8

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-FB01-022118

Lab Sample ID:

580-75281-9

Client Matrix: Water

Date Sampled: 02/21/2018 1500 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM

Analysis Batch:

580-268070

Instrument ID:

TAC050

Prep Method:

3520C

Prep Batch:

580-267977

Lab File ID:

Dilution:

1.0

Initial Weight/Volume:

022728a015.D 989.4 mL

Analysis Date: Prep Date:

02/27/2018 2009

Final Weight/Volume:

2 mL

1 uL

02/26/2018 1348

Injection Volume:

DL

LOQ

Analyte 1,4-Dioxane Result (ug/L) 0.030

Qualifier U

0.011

0.10

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

98

Client: CH2M Hill, Inc. Job Number: 580-75281-1

Client Sample ID: WI-A06-MW-01-0218

Lab Sample ID: 580-75281-10

Date Sampled: 02/21/2018 1510 Client Matrix: Water Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method: 3520C

Dilution: 1.0

Analysis Date: 02/27/2018 2031 Prep Date:

02/26/2018 1348

Analysis Batch: Prep Batch:

580-268070 580-267977

Instrument ID: Lab File ID:

TAC050 022728a016.D

Initial Weight/Volume: 1054.7 mL Final Weight/Volume: 2 mL Injection Volume: 1 uL

Analyte Result (ug/L) Qualifier DL LOQ 1,4-Dioxane 0.028 U 0.010 0.095

Surrogate %Rec Qualifier Acceptance Limits 2-Fluorophenol 98 53 - 106

Client: CH2M Hill, Inc.

Job Number: 580-75281-1

Client Sample ID:

WI-A06-EB01-0218

Lab Sample ID:

580-75281-11

Client Matrix:

Water

Date Sampled: 02/21/2018 1650 Date Received: 02/23/2018 0955

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: 8270D SIM Prep Method:

3520C

Analysis Batch:

580-268070

Instrument ID:

TAC050

Dilution:

1.0

Prep Batch:

Lab File ID:

022728a017.D

Analysis Date: Prep Date:

580-267977

Initial Weight/Volume: 992.8 mL

02/27/2018 2053

Final Weight/Volume:

2 mL

02/26/2018 1348

Injection Volume:

1 uL

Analyte 1,4-Dioxane Result (ug/L) 0.030

Qualifier

DL 0.011 LOQ 0.10

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

88



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800362

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 12, 2018

	PFCs									
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix							
1	WI-A06-RW17-0218	1800362-01	Water							
2	WI-A06-RW17P-0218	1800362-02	Water							
3	WI-A06-FB02-022018	1800362-03	Water							

A full data validation was performed on the analytical data for two water samples and one aqueous field blank sample collected on February 20, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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.

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB02-022018	PFHxA	0.689	None	All ND

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

		PFCs			
Compound	WI-A06-RW17-0218 ng/L	WI-A06-RW17P-0218 ng/L	RPD	Qualifier	
None	ND	ND	×		

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Many Weaver Dated: 5/15/18 Nancy Weaver

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: \	WI-A06-RW17-0218										EPA Meth	10d 537
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6 AREA 6		Matrix: Date Coll		ting Water eb-18 13:40	Lab S	oratory Data Sample: Received:	1800362-(23-Feb-18		Column	BEH C18	
Analyte			Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS			ND	0.398	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFHxA			ND	0.596	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFHpA			ND	0.479	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFHxS			ND	0.373	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFOA			ND	0.971	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFNA			ND	1.29	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFOS			ND	0.935	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFDA			ND	1.15	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
MeFOSAA			ND	2.73	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Маг-18 15:55	1
EtFOSAA			ND	1.74	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFUnA			ND	0.229	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFDoA			ND	0.856	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFTrDA			- ND	0.848	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
PFTeDA			ND	0.699	4.50	8.99		B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
Labeled Standa	rds	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA		SURR	96.9		70 - 130			B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
13C2-PFDA		SURR	84.3		70 - 130			B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1
d5-EtFOSAA		SURR	101		70 - 130			B8B0160	01-Mar-18	0.278 L	02-Mar-18 15:55	1

DL - Detection Limit

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



Sample ID: WI-A06-RW17P-0218 EPA Method 537												
Client Data Name: Project: Location:	CH2M Hill NASWI Area 6 AREA 6		Matrix: Drinking Water Date Collected: 20-Feb-18 13:45			Laboratory Data Lab Sample: Date Received:		1800362-02 23-Feb-18 09:35		Column	: BEH C18	
Analyte			Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS			ND	0.400	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFHxA			ND	0.598	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFHpA			ND	0.481	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFHxS			ND	0.374	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFOA			ND	0.974	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFNA			ND	1.30	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	ì
PFOS			ND	0.938	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFDA			ND	1.15	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
MeFOSAA			ND	2.74	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
EtFOSAA			ND	1.74	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFUnA			ND	0.230	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFDoA			ND	0.859	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	Î
PFTrDA			ND	0.851	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
PFTeDA			ND	0.701	4.51	9.02		B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
Labeled Standar	rds	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA		SURR	88.1		70 - 130			B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	1
13C2-PFDA		SURR	77.3		70 - 130			B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	(5)
d5-EtFOSAA		SURR	99.7		70 - 130			B8B0160	01-Mar-18	0.277 L	02-Mar-18 16:08	Î

DL - Detection Limit

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



Sample ID: WI-A06-FB02-022018 EPA Method 537												
Client Data Name: CH2M Hill Project: NASWI Area 6 Location: AREA 6		Matrix: Date Col	Matrix: Drinking Water Date Collected: 20-Feb-18 13:50			Laboratory Data Lab Sample: Date Received:		1800362-03 23-Feb-18 09:35		: ВЕН С18	18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution	
PFBS		ND	0.415	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFHxA		0.689	0.621	4.68	9.37	J	B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFHpA		ND	0.500	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFHxS		ND	0.389	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	11	
PFOA		ND	1.01	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFNA		ND	1.35	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFOS		ND	0.975	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFDA		ND	1.20	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
MeFOSAA		ND	2.85	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
EtFOSAA		ND	1.81	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFUnA		ND	0.239	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFDoA		ND	0.892	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFTrDA		ND	0.884	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
PFTeDA		ND ND	0.728	4.68	9.37		B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution	
13C2-PFHxA	SURF	93.1		70 - 130			B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
13C2-PFDA	SURF	86.2		70 - 130			B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	
d5-EtFOSAA	SURF			70 - 130			B8B0160	01-Mar-18	0.267 L	02-Mar-18 16:20	1	

DL - Detection Limit

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

Work Order 1800362 Page 10 of 15



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-76760-1

Laboratory: Test America Laboratories, Tacoma, Washington

Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: June 4, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW18-0418	580-76760-1	Water
2	WI-A06-RW18P-0418	580-76760-2	Water
3	WI-A06-RW20-0418	580-76760-3	Water
4*	WI-A06-TB01-042018	580-76760-4	Water

^{* -} VOC only

A full data validation was performed on the analytical data for three water samples and one aqueous trip blank sample collected on April 20, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride)USEPA SW-846 Method 8260C SIMSVOC (1,4-Dioxane)USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-042018	None - ND	A-2	- E	=======================================

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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

• MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below.

Compound	WI-A06-RW18-0418 ug/L	WI-A06-RW18P-0418 ug/L	RPD	Qualifier
Vinyl Chloride	0.014	0.040U	NC	None

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC samples were not analyzed.

Surrogate Spike Recoveries

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

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

Compound	WI-A06-RW18-0418 ug/L	WI-A06-RW18P-0418 ug/L	RPD	Qualifier
1,4-Dioxane	0.10	0.11	10%	None

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 6/5/8

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

Client Sample ID:

WI-A06-RW18-0418

Lab Sample ID:

580-76760-1

Client Matrix:

Water

Date Sampled: 04/20/2018 1027

Date Received: 04/21/2018 0930

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:

8260C SIM

Analysis Batch:

580-272188

Instrument ID:

TAC036

Prep Method:

5030B

Prep Batch:

Lab File ID:

Dilution:

1.0

N/A

042518_08.D

Analysis Date:

Initial Weight/Volume: 5 mL

Prep Date:

04/25/2018 1105 04/25/2018 1105

Final Weight/Volume: 5 mL

Analyte Vinyl chloride

Result (ug/L) 0.014

Qualifier

DL 0.013 LOQ 0.50

Surrogate

%Rec 100

97

Qualifier

Acceptance Limits 80 - 141

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

M

J

TAC036

5 mL

042518_09.D

2

Client: CH2M Hill, Inc. Job Number: 580-76760-1

Client Sample ID: WI-A06-RW18P-0418

Lab Sample ID: 580-76760-2

Date Sampled: 04/20/2018 1030 Client Matrix: Water Date Received: 04/21/2018 0930

N/A

580-272188

Instrument ID:

Initial Weight/Volume:

Final Weight/Volume: 5 mL

Lab File ID:

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method: 5030B

Dilution: 1.0

Analysis Date: Prep Date:

04/25/2018 1129

04/25/2018 1129

Analysis Batch:

Prep Batch:

Result (ug/L) Analyte Qualifier DL LOQ Vinyl chloride 0.040 UM 0.013 0.50

Surrogate %Rec Qualifier Acceptance Limits Trifluorotoluene (Surr) 101 80 - 141 Dibromofluoromethane (Surr) 99 77 - 118 M

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

Client Sample ID:

WI-A06-RW20-0418

Lab Sample ID: Client Matrix:

580-76760-3

Water

Date Sampled: 04/20/2018 1010 Date Received: 04/21/2018 0930

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method:

8260C SIM 5030B

Analysis Batch:

580-272188

Instrument ID:

TAC036

Prep Method: Dilution:

1.0

Prep Batch:

%Rec

101

97

N/A

Lab File ID:

042518_10.D

Analysis Date:

04/25/2018 1152

Initial Weight/Volume: 5 mL

DL

Prep Date:

Final Weight/Volume: 5 mL

Analyte Vinyl chloride 04/25/2018 1152

Result (ug/L) 0.040

Qualifier UM

Qualifier

M

LOQ 0.013 0.50

Acceptance Limits

Surrogate

Trifluorotoluene (Surr) Dibromofluoromethane (Surr)

80 - 141 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

Date Sampled: 04/20/2018 1000

Date Received: 04/21/2018 0930

Client Sample ID:

WI-A06-TB01-042018

Lab Sample ID:

580-76760-4

Client Matrix:

Water

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: Prep Method:

Prep Date:

8260C SIM

5030B 1.0

Dilution: Analysis Date:

04/25/2018 1215 04/25/2018 1215 Analysis Batch: Prep Batch:

N/A

580-272188

Instrument ID: Lab File ID:

TAC036 042518_11.D

Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.040 UM 0.013 0.50 Surrogate %Rec Qualifier Acceptance Limits

Trifluorotoluene (Surr) 101 80 - 141 Dibromofluoromethane (Surr) M 99 77 - 118

Client: CH2M Hill, Inc. Job Number: 580-76760-1

Client Sample ID: WI-A06-RW18-0418

Lab Sample ID:

580-76760-1

Client Matrix:

Water

Date Sampled: 04/20/2018 1027 Date Received: 04/21/2018 0930

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: Prep Method:

8270D SIM 3520C

1.0

Dilution: Analysis Date: Prep Date:

04/27/2018 0032 04/24/2018 1408 Analysis Batch: Prep Batch:

580-272379 580-272131

Instrument ID: Lab File ID:

TAC050 042618a024.D

Initial Weight/Volume: 1016.3 mL Final Weight/Volume: 2 mL Injection Volume:

Analyte 1,4-Dioxane

Result (ug/L) 0.10

Qualifier M

DL 0.011 LOQ 0.098

Surrogate 2-Fluorophenol

%Rec 77

Qualifier

Acceptance Limits

Client: CH2M Hill, Inc.

Job Number: 580-76760-1

Client Sample ID:

WI-A06-RW18P-0418

Lab Sample ID:

580-76760-2

Client Matrix:

Water

Date Sampled: 04/20/2018 1030 Date Received: 04/21/2018 0930

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM

Analysis Batch:

580-272379

Instrument ID:

TAC050

Prep Method:

3520C

580-272131

Dilution:

1.0

Prep Batch:

Lab File ID:

Initial Weight/Volume: 997.8 mL

042618a025.D

Analysis Date:

04/27/2018 0054

Final Weight/Volume:

2 mL

Prep Date:

04/24/2018 1408

Injection Volume:

Analyte 1,4-Dioxane Result (ug/L) 0.11

Qualifier

DL 0.011 LOQ 0.10

Surrogate

%Rec

Qualifier

Acceptance Limits

2-Fluorophenol

81

Client: CH2M Hill, Inc. Job Number: 580-76760-1

Client Sample ID: WI-A06-RW20-0418

Lab Sample ID: 580-76760-3

Client Matrix: Water

Date Sampled: 04/20/2018 1010 Date Received: 04/21/2018 0930

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method: Prep Method:

8270D SIM 3520C

Analysis Batch:

580-272379

Instrument ID:

TAC050

Dilution:

1.0

Prep Batch:

580-272131

Lab File ID: Initial Weight/Volume: 1034.1 mL

042618a026.D

Analysis Date:

04/27/2018 0117 04/24/2018 1408 Final Weight/Volume: Injection Volume:

2 mL 1 uL

Analyte 1,4-Dioxane

Prep Date:

Qualifier

DL 0.011 LOQ 0.097

Surrogate

%Rec

Result (ug/L)

Qualifier

Acceptance Limits

2-Fluorophenol

74

0.11

M



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1800728

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: June 4, 2018

PFCs									
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix						
1	WI-A06-RW18-0418	1800728-01	Water						
2	WI-A06-RW18P-0418	1800728-02	Water						
3	WI-A06-FB18-0418	1800728-03	Water						
4	WI-A06-RW20-0418	1800728-04	Water						
5	WI-A06-FB20-0418	1800728-05	Water						

A full data validation was performed on the analytical data for three water samples and two aqueous field blank samples collected on April 20, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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
PFCs USEPA Method 537 Rev 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

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.

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc.	Qualifier	Affected Samples
		ng/L		
WI-A06-FB18-0418	None - ND		=	
WI-A06-FB20-0418	None - ND	¥		

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

• MS/MSD samples were not analyzed.

Laboratory Control Samples

• 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 ID	Compound	%R	Qualifier	Affected Samples
1	d5-EtFOSAA	68.7%	UJ	Associated Compounds

Target Compound Identification

• All mass spectra and quantitation criteria were met.

Compound Quantitation

• All criteria were met.

Field Duplicate Sample Precision

• Field duplicate results are summarized below. The precision was acceptable.

		PFCs		
Compound	mpound $WI-A06-RW18-0418$ $WI-A06-RW18$ mg/L mg/L		RPD	Qualifie
PFBS	22.6	20.5	10%	None
PFHxA	26.1	29.3	12%	
PFHpA	9.21	11.3	20%	
PFHxS	135	125	8%	
PFOA	29.1	30.6	5%	
PFNA	ND	1.59	NC	
PFOS	44.7	43.0	4%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 6/5/18

Nancy Weaver Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: WI-A06-RW18-0418 EPA Method 537											
	: BEH C18	Column:	Lab Sample: 1800728-01 Date Received: 21-Apr-18 09:38			Lab S	Matrix: Drinking Water I		1 Hill 4041 695610.06.FI.FS	Client Data Name: Project: Location:	
ilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)		Analyte
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	0.428	22.6		PFBS
1	03-May-18 00:55	0.259 L	27-Арг-18	B8D0148		9.67	4.83	0.842	26.1		PFHxA
1	03-May-18 00:55	0.259 L	27-Арг-18	B8D0148	J	9.67	4.83	0.515	9.21		PFHpA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	0.401	135		PFHxS
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	1.04	29.1		PFOA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	1.39	ND		PFNA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	1.01	44.7		PFOS
i	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	1.24	ND		PFDA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	2.94	ND		MeFOSAA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	1.87	DHD UJ		EtFOSAA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	0.247	ND		PFUnA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	0.921	ND		PFDoA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	0.912	ND		PFTrDA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148		9.67	4.83	0.751	ND		PFTeDA
ilution	Analyzed I	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Туре	Labeled Standaı
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148			70 - 130		87.9	SURR	13C2-PFHxA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148			70 - 130		86.8	SURR	13C2-PFDA
1	03-May-18 00:55	0.259 L	27-Apr-18	B8D0148	Н		70 - 130		68.7	SURR	d5-EtFOSAA

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



Sample ID: V	WI-A06-RW18P-0418									EPA Meth	od 537
Client Data Name:	CH2M Hill	Matrix:		king Water	Lab	oratory Data Sample:	1800728-0		Column	: BEH C18	
Project: Location:	CTO-4041 695610.06.FI.FS DW	Date Col	lected: 20-A	pr-18 10:30	Date	Received:	21-Apr-18	3 09:38			
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		20.5	0.431	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1
PFHxA		29.3	0.847	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1
PFHpA		11.3	0.518	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
PFHxS		125	0.404	4.86	9.73		B8D0148	27-Арг-18	0.257 L	03-May-18 01:07	1
PFOA		30.6	1.05	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
PFNA		1.59	1.40	4.86	9.73	J	B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
PFOS		43.0	1.01	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
PFDA		ND	1.24	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
MeFOSAA		ND	2.96	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1
EtFOSAA		ND	1.88	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1
PFUnA		ND	0.248	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
PFDoA		ND	0.926	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1
PFTrDA		ND	0.917	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
PFTeDA		ND	0.756	4.86	9.73		B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	111		70 - 130			B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	1
13C2-PFDA	SURR	98.6		70 - 130			B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	
d5-EtFOSAA	SURR	76.2		70 - 130			B8D0148	27-Apr-18	0.257 L	03-May-18 01:07	

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

Only the linear isomer is reported for all other analytes.

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Sample ID: V	W1-A06-FB18-0418									EPA Meth	iod 537
Client Data Name: Project:	CH2M Hill CTO-4041 695610.06.FI.FS	Matrix: Date Col		king Water Apr-18 10:27	Lab S	oratory Data Sample: Received:	1800728-0 21-Apr-18		Column	BEH C18	
Location: Analyte	DW	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.415	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
PFHxA		ND	0,815	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
PFHpA		ND	0.499	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
PFHxS		ND	0.388	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
PFOA		ND	1.01	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
PFNA		ND	1.35	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
PFOS		ND	0.974	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
PFDA		ND	1.20	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
MeFOSAA		ND	2.85	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
EtFOSAA		ND	1.81	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1
PFUnA		ND	0.239	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	I
PFDoA		ND	0.891	4.68	9.36		B8D0148	27-Арг-18	0.267 L	03-May-18 01:18	
PFTrDA		ND	0.883	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1
PFTeDA		ND	0.727	4.68	9.36		B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	97.0		70 - 130			B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	1
13C2-PFDA	SURR	101		70 - 130			B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	
d5-EtFOSAA	SURR	82.9		70 - 130			B8D0148	27-Apr-18	0.267 L	03-May-18 01:18	

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



Sample ID: V	VI-A06-RW20-0418									EPA Meth	od 537
Client Data Name: Project: Location:	CH2M Hill CTO-4041 695610.06.FI.FS DW	Matrix: Date Coll		king Water Apr-18 10:10	Lab S	oratory Data Sample: Received:	1800728-0 21-Apr-18		Column	: BEH C18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		20.0	0.429	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
PFHxA		19.1	0.843	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	
PFHpA		3.33	0.516	4.84	9.68	J	B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	
PFHxS		118	0.402	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	
PFOA		43.7	1.05	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	
PFNA		ND	1.39	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	
PFOS		30.5	1.01	4.84	9.68		B8D0148	27-Арг-18	0.258 L	03-May-18 01:30	1
PFDA		ND	1.24	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
MeFOSAA		ND	2.94	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
EtFOSAA		ND	1.87	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	Ĩ
PFUnA		ND	0.247	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
PFDoA		ND	0.922	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
PFTrDA		ND	0.913	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
PFTeDA		ND	0.752	4.84	9.68		B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	91.9		70 - 130			B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
13C2-PFDA	SURR	101		70 - 130			B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1
d5-EtFOSAA	SURR	82.3		70 - 130			B8D0148	27-Apr-18	0.258 L	03-May-18 01:30	1

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



Sample ID: W1-A06-FB20-0418 EPA Method 537											
Client Data Name: Project: Location:	CH2M Hill CTO-4041 695610.06.FI.FS DW	Matrix: Date Col		nking Water Apr-18 10:10	Lab S	oratory Data Sample: Received:	1800728-0 21-Apr-18		Column	: ВЕН С18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.412	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFHxA		ND	0.811	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFHpA		ND	0.496	4.66	9.31		B8D0148	27-Арг-18	0.268 L	03-May-18 01:41	1
PFHxS		ND	0.386	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFOA		ND	1.01	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFNA		ND	1.34	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFOS		ND	0.968	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFDA		ND	1.19	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
MeFOSAA		ND	2.83	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
EtFOSAA		ND	1.80	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFUnA		ND	0.237	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFDoA		ND	0.886	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFTrDA		ND	0.878	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
PFTeDA		ND	0.723	4.66	9.31		B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	96.0		70 - 130			B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
13C2-PFDA	SURR	83.4		70 - 130			B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1
d5-EtFOSAA	SURR	87.9		70 - 130			B8D0148	27-Apr-18	0.268 L	03-May-18 01:41	1

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

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

Page 12 of 155 Work Order 1800728



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-76250-1

Laboratory: Test America Laboratories, Tacoma, Washington Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: June 4, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW19-0318	580-76250-1	Water
1MS	WI-A06-RW19-0318MS	580-76250-1MS	Water
1MSD	WI-A06-RW19-0318MSD	580-76250-1MSD	Water
2*	WI-A06-TB01-032818	580-76250-2	Water

^{* -} VOC only

A full data validation was performed on the analytical data for one water sample and one aqueous trip blank sample collected on March 28, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

All criteria were met.

Initial Calibration

 The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-032818	Vinyl Chloride	0.018	U	1

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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

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

Laboratory Control Samples

• 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.

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC samples were not analyzed.

Surrogate Spike Recoveries

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

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

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

Laboratory Control Samples

• 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 (757) 564-0090 if you have any questions or need further information. Mancy Weaver Dated: 6(5/18

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

Client: CH2M Hill, Inc.

Job Number: 580-76250-1

Client Sample ID:

WI-A06-RW19-0318

Lab Sample ID:

580-76250-1

Client Matrix:

Water

Date Sampled: 03/28/2018 1325 Date Received: 04/03/2018 0945

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM

5030B

Analysis Batch:

580-270777

Instrument ID:

TAC036

Prep Method: Dilution:

1.0

Prep Batch:

Lab File ID:

N/A

040518_08.D

Analysis Date:

Initial Weight/Volume: 5 mL

Prep Date:

Vinyl chloride

04/05/2018 1824 04/05/2018 1824

Final Weight/Volume: 5 mL

Analyte

0.040

Result (ug/L) Qualifier 0.019 LA M

DL 0.013 LOQ 0.50

TBL

Surrogate Trifluorotoluene (Surr)

Dibromofluoromethane (Surr)

%Rec 101 100

M

Qualifier

80 - 141 77 - 118

Acceptance Limits

Client: CH2M Hill, Inc. Job Number: 580-76250-1

Client Sample ID:

WI-A06-TB01-032818

Lab Sample ID:

580-76250-2

Client Matrix:

Water

Date Sampled: 03/28/2018 1320 Date Received: 04/03/2018 0945

8260C SIM Volatile Organic Compounds (GC/MS)

Analysis Method: 8260C SIM Prep Method:

5030B

1.0

Dilution: Analysis Date:

Prep Date:

04/05/2018 1935

04/05/2018 1935

Analysis Batch: Prep Batch:

580-270777

N/A

Instrument ID: Lab File ID:

TAC036 040518_11.D

Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Analyte Result (ug/L) Qualifier DL LOQ Vinyl chloride 0.013 0.018 JM 0.50

Surrogate %Rec Qualifier **Acceptance Limits** Triffuorotoluene (Surr) 101 80 - 141 Dibromofluoromethane (Surr) 99 M 77 - 118

Client: CH2M Hill, Inc.

Job Number: 580-76250-1

Client Sample ID:

WI-A06-RW19-0318

Lab Sample ID: **Client Matrix:**

580-76250-1

Water

Date Sampled: 03/28/2018 1325 Date Received: 04/03/2018 0945

8270D SIM Semivolatile Organic Compounds (GC/MS SIM)

Analysis Method:

8270D SIM 3520C

Analysis Batch:

580-270894

Instrument ID:

TAC050

Prep Method: Dilution:

1.0

Prep Batch:

580-270601

Lab File ID:

040818a007.D

Analysis Date: Prep Date:

04/08/2018 1440 04/04/2018 1255 Initial Weight/Volume: 1023.1 mL

Final Weight/Volume: Injection Volume:

2 mL 1 uL.

Analyte 1,4-Dioxane Result (ug/L)

Qualifier

DL 0.011

LOQ 0.098

Surrogate 2-Fluorophenol %Rec

0.029

Qualifier

Acceptance Limits

84



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

1800600

Laboratory:

Vista Analytical Laboratory, El Dorado Hills, California NAS Whidbey Island, Area 6, CTO-4041, Washington

Site: Date:

June 4, 2018

PFCs							
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix				
1	WI-A06-RW19-0318	1800600-01	Water				
1MS	WI-A06-RW19-0318MS	1800600-01MS	Water				
1MSD	WI-A06-RW19-0318MSD	1800600-01MSD	Water				
2	WI-A06-FB19-0318	1800600-02	Water				

A full data validation was performed on the analytical data for one water sample, and one aqueous field blank sample collected on March 28, 2018 by CH2M HILL at the NAS Whidbey Island Area 6 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:

<u>Analysis</u> PFCs Method References

USEPA Method 537 Modified

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Superfund Organic Methods Data Review," January 2017;
- 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
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall 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 Compounds (PFCs)

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.

GC/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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB19-0318	None - ND	-		5

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

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

EDS Sample ID	Compound	MS %R/MSD %R/RPD	Qualifier
1	PFHxS	OK/151%/53.4	J

Laboratory Control Samples

• 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 (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 6(5/18

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



37	hod 537	EPA Met									-RW19-0318	Sample ID: V
		: BEH C18	Column:		1800600-0 04-Apr-18	ratory Data ample: Received:	Lab S	ng Water rr-18 13:25		Matrix: Date Colle	1 Hill 4041, Whidbey Island Area 6	Client Data Name: Project: Location:
ion	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers	LOQ	LOD	DL	Conc. (ng/L)		Analyte
\neg	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.444	64.7		PFBS
	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.873	61.8		PFHxA
	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.534	33.4		PFHpA
	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.416	233 丁		PFHxS
	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	1.08	44.7		PFOA
		07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033	J	10.0	5.02	1.44	2.36		PFNA
	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	1.04	75.1		PFOS
	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	1.28	ND		PFDA
		08-Apr-18 19:11	0.249 L	05-Apr-18	B8D0033		10.0	5.02	3.05	ND		MeFOSAA
		08-Apr-18 19:11	0.249 L	05-Apr-18	B8D0033		10.0	5.02	1.93	ND		EtFOSAA
		07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.256	ND		PFUnA
		07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.954	ND		PFDoA
		07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.945	ND		PFTrDA
	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033		10.0	5.02	0.779	ND		PFTeDA
on	Dilution	Analyzed	Samp Size	Extracted	Batch	Qualifiers		Limits		% Recovery	Туре	Labeled Standa
1	1	07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033			70 - 130		102	SURR	13C2-PFHxA
		07-Apr-18 21:26	0.249 L	05-Apr-18	B8D0033			70 - 130		95.1	SURR	13C2-PFDA
		08-Apr-18 19:11	0.249 L	05-Apr-18	B8D0033			70 - 130		85.8	SURR	d5-EtFOSAA

LOD - Limit of Detection

LOQ - Limit of quantitation

LCL-UCL- Lower control limit - upper control limit Results reported to the DL When reported, PFHxS, PFOA and PFOS include both linear and branched isomers

Only the linear isomer is reported for all other analytes

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Sample ID: W	I-A06-FB19-0318									EPA Meth	nod 537
Client Data Name: Project: Location:	CH2M Hill CTO-4041, Whidbey Island Area 6 DW	Matrix: Date Colle		rinking Water 8-Mar-18 13:25	Lab S	oratory Data Sample: Received:	1800600-0 04-Apr-18	_	Column	: ВЕН С18	
Analyte		Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		ND	0.428	4.83	9.67		B8D0033	05-Арг-18	0.259 L	07-Apr-18 21:37	1
PFHxA		ND	0.842	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFHpA		ND	0.515	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFHxS		ND	0.401	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	
PFOA		ND	1.04	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	
PFNA		ND	1.39	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFOS		ND	1.01	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFDA		ND	1.24	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
MeFOSAA		ND	2.94	4.83	9.67		B8D0033	05-Apr-18	0.259 L	08-Apr-18 19:22	1
EtFOSAA		ND	1.87	4.83	9.67		B8D0033	05-Apr-18	0.259 L	08-Apr-18 19:22	
PFUnA		ND	0.247	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFDoA		ND	0.921	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
PFTrDA		ND	0.912	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Арг-18 21:37	1
PFTeDA		ND	0.751	4.83	9.67		B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
Labeled Standard	ls Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	98.1		70 - 130			B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
13C2-PFDA	SURR	91.7		70 - 130			B8D0033	05-Apr-18	0.259 L	07-Apr-18 21:37	1
d5-EtFOSAA	SURR	98.2		70 - 130			B8D0033	05-Apr-18	0.259 L	08-Apr-18 19:22	1

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

580-79924-1

Laboratory:

Test America Laboratories, Tacoma, Washington

Site:

NAS Whidbey Island, Area 6, CTO-4041, Washington

Date:

October 28, 2018

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW21-0818	580-79924-1	Water
1MS	WI-A06-RW21-0818MS	580-79924-1MS	Water
1MSD	WI-A06-RW21-0818MSD	580-79924-1MSD	Water
2	WI-A06-RW21P-0818	580-79924-2	Water
3*	WI-A06-TB01-082718	580-79924-3	Water

^{* -} VOC only

A full data validation was performed on the analytical data for two water samples and one aqueous trip blank sample collected on August 27, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

<u>Analysis</u>

Method References

VOC (Vinyl Chloride) SVOC (1,4-Dioxane)

USEPA SW-846 Method 8260C SIM USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-TB01-082718	None - ND		250	(a)

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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	Affected Samples
1	Vinyl Chloride	OK/OK/35	None	For RPD Alone

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

Compound	WI-A06-RW21-0818 ug/L	WI-A06-RW21P-0818 ug/L	RPD	Qualifier
None	ND	ND	(#E	=

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC samples were not analyzed.

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	Affected Samples
1	1,4-Dioxane	OK/OK/29	None	For RPD Alone

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

Compound	WI-A06-RW21-0818 ug/L	WI-A06-RW21P-0818 ug/L	RPD	Qualifier
None	ND	ND	1,51	=

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver Dated: 10/29/18

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle	Job No.: 580-79924-1
SDG No.:	
Client Sample ID: WI-A06-RW21-0818	Lab Sample ID: 580-79924-1
Matrix: Water	Lab File ID: 082918_16.D
Analysis Method: 8260C SIM	Date Collected: 08/27/2018 11:20
Sample wt/vol: 5(mL)	Date Analyzed: 08/29/2018 21:23
Soil Aliquot Vol:	Dilution Factor: 1
Soil Extract Vol.:	GC Column: DB-VRX ID: 0.25 (mm)
% Moisture:	Level: (low/med) Low
Analysis Batch No.: 282817	Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U /	0.50	0.019

CAS NO.	SURROGATE	%REC	Q LIMITS
98-08-8	Trifluorotoluene (Surr)	113	80-120
1868-53-7	Dibromofluoromethane (Surr)	102	80-120

Lab Name: TestAmerica Seattle Job No.: 580-79924-1 SDG No.: Client Sample ID: WI-A06-RW21P-0818 Lab Sample ID: 580-79924-2 Matrix: Water Lab File ID: 082918 19.D Analysis Method: 8260C SIM Date Collected: 08/27/2018 11:20 Sample wt/vol: 5(mL) Date Analyzed: 08/29/2018 22:32 Soil Aliquot Vol: Dilution Factor: 1 Soil Extract Vol.: GC Column: DB-VRX ID: $0.25 \, (mm)$ % Moisture: Level: (low/med) Low Analysis Batch No.: 282817 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	113		80-120
1868-53-7	Dibromofluoromethane (Surr)	101		80-120

Lab Name: TestAmerica Seattle Job No.: 580-79924-1 SDG No.: Lab Sample ID: 580-79924-3 Client Sample ID: WI-A06-TB01-082718 Matrix: Water Lab File ID: 082918 20.D Analysis Method: 8260C SIM Date Collected: 08/27/2018 07:00 Sample wt/vol: 5(mL) Date Analyzed: 08/29/2018 22:55 Soil Aliquot Vol: Dilution Factor: 1 Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm) % Moisture: Level: (low/med) Low Analysis Batch No.: 282817 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.040	U	0.50	0.019

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	114		80-120
1868-53-7	Dibromofluoromethane (Surr)	104		80-120

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: TestAmerica Seattle Job No.: 580-79924-1 SDG No.: Client Sample ID: WI-A06-RW21-0818 Lab Sample ID: 580-79924-1 Matrix: Water Lab File ID: 0914B016.D Analysis Method: 8270D SIM Date Collected: 08/27/2018 11:20 Extract. Method: 3520C Date Extracted: 08/30/2018 15:12 Sample wt/vol: 982.3(mL) Date Analyzed: 09/15/2018 00:25 Con. Extract Vol.: 2(mL) Dilution Factor: 1 Injection Volume: 1(uL) Level: (low/med) Low % Moisture:

CAS NO. COMPOUND NAME RESULT Q LOQ DL123-91-1 1,4-Dioxane 0.051 U 0.20 0.037

GPC Cleanup: (Y/N) N

Units: ug/L

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	62		53-106

Analysis Batch No.: 284029

Lab Name: TestAmerica Seattle

SDG No.:

Client Sample ID: WI-A06-RW21P-0818 Lab Sample ID: 580-79924-2

Matrix: Water

% Moisture:

Lab File ID: 0914B019.D

Analysis Method: 8270D SIM Extract. Method: 3520C

Sample wt/vol: 974.5(mL)

Con. Extract Vol. 2 (mL)

Injection Volume: 1(uL)

Analysis Batch No.: 284029

Job No.: 580-79924-1

Date Collected: 08/27/2018 11:20

Date Extracted: 08/30/2018 15:12

Date Analyzed: 09/15/2018 01:38

Dilution Factor: 1

Level: (low/med) Low

GPC Cleanup: (Y/N) N

Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.051	U	0.21	0.037

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	56		53-106



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1802795

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 26, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW21-0818	1802795-01	Water
1MS	WI-A06-RW21-0818MS	1802795-01MS	Water
1MSD	WI-A06-RW21-0818MSD	1802795-01MSD	Water
2	WI-A06-RW21P-0818	1802795-02	Water
3	WI-A06-FB21-082718	1802795-03	Water

A full data validation was performed on the analytical data for two water samples and one aqueous field blank sample collected on August 27, 2018 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
PFCs USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB21-082718	None - ND	-	163	:=:

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate %R values.

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 results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-A06-RW21-0818 ng/L	WI-A06-RW21P-0818 ng/L	RPD	Qualifier
None	ND	ND	-	-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Many Weaver Dated: 10/29/18

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: W	I-A06-RW21-0818									EPA Meth	nod 537
Client Data Name: Project: Location:	CH2M Hill Navy Clean NASWI A6/CV DW RW-21	Matrix: Date Coll	Aque ected: 27-A	eous .ug-18 11:20	Lab S	oratory Data Sample: Received:	1802795-0 29-Aug-1		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFHxA	307-24-4	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFHpA	375-85-9	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFHxS	355-46-4	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	î
PFOA	335-67-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFNA	375-95-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFOS	1763-23-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFDA	335-76-2	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	i
MeFOSAA	2355-31-9	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
EtFOSAA	2991-50-6	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	i
PFUnA	2058-94-8	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFDoA	307-55-1	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFTrDA	72629-94-8	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
PFTeDA	376-06-7	ND	2.92	4.81	9.62		B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
Labeled Standard	ls Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	121		70 - 130			B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
13C2-PFDA	SURR	102		70 - 130			B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1
d5-EtFOSAA	SURR	88.6		70 - 130			B8H0245	31-Aug-18	0.260 L	02-Sep-18 18:11	1

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

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



Sample ID: \	WI-A06-RW21P-0818										EPA Meth	nod 537
Client Data Name: Project: Location:	CH2M Hill Navy Clean NASWI A6/C RW-21	V DW	Matrix: Date Colle		Aqueous 27-Aug-18 11:20	Lab	oratory Data Sample: e Received:	1802795-0 29-Aug-18		Column	BEH C18	
Analyte	CA	S Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND	2.96	4.86	9.74		B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
PFHxA	3	307-24-4	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	
PFHpA		375-85-9	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	
PFHxS	3	355-46-4	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	
PFOA		335-67-1	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	0.5
PFNA	3	375-95-1	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	2.5
PFOS	1	763-23-1	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	100
PFDA	3	335-76-2	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	
MeFOSAA	2	355-31-9	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	
EtFOSAA	2	991-50-6	ND	2.96	4.86	9.74			31-Aug-18		02-Sep-18 18:24	O N
PFUnA	2	058-94-8	ND	2.96	4.86	9.74		B8H0245	31-Aug-18		02-Sep-18 18:24	- î
PFDoA	3	307-55-1	ND	2.96	4.86	9.74			31-Aug-18	0.257 L	02-Sep-18 18:24	j l
PFTrDA	72	2629-94-8	ND	2.96	4.86	9.74			31-Aug-18		02-Sep-18 18:24	î
PFTeDA	3	376-06-7	ND	2.96	4.86	9.74			31-Aug-18	0.257 L	-02-Sep-18 18:24	Ŷ.
Labeled Standa	rds 7	уре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA		SURR	108		70 - 130			B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	ı
13C2-PFDA		SURR	85.9		70 - 130			B8H0245	31-Aug-18	0.257 L	02-Sep-18 18:24	1
d5-EtFOSAA		SURR	83.8		70 - 130				31-Aug-18	0.257 L	02-Sep-18 18:24	1

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

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



Sample ID: W	/I-A06-FB21-082718									EPA Meth	10d 537
Client Data Name: Project: Location:	CH2M Hill Navy Clean NASWI A6/CV DW RW-21	Matrix: Date Coll		ueous Aug-18 11:20	Lab S	Sample: Received:	1802795-0 29-Aug-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFHxA	307-24-4	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	
PFHpA	375-85-9	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFHxS	355-46-4	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFOA	335-67-1	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	.77
PFNA	375-95-1	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFOS	1763-23-1	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFDA	335-76-2	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
MeFOSAA	2355-31-9	ND	2,93	4.83	9.65		B8H0245	31-Aug-18		02-Sep-18 18:37	1
EtFOSAA	2991-50-6	ND	2.93	4.83	9.65		B8H0245	31-Aug-18		02-Sep-18 18:37	1
PFUnA	2058-94-8	ND	2.93	4.83	9.65		B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
PFDoA	307-55-1	ND	2.93	4.83	9.65			31-Aug-18		02-Sep-18 18:37	1
PFTrDA	72629-94-8	ND	2.93	4.83	9.65			31-Aug-18	0.259 L	02-Sep-18 18:37	î
PFTeDA	376-06-7	ND	2.93	4.83	9.65			31-Aug-18	0.259 L	02-Sep-18 18:37	1
Labeled Standard	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	101		70 - 130			B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
13C2-PFDA	SURR	89.9		70 - 130			B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1
d5-EtFOSAA	SURR	81.8		70 - 130			B8H0245	31-Aug-18	0.259 L	02-Sep-18 18:37	1

LOD - Limit of Detection LOQ - Limit of quantitation

Results reported to the DL.

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

580-85553-1

Laboratory:

Eurofins Test America Laboratories, Tacoma, Washington

Site:

NAS Whidbey Island, Area 6, CTO-4041, Washington

Date:

May 31, 2019

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW22-0419	580-85553-1	Water
1MS	WI-A06-RW22-0419MS	580-85553-1MS	Water
1MSD	WI-A06-RW22-0419MSD	580-85553-1MSD	Water
2	WI-A06-RW22P-0419	580-85553-2	Water

A full data validation was performed on the analytical data for two water samples collected on April 17, 2019 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

<u>Analysis</u>

SVOC (1,4-Dioxane)

Method References

USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days.

GC/MS Tuning

All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-041719	None - ND	35	:72	*

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	Affected Samples
1	1,4-Dioxane	OK/OK/37	None	None for RPD Alone

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

Compound	WI-A06-RW22-0419 ug/L	WI-A06-RW22P-0419 ug/L	RPD	Qualifier
None	ND	ND		-

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Nancy Weaver Senior Chemist Dated: __6/1/9

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Seattle

SDG No.:

Client Sample ID: WI-A06-RW22-0419

Matrix: Water

Lab Sample ID: 580-85553-1

Lab File ID: adec042419a012.D

Analysis Method: 8270D SIM Date Collected: 04/17/2019 16:35

Extract. Method: 3520C Date Extracted: 04/22/2019 13:41
Sample wt/vol: 1052.8(mL) Date Analyzed: 04/24/2019 14:40

Con. Extract Vol.: 2(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low

% Moisture: GPC Cleanup:(Y/N) N
Analysis Batch No.: 299286 Units: ug/L

CAS NO. COMPOUND NAME RESULT Q LOQ DL

123-91-1 1,4-Dioxane 0.047 U 0.19 0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	85	M	53-106

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

2

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85553-1

SDG No.:

Client Sample ID: WI-A06-RW22P-0419 Lab Sample ID: 580-85553-2

Matrix: Water Lab File ID: adec042419a015.D

Analysis Method: 8270D SIM Date Collected: 04/17/2019 17:35

Extract. Method: 3520C Date Extracted: 04/22/2019 13:41

Sample wt/vol: 1047.8(mL) Date Analyzed: 04/24/2019 15:46

Con. Extract Vol.: 2(mL) Dilution Factor: 1

Injection Volume: 1(uL) Level: (low/med) Low % Moisture: GPC Cleanup:(Y/N) N

Analysis Batch No.: 299286 Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.048	Ū	0.19	0.034

CAS NO.	SURROGATE	%REC	Q	LIMITS
367-12-4	2-Fluorophenol	88	M	53-106

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DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-85578-1

Laboratory: Eurofins Test America Laboratories, Tacoma, Washington Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: May 31, 2019

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-EB01-041719	580-85578-1	Water
1RE†	WI-A06-EB01-041719RE	580-85578-1RE	Water
2*	WI-A06-RW22-0419	580-85578-2	Water
2MS*	WI-A06-RW22-0419MS	580-85578-2MS	Water
2MSD*	WI-A06-RW22-0419MSD	580-85578-2MSD	Water
3*	WI-A06-RW22P-0419	580-85578-3	Water
4*	WI-A06-TB01-041719	580-85578-4	Water

^{* -} VOC only † - SVOC only

A full data validation was performed on the analytical data for two water samples, one aqueous equipment blank sample and one aqueous trip blank sample collected on April 17, 2019 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions".

Specific method references are as follows:

Analysis Method References

VOC (Vinyl Chloride) USEPA SW-846 Method 8260C SIM SVOC (1,4-Dioxane) USEPA SW-846 Method 8270D SIM

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Organics

- Holding times and sample preservation
- Gas Chromatography/Mass Spectrometry (GC/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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were rejections of data. This data cannot be used in the decision-making process for this project.

• 1,4-Dioxane was rejected in one reanalysis sample due to grossly exceeded holding times. This result was not used for reporting purposes.

Overall the remaining 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.

Volatile Organic Compounds (Vinyl Chloride)

Holding Times

• All samples were analyzed within 14 days for preserved water samples.

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria except for the following.

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
04/30/19 (1832)	Vinyl Chloride	31.5%	UJ	1, 2, 3, 4

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-041719	None - ND		27.	1#3
WI-A06-TB01-041719	None - ND	#	₹ =	(#.E

Surrogate Spike Recoveries

All samples exhibited acceptable surrogate recoveries.

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	Affected Samples
1	Vinyl Chloride	OK/OK/20	None	None for RPD Alone

Laboratory Control Samples

• 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 results are summarized below. The precision was acceptable.

Compound	WI-A06-RW22-0419 ug/L	WI-A06-RW22P-0419 ug/L	RPD	Qualifier
None	ND	ND	(A)	e

Semivolatile Organic Compounds (1,4-Dioxane)

Holding Times

• All samples were extracted within 7 days for water samples and analyzed within 40 days except for the following.

EDS Sample ID	Date Sampled	Date Extracted	# of Days	Qualifier
1RE	04/17/19	05/16/19	29	R

GC/MS Tuning

• All criteria were met.

Initial Calibration

• The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF criteria.

Continuing Calibration

• The continuing calibrations exhibited acceptable %D and RRF criteria.

Method Blank

• The method blanks were free of contamination.

Field Blank

• Field QC sample result are summarized in the table below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
WI-A06-EB01-041719	None - ND	194	(#3	æ

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate percent recoveries (%R) except for the following.

EDS Sample ID	Surrogate	%R	Qualifier
1	2-Fluorophenol	849%	None - Sample ND

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

MS/MSD samples were not analyzed.

Laboratory Control Samples

The LCS samples exhibited acceptable percent recoveries (%R) except for the following.

LCS ID	Compound	%R	Qualifier	Affected Samples
580-299012/2-A	1,4-Dioxane	38%	UJ	1

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

EDS Sample 1 exhibited surrogate and LCS deficiencies and was re-extracted and reanalyzed. However, the re-extraction was grossly outside of holding times and this result was rejected. The original analysis result should be used for reporting purposes.

6 of 7

Field Duplicate Sample Precision

Field duplicate samples were not analyzed for SVOC.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

May 31, 2019

lancy Wlaver Dated: 6/1/19

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
Ja	The result is an estimated quantity, but the result may be biased low.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limits is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Seattle	Job No.: 580-85578-1	
SDG No.:		
Client Sample ID: WI-A06-EB01-041719	Lab Sample ID: 580-85578-1	
Matrix: Water	Lab File ID: 043019_0022.D	
Analysis Method: 8260C SIM Date Collected: 04/17/2019 18:30		18:30
Sample wt/vol: 5(mL)	Date Analyzed: 04/30/2019	19:42
Soil Aliquot Vol:	Dilution Factor: 1	
Soil Extract Vol.:	GC Column: DB-VRX	ID: 0.25(mm)
% Moisture:	Level: (low/med) Low	
Analysis Batch No.: 299720	Units: ug/L	

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.050	y y us	0.50	0.014

CCH

CAS NO.	SURROGATE	%REC	Q	LIMITS	
98-08-8	Trifluorotoluene (Surr)	102		80-120	
1868-53-7	Dibromofluoromethane (Surr)	84		80-120	

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET



DL

80-120

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1 SDG No.: Client Sample ID: WI-A06-RW22-0419 Lab Sample ID: 580-85578-2 Matrix: Water Lab File ID: 043019 0023.D Analysis Method: 8260C SIM Date Collected: 04/17/2019 16:35 Sample wt/vol: 5(mL) Date Analyzed: 04/30/2019 20:05 Soil Aliquot Vol: Dilution Factor: 1 Soil Extract Vol.: GC Column: DB-VRX ID: 0.25 (mm)% Moisture: Level: (low/med) Low

Analysis Batch No.: 299720 Units: ug/L

COMPOUND NAME

Dibromofluoromethane (Surr)

75-01-4	Vinyl chloride	0.050	to the	0.50	0.014
CAS NO.	SURROGATE		%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)		100		80-120

RESULT

Q

LOQ

84

CAS NO.

1868-53-7

Lab Name: Eur	ofins TestAmerica, Seattle	Job No.: 580-85578-1					
SDG No.:							
Client Sample	ID: WI-A06-RW22P-0419	Lab	Sample ID:	580-855	578-3		
Matrix: Water		Lab	File ID: 0	43019_00)26.D		
Analysis Meth	od: 8260C SIM	Date Collected: 04/17/2019 17:35			35		
Sample wt/vol	: 5 (mL)	Date Analyzed: 04/30/2019 21:16			5		
Soil Aliquot Vol:			Dilution Factor: 1				
Soil Extract	Vol.:	GC Column: DB-VRX ID: 0.25(mm)					
% Moisture:		Lev	el: (low/me	d) Low			
Analysis Bato	h No.: 299720	Uni	ts: ug/L				
CAS NO.	COMPOUND NAME		RESULT	Q	LOQ	DL	

75-01-4	Vinyl chloride	0.050 h duj	0.5	0.014
CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	10	02	80-120
1868-53-7	Dibromofluoromethane (Surr)	5	8.4	80-120

FORM I GC/MS VOA ORGANICS ANALYSIS DATA SHEET

4

Lab Name: Eurofins TestAmerica, Seattle	Job No.: 580-85578-1
SDG No.:	
Client Sample ID: WI-A06-TB01-041719	Lab Sample ID: 580-85578-4
Matrix: Water	Lab File ID: 043019_0027.D
Analysis Method: 8260C SIM	Date Collected: 04/17/2019 13:00
Sample wt/vol: 5(mL)	Date Analyzed: 04/30/2019 21:39
Soil Aliquot Vol:	Dilution Factor: 1
Soil Extract Vol.:	GC Column: DB-VRX ID: 0.25(mm)
% Moisture:	Level: (low/med) Low
Analysis Batch No.: 299720	Units: ug/L

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
75-01-4	Vinyl chloride	0.050	pour	0.50	0.014

CAS NO.	SURROGATE	%REC	Q	LIMITS
98-08-8	Trifluorotoluene (Surr)	101		80-120
1868-53-7	Dibromofluoromethane (Surr)	85		80-120

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

Lab Name: Eurofins TestAmerica, Seattle Job No.: 580-85578-1 SDG No.: Client Sample ID: WI-A06-EB01-041719 Lab Sample ID: 580-85578-1 Matrix: Water Lab File ID: 050919a006.D Analysis Method: 8270D SIM Date Collected: 04/17/2019 18:30 Extract. Method: 3520C Date Extracted: 04/21/2019 13:54 Sample wt/vol: 1014.1(mL) Date Analyzed: 05/09/2019 11:59 Con. Extract Vol.: 2(mL) Dilution Factor: 10 Injection Volume: 1(uL) Level: (low/med) Low % Moisture: GPC Cleanup: (Y/N) N

CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL
123-91-1	1,4-Dioxane	0.49	NOU	UJ 2.0	0.35

SURROGATE

Units: ug/L

&REC Q LIMITS 849 53-106

Analysis Batch No.: 300287

2-Fluorophenol

CAS NO.

367-12-4

FORM I GC/MS SEMI VOA ORGANICS ANALYSIS DATA SHEET

IRE

Lab Name: Eu	Surofins TestAmerica, Seattle Job No.: 580-85578-1					
SDG No.:						
Client Sampl	Le ID: WI-A06-EB01-041719 RE	Lab Sample II	: 580-855	78-1 RE		
Matrix: Wate	er	Lab File ID: 052119a007.D				
Analysis Met	chod: 8270D SIM	Date Collected: 04/17/2019 18:30				
Extract. Met	Extract. Method: 3520C		d: 05/16/	2019 11:1	5 Upl.	
Sample wt/vol: 1024.2(mL)		Date Analyzed: 05/21/2019 12:33				
Con. Extract	Vol.: 2(mL)	Dilution Factor: 1				
Injection Vo	olume: 1(uL)	Level: (low/med) Low				
% Moisture:		GPC Cleanup: (Y N) N				
Analysis Bat	sch No.: 301164	Units: ug/L				
CAS NO.	COMPOUND NAME	RESULT	Q	LOQ	DL	
123-91-1	1,4-Dioxane	0.049	UH R	0.20	0.035	
r:						
CAS NO.	SURROGATE		%REC	Q	LIMITS	
367-12-4	2-Fluorophenol	/	i e	55	53-106	



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

1900794

Laboratory:

Vista Analytical Laboratory, El Dorado Hills, California

Site:

NAS Whidbey Island, Area 06, CTO-4041, Washington

Date:

May 31, 2019

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW22-0419	1900794-01	Water
1MS	WI-A06-RW22-0419MS	1900794-01MS	Water
1MSD	WI-A06-RW22-0419MSD	1900794-01MSD	Water
2	WI-A06-RW22P-0419	1900794-02	Water
3	WI-A06-FB01-041719	1900794-03	Water
4	WI-A06-EB01-041719	1900794-04	Water

A full data validation was performed on the analytical data for two water samples, one aqueous field blank sample and one aqueous equipment blank sample collected on April 17, 2019 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:

<u>Analysis</u> PFCs

Method References

USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB01-041719	None - ND	-0'	:=:	
WI-A06-EB01-041719	None - ND	(FE	1#3	*

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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 results are summarized below. The precision was acceptable.

Compound	WI-A06-RW22-0419 ng/L	WI-A06-RW22P-0419 ng/L	RPD	Qualifier
PFBS	12.8	12.2	5%	None
PFHxS	53.2	47.4	12%	
PFOA	7.72	8.07	4%	
PFOS	54.2	53.2	2%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Vancy Weaver

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: V	WI-A06-RW22-0419										EPA Meth	od 537
Client Data						- 1	oratory Data					
Name:	CH2M Hill		Matrix:		rinking Water	Lab	Sample:	1900794-0	1	Column:	BEH C18	
Project:	NASWI Drinking Water		Date Colle	cted: 1	7-Apr-19 16:35	Date	Received:	19-Apr-19	07:24			
Location:	Area 6-Coachman											
Analyte	CA	S Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	12.8	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFHxA	3	307-24-4	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Арг-19 14:09	1
PFHpA	3	375-85-9	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFHxS	3	355-46-4	53.2	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFOA	3	35-67-1	7.72	3.02	4.96	9.93	J	B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFNA	3	375-95-1	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFOS	1	763-23-1	54.2	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFDA	3	335-76-2	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
MeFOSAA	2.	355-31-9	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
EtFOSAA	2	991-50-6	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFUnA	2	058-94-8	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFDoA	3	307-55-1	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Арг-19 14:09	1
PFTrDA	72	2629-94-8	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
PFTeDA	3	376-06-7	ND	3.02	4.96	9.93		B9D0173	19-Apr-19	0.252 L	23-Арг-19 14:09	1
Labeled Standa	ırds T	уре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	87.1		70 - 130			B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1
13C2-PFDA		SURR	86.1		70 - 130			B9D0173	19-Apr-19	0.252 L	23-Арг-19 14:09	1
d5-EtFOSAA		SURR	78.5		70 - 130			B9D0173	19-Apr-19	0.252 L	23-Apr-19 14:09	1

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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Sample ID: V	WI-A06-RW22P-0419										EPA Meth	10d 537
Client Data Name: Project:	CH2M Hill NASWI Drinking Water		Matrix: Date Colle		inking Water -Apr-19 17:35	Lab	Sample: Received:	1900794-0 19 - Apr-19		Column	BEH C18	
Location:	Area 6-Coachman	an I	0 (11)	DI	LOD	100	01:6	Datab	E-44-d	66!		15.11
Analyte	CA	AS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	12.2	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFHxA		307-24-4	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFHpA		375-85-9	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFHxS		355-46-4	47.4	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFOA		335-67-1	8.07	2.96	4.86	9.72	J	B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFNA		375-95-1	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFOS	1	763-23-1	53.2	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFDA		335-76-2	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
MeFOSAA	2	355-31-9	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
EtFOSAA	2	991-50-6	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFUnA	2	058-94-8	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFDoA		307-55-1	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFTrDA	7:	2629-94-8	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
PFTeDA		376-06-7	ND	2.96	4.86	9.72		B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
Labeled Standa		Гуре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	82.9		70 - 130			B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
13C2-PFDA		SURR	84.6		70 - 130			B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1
d5-EtFOSAA		SURR	83.2		70 - 130			B9D0173	19-Apr-19	0.257 L	23-Apr-19 14:20	1

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.

pu 5/3/1/9

Work Order 1900794 Revision 1 Page 10 of 200



Sample ID: \	WI-A06-FB01-041719	<u> </u>									EPA Meth	od 537
Client Data Name:	CH2M Hill		Matrix:		Drinking Water	Lab	oratory Data Sample:	1900794-0		Column	BEH C18	
Project:	NASWI Drinking Water	er	Date Colle	ected:	17-Apr-19 16:45	Date	e Received:	19-Apr-19	07:24			
Location:	Area 6-Coachman											
Analyte		CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFHxA		307-24-4	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFHpA		375-85-9	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFHxS		355-46-4	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFOA		335-67-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFNA		375-95-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFOS		1763-23-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFDA		335-76-2	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
MeFOSAA		2355-31-9	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
EtFOSAA		2991-50-6	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFUnA		2058-94-8	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFDoA		307-55-1	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFTrDA		72629-94-8	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
PFTeDA		376-06-7	ND	2.89	4.75	9.51		B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1
Labeled Standa	ards	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	88.6		70 - 130			B9D0173	19-Арг-19	0.263 L	23-Apr-19 14:31	1
13C2-PFDA		SURR	91.9		70 - 130			B9D0173	19-Apr-19	0.263 L	23-Арг-19 14:31	1
d5-EtFOSAA		SURR	88.4		70 - 130			B9D0173	19-Apr-19	0.263 L	23-Apr-19 14:31	1

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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Sample ID: V	WI-A06-EB01-041719										EPA Meth	od 537
Client Data Name: Project: Location:	CH2M Hill Matrix: Drinking Water t: NASWI Drinking Water Date Collected: 17-Apr-19 18:30		_	Laboratory Data Lab Sample: Date Received:		1900794-04 19-Apr-19 07:24		Column:	BEH C18			
Analyte		CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFHxA		307-24-4	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFHpA		375-85-9	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFHxS		355-46-4	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFOA		335-67-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFNA		375-95-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	Ī
PFOS		1763-23-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFDA		335-76-2	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	Ĭ.
MeFOSAA		2355-31-9	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
EtFOSAA		2991-50-6	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFUnA		2058-94-8	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFDoA		307-55-1	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFTrDA		72629-94-8	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
PFTeDA		376-06-7	ND	3.01	4.94	9.89		B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
Labeled Standa	ards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	86.8		70 - 130			B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
13C2-PFDA		SURR	86.8		70 - 130			B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1
d5-EtFOSAA		SURR	87.2		70 - 130			B9D0173	19-Apr-19	0.253 L	23-Apr-19 14:41	1

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.

New 5/3/1/19

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DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-79965-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 28, 2018

		Metals	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW05-0818	580-79965-1	Water
1D	WI-A06-RW05-0818	580-79965-1	Water
2	WI-A06-RW18-0818	580-79965-2	Water
2D	WI-A06-RW18-0818	580-79965-2	Water

D - Dissolved Metals

A full data validation was performed on the analytical data for two water samples collected on August 29, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis Method References

Metals (Total Iron) USEPA SW-846 Method 6010C Metals (Dissolved) USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications

- Method blank and field QC blank contamination
- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Metals (Total Iron/Dissolved Metals)

Holding Times

All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

Not applicable.

Initial Calibration Verification

• All initial calibration criteria were met.

Continuing Calibration Verification

• All continuing calibration criteria were met.

Method Blank

• The method blanks were free of contamination.

Field QC Blank

• Field QC samples were not analyzed for metals.

ICP Interference Check Sample

• The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

• The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

• MS/MSD samples were not analyzed.

Duplicate Sample Analysis

Duplicate samples were not analyzed.

ICP Serial Dilution

An ICP serial dilution was not analyzed.

Compound Quantitation

• All criteria were met.

Field Duplicate Sample Precision

• Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Nancy Weaver Senior Chemist

laney Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - TOTAL RECOVERABLE

Client Sample ID: WI-A06-RW05-0818 Lab Sample ID: 580-79965-1

Lab Name: TestAmerica Seattle Job No.: 580-79965-1

SDG ID.:

Matrix: Water Date Sampled: 08/29/2018 11:00

Reporting Basis: WET Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - DISSOLVED

D

Client Sample ID: WI-A06-RW05-0818

Lab Name: TestAmerica Seattle

SDG ID.:

Matrix: Water

Date Sampled: 08/29/2018 11:00

Reporting Basis: WET

Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	43	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	44	1.1	0.13	mg/L			1	6010C
7439-96-5	Manganese	0.0050	0.020	0.0017	mg/L	J		1	6010C
7440-09-7	Potassium	3.2	3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	17	1.1	0.063	mq/L			1	6010C

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - TOTAL RECOVERABLE

2

Client Sample ID: WI-A06-RW18-0818

Lab Sample ID: 580-79965-2

Lab Name: TestAmerica Seattle

Job No.: 580-79965-1

SDG ID.:

Matrix: Water

Date Sampled: 08/29/2018 13:25

Reporting Basis: WET Date Rece:

Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7439-89-6	Iron	0.49	0.50	0.14	mg/L	J		1	6010C

20

Client Sample ID: WI-A06-RW18-0818

Lab Sample ID: 580-79965-2

Lab Name: TestAmerica Seattle

Reporting Basis: WET

Job No.: 580-79965-1

SDG ID.:

Matrix: Water

Date Sampled: 08/29/2018 13:25

Date Received

Date Received: 08/30/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	39	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	45	1,1	0.13	mg/L			1	6010C
/439-96-5	Manganese	0.081	0.020	0.0017	mg/L			1	6010C
7440-09-7	Potassium	3.5	3.3	0.41	mg/L			1	6010C
7440-21-3	Silicon	13	1.1	0.063	mg/L			1	6010C



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1802843

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 26, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW05-0818	1802843-01	Water
2	WI-A06-FB05-0818	1802843-02	Water
3	WI-A06-RW18-0818	1802843-03	Water
4	WI-A06-FB18-0818	1802843-04	Water
5	WI-A06-RW20-0818	1802843-05	Water
6	WI-A06-FB20-0818	1802843-06	Water

A full data validation was performed on the analytical data for three water samples and three aqueous field blank samples collected on August 29-30, 2018 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
PFCs USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB05-0818	None - ND			3/
WI-A06-FB18-0818	None - ND		(- 2	<u> </u>
WI-A06-FB20-0818	None - ND	a	æ	3

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

MS/MSD samples were not analyzed.

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 (757) 564-0090 if you have any questions or need further information.

Signed:

llaucipleaver Dated: 10/29/18

Senior Chemist

October 26, 2018

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID:	WI-A06-RW05-0818									EPA Meth	hod 537
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base DW RW-05	Matrix: Date Coll		king Water ug-18 11:00	Lab	Sample: Received:	1802843-0 01-Sep-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	26.2	3.03	4.98	9.98		B8I0027	06-Sep-18	0.251 L	10-Sep-18 11:00	1
PFHxA	307-24-4	37.5	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	(0)
PFHpA	375-85-9	16.2	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	577
PFHxS	355-46-4	200	3.03	4.98	9.98		B8I0027	06-Sep-18	0.251 L	10-Sep-18 11:00	
PFOA	335-67-1	55.4	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	
PFNA	375-95-1	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	
PFOS	1763-23-1	95.3	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	
PFDA	335-76-2	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	93
MeFOSAA	2355-31-9	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	2.2
EtFOSAA	2991-50-6	ND	3.03	4.98	9.98		B8I0027	06-Sep-18	0.251 L	10-Sep-18 11:00	
PFUnA	2058-94-8	ND	3.03	4.98	9.98		B8I0027	06-Sep-18	0.251 L	10-Sep-18 11:00	
PFDoA	307-55-1	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	
PFTrDA	72629-94-8	ND	3.03	4.98	9.98		B8I0027	06-Sep-18	0.251 L	10-Sep-18 11:00	- 13
PFTeDA	376-06-7	ND	3.03	4.98	9.98		B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	
Labeled Standa	ards Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	115		70 - 130			B8I0027	06-Sep-18	0.251 L	10-Sep-18 11:00	1
13C2-PFDA	SURR	107		70 - 130			B810027	06-Sep-18	0.251 L	10-Sep-18 11:00	100
d5-EtFOSAA	SURR	84.5		70 - 130			B8I0027	06-Sep-18	0.251 L	10-Sep-18 11:00	

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

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



Sample ID: W	/I-A06-FB05-0818									EPA Meth	nod 537
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASW! A6 Off-Base DW RW-05	Matrix: Date Coll	Aquected: 29-A	eous Aug-18 11:05	Lab S	Sample: Received:	1802843-0 01-Sep-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1
PFHxA	307-24-4	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFHpA	375-85-9	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFHxS	355-46-4	ND	3.19	5.23	10.5		B8I0027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFOA	335-67-1	ND	3.19	5.23	10.5		B8I0027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFNA	375-95-1	ND	3.19	5.23	10.5		B8I0027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFOS	1763-23-1	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFDA	335-76-2	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
MeFOSAA	2355-31-9	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
EtFOSAA	2991-50-6	ND	3.19	5.23	10.5		B810027	06-Sep-18	0,239 L	10-Sep-18 11:13	
PFUnA	2058-94-8	ND	3.19	5.23	10.5		B8I0027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFDoA	307-55-1	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
PFTrDA	72629-94-8	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1
PFTeDA	376-06-7	ND	3.19	5.23	10.5		B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	108		70 - 130			B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	1
13C2-PFDA	SURR	98.1		70 - 130			B810027	06-Sep-18	0.239 L	10-Sep-18 11:13	
d5-EtFOSAA	SURR	84.3		70 - 130			B8I0027	06-Sep-18	0.239 L	10-Sep-18 11:13	1

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

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



Sample ID: V	VI-A06-RW18-0818									EPA Meth	10d 537
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base DW RW-18	Matrix: Date Coll		king Water Aug-18 13:25	Lab :	oratory Data Sample: Received:	1802843-0 01-Sep-18		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	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFHxA	307-24-4	27.8	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFHpA	375-85-9	11.4	3.34	5.51	11.0		B8I0027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
PFHxS	355-46-4	87.5	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFOA	335-67-1	26.1	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFNA	375-95-1	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFOS	1763-23-1	18.0	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFDA	335-76-2	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
MeFOSAA	2355-31-9	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
EtFOSAA	2991-50-6	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFUnA	2058-94-8	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFDoA	307-55-1	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFTrDA	72629-94-8	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
PFTeDA	376-06-7	ND	3.34	5.51	11.0		B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	
Labeled Standa		% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	111		70 - 130			B810027	06-Sep-18	0.227 L	10-Sep-18 11:26	1
13C2-PFDA	SURR	103		70 - 130			B8I0027	06-Sep-18	0.227 L	10-Sep-18 11:26	
d5-EtFOSAA	SURR	96.4		70 - 130			B8I0027	06-Sep-18	0.227 L	10-Sep-18 11:26	1.27

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

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



Sample ID: V	VI-A06-FB18-0818									EPA Meth	hod 537
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base DW RW-18	Matrix: Date Coll	Aque ected: 29-A	ous ug-18 13:30	Lab S	oratory Data Sample: Received:	1802843-0 01-Sep-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFHxA	307-24-4	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFHpA	375-85-9	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
PFHxS	355-46-4	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	Ī
PFOA	335-67-1	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFNA	375-95-1	ND	3.15	5.19	10.4		B8I0027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFOS	1763-23-1	ND	3.15	5.19	10.4		B8I0027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFDA	335-76-2	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
MeFOSAA	2355-31-9	ND	3.15	5.19	10.4		B8I0027	06-Sep-18	0.241 L	10-Sep-18 11:39	
EtFOSAA	2991-50-6	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFUnA	2058-94-8	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFDoA	307-55-1	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFTrDA	72629-94-8	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
PFTeDA	376-06-7	ND	3.15	5.19	10.4		B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	104		70 - 130			B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	1
13C2-PFDA	SURR	106		70 - 130			B810027	06-Sep-18	0.241 L	10-Sep-18 11:39	
d5-EtFOSAA	SURR	87.9		70 - 130			B8I0027	06-Sep-18	0.241 L	10-Sep-18 11:39	

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

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



Sample ID: V	VI-A06-RW20-0818									EPA Met	hod 537
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base DW RW-20	Matrix: Date Coll		king Water aug-18 09:00	Lab	oratory Data Sample: Received:	1802843- 01-Sep-18		Column	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	18.7	3.14	5.17	10.3		B8I0027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
PFHxA	307-24-4	17.5	3.14	5.17	10.3		B8I0027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFHpA	375-85-9	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFHxS	355-46-4	119	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFOA	335-67-1	45.3	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFNA	375-95-1	ND	3.14	5.17	10.3		B8I0027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFOS	1763-23-1	27.8	3.14	5.17	10.3		B8I0027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFDA	335-76-2	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
MeFOSAA	2355-31-9	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
EtFOSAA	2991-50-6	ND	3.14	5.17	10.3		B8I0027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFUnA	2058-94-8	ND	3.14	5.17	10.3		B8I0027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFDoA	307-55-1	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFTrDA	72629-94-8	ND	3.14	5.17	10.3		B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
PFTeDA	376-06-7	ND	3.14	5.17	10.3		B8I0027	06-Sep-18	0,242 L	10-Sep-18 11:52	
Labeled Standa	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	116		70 - 130			B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	1
13C2-PFDA	SURR	96.2		70 - 130			B810027	06-Sep-18	0.242 L	10-Sep-18 11:52	
d5-EtFOSAA	SURR	75.8		70 - 130			B8I0027	06-Sep-18	0.242 L	10-Sep-18 11:52	

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

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



Sample ID: W	VI-A06-FB20-0818									EPA Meth	nod 537
Client Data Name: Project: Location:	CH2M Hill Navy CLEAN NASWI A6 Off-Base DW RW-20	Matrix: Date Coll		neous Aug-18 09:00	Lab S	oratory Data Sample: Received:	1802843-0 01-Sep-18		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1
PFHxA	307-24-4	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFHpA	375-85-9	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	1
PFHxS	355-46-4	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFOA	335-67-1	ND	3.13	5.14	10.3		B8I0027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFNA	375-95-1	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFOS	1763-23-1	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFDA	335-76-2	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
MeFOSAA	2355-31-9	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
EtFOSAA	2991-50-6	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFUnA	2058-94-8	ND	3.13	5.14	10.3		B8I0027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFDoA	307-55-1	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFTrDA	72629-94-8	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
PFTeDA	376-06-7	ND	3.13	5.14	10.3		B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	
Labeled Standar	rds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	110		70 - 130			B8I0027	06-Sep-18	0.243 L	10-Sep-18 12:05	1
13C2-PFDA	SURR	108		70 - 130			B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	50/
d5-EtFOSAA	SURR	91.0		70 - 130			B810027	06-Sep-18	0.243 L	10-Sep-18 12:05	50

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

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client:

CH2M HILL, Inc., Corvallis, Oregon

SDG:

580-80659-1

Laboratory:

Test America Laboratories, Tacoma, Washington

Site:

NAS Whidbey Island, Residential Wells, CTO-4041, Washington

Date:

January 29, 2019

		Metals	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW08-0918	580-80659-1	Water
1MS	WI-A06-RW08-0918MS	580-80659-1MS	Water
1MSD	WI-A06-RW08-0918MSD	580-80659-1MSD	Water

A full data validation was performed on the analytical data for one water sample collected on September 27, 2018 by CH2MM HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis

Method References

Metals (Total Iron)
Metals (Dissolved)

USEPA SW-846 Method 6010C USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- · and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications
- Method blank and field QC blank contamination
- ICP Interference Check Sample

- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is 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.

Metals (Total Iron/Dissolved Metals)

Holding Times

• All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

Not applicable.

Initial Calibration Verification

• All initial calibration criteria were met.

Continuing Calibration Verification

All continuing calibration criteria were met.

Method Blank

• The method blanks were free of contamination.

Field QC Blank

• Field QC samples were not analyzed for metals.

ICP Interference Check Sample

• The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

• The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

• The MS/MSD samples exhibited acceptable %R and RPD values.

Duplicate Sample Analysis

• The duplicate sample analysis exhibited acceptable RPD values.

ICP Serial Dilution

• ICP serial dilution percent differences (%D) were within acceptance limits except for the following.

ICP SD Sample	Compound	%D	Qualifier	Affected Samples
1	Calcium	22%	J	1
	Magnesium	20%	Ĵ	
	Manganese	21%	J	
	Silicon	21%	J	

Compound Quantitation

All criteria were met.

Field Duplicate Sample Precision

Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information. laucy bleaver Dated: 1130 19

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - TOTAL RECOVERABLE

Client Sample ID: W1-A06-RW08-0918 Lab Sample ID: 580-80659-1

Lab Name: TestAmerica Seattle Job No.: 580-80659-1

SDG ID.:

Matrix: Water Date Sampled: 09/27/2018 12:40

Reporting Basis: WET Date Received: 09/28/2018 09:30

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	u		1	6010C

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - DISSOLVED

Client Sample ID: W1-A06-RW08-0918	Lab Sample ID: 580-80659-1
Lab Name: TestAmerica Seattle	Job No.: 580-80659-1
SDG ID.:	
Matrix: Water	Date Sampled: 09/27/2018 12:40
Reporting Basis: WET	Date Received: 09/28/2018 09:30

CAS No.	Analyte	Result		LOQ	DL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	0.44		1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	36	J	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47		0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	45	J	1.1	0.13	mg/L		1	1	6010C
7439-96-5	Manganese	0.22	7	0.020	0.0017	mg/L			1	6010C
7440-09-7	Potassium	3.1		3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	17	J	1.1	0.063	mq/L			1	6010C



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1803198

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California

Site: NAS Whidbey Island, Residential Wells, CTO-4041, Washington

Date: January 30, 2019

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-CV-1RW40-0918	1803198-01	Water
2	WI-CV-1FB40-0918	1803198-02	Water
3	WI-CV-1RW72-0918	1803198-03	Water
4	WI-CV-1RW72P-0918	1803198-04	Water
5	WI-CV-1FB72-0918	1803198-05	Water
6	WI-CV-2RW02-0918	1803198-06	Water
7	WI-CV-2FB02-0918	1803198-07	Water
8	WI-CV-1RW90-0918	1803198-08	Water
9	WI-CV-1FB90-0918	1803198-09	Water
10	WI-A06-RW08-0918	1803198-10	Water
11	WI-A06-FB08-0918	1803198-11	Water
12	WI-AF-3RW41-0918	1803198-12	Water
13	WI-AF-3RW41P-0918	1803198-13	Water
14	WI-AF-3FB41-0918	1803198-14	Water
15	WI-CV-1RW04-0918	1803198-15	Water
16	WI-CV-1FB04-0918	1803198-16	Water

A full data validation was performed on the analytical data for nine water samples and seven aqueous field blank samples collected on September 24-27, 2018 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

PFCs USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-CV-1FB40-0918	None - ND	1		3
WI-CV-1FB72-0918	None - ND	E E	è	
WI-CV-2FB02-0918	WI-CV-2FB02-0918 None - ND		-	9
WI-CV-1FB90-0918	None - ND	5	-	=
WI-A06-1FB08-0918	None - ND	-	-	7
WI-AF-3FB41-0918	None - ND	-	-	·
WI-CV-3FB04-0918	None - ND	=	-	250

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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

MS/MSD samples were not analyzed.

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 results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-CV-1RW72-0918 ng/L	WI-CV-1RW72P-0918 ng/L	RPD	Qualifier
None	ND	ND	3	8

		PFCs		
Compound	WI-AF-3RW41-0918 ng/L	WI-AF-3RW41P-0918 ng/L	RPD	Qualifier
PFBS	68.0	60.0	13%	None
PFHxA	18.5	17.7	4%	
PFHpA	4.25	4.01	6%	
PFHxS	48.5	43.4	11%	
PFOA	6.13	5.69	7%	
PFOS	6.75	6.20	8%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Senior Chemist

Mancy Weaver Dated: 1/30/19

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID: W	VI-A06-RW08-0918											EPA Meth	10d 537
Client Data						L	aborato	ry Data					
Name:	CH2M Hill		Matrix:		Drinking Water	La	ab Sampl	le:	1803198-1	0	Column:	BEH C18	
Project:	NASWI CLEAN CTO-4041		Date Colle		27-Sep-18 12:40		ate Rece		02-Oct-18	09:03		BEITCIO	
Location:	DW				•								
Analyte	CAS	Number	Conc. (ng/L)	ÐL	LOD	LOC	Q Q	ualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	37	5-73-5	25.9	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFHxA	30	7-24-4	18.6	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFHpA	37	5-85-9	11.3	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFHxS	35	5-46-4	103	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFOA	33	5-67-1	31.2	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFNA	37	5-95-1	3.40	2.98	4.90	9.79		J	B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFOS	17	53-23-1	95.7	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFDA	33	5-76-2	ND	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
MeFOSAA	23	55-31-9	ND	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
EtFOSAA	29	91-50-6	ND	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFUnA	20	58-94-8	ND	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFDoA	30	7-55-1	ND	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
PFTrDA	726	29-94-8	ND	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	I
PFTeDA	37	6-06-7	ND	2.98	4.90	9.79			B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	ı
Labeled Standar	rds T	pe	% Recovery		Limits		Qı	ualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	S	URR	122		70 - 130				B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
13C2-PFDA	S	URR	97.9		70 - 130				B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1
d5-EtFOSAA	S	URR	85.8		70 - 130				B8J0026	03-Oct-18	0.255 L	05-Oct-18 13:25	1

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



Sample ID: V	WI-A06-FB08-0918										EPA Meth	hod 537
Client Data Name: CH2M Hill Project: NASWI CLEAN CTC Location: DW		41	Matrix: Drinking Water Lab San		Laboratory Data Lab Sample: 1803198-11 Date Received: 02-Oct-18 09:03			Column:	BEH C18			
Analyte	CA	AS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFHxA		307-24-4	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFHpA		375-85-9	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFHxS		355-46-4	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	
PFOA		335-67-1	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFNA		375-95-1	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	ì
PFOS	-1	1763-23-1	ND	2.92		9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFDA		335-76-2	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	Î
MeFOSAA		2355-31-9	ND	2.92		9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	92
EtFOSAA	2	2991-50-6	ND	2.92		9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	ì
PFUnA		2058-94-8	ND	2.92		9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFDoA		307-55-1	ND	2.92		9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	123
PFTrDA	7	2629-94-8	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
PFTeDA		376-06-7	ND	2.92	4.79	9.60		B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
Labeled Standa	ırds	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA		SURR	105		70 - 130			B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1
13C2-PFDA		SURR	93.6		70 - 130			B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	ı
d5-EtFOSAA		SURR	91.7		70 - 130			B8J0026	03-Oct-18	0.261 L	05-Oct-18 13:38	1

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-79935-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 28, 2018

		Metals	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW19-0818	580-79935-1	Water
1MS	WI-A06-RW19-0818MS	580-79935-1MS	Water
1MSD	WI-A06-RW19-0818MSD	580-79935-1MSD	Water
1D	WI-A06-RW19-0818	580-79935-1	Water
1DMS	WI-A06-RW19-0818MS	580-79935-1MS	Water
1DMSD	WI-A06-RW19-0818MSD	580-79935-1MSD	Water
2	WI-A06-RW19P-0818	580-79935-2	Water
2D	WI-A06-RW19P-0818	580-79935-2	Water

D - Dissolved Metals

A full data validation was performed on the analytical data for two water samples collected on August 28, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis Method References

Metals (Total Iron) USEPA SW-846 Method 6010C Metals (Dissolved) USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- · and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications
- Method blank and field QC blank contamination
- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

Overall the data is 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.

Metals (Total Iron/Dissolved Metals)

Holding Times

• All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

Not applicable.

Initial Calibration Verification

All initial calibration criteria were met.

Continuing Calibration Verification

All continuing calibration criteria were met.

Method Blank

• The method blanks were free of contamination.

Field QC Blank

Field QC samples were not collected.

ICP Interference Check Sample

• The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

• The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

• 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	Affected Samples
1	Calcium	OK/126%/OK	J	1D, 2D

Duplicate Sample Analysis

Duplicate samples were not analyzed.

ICP Serial Dilution

An ICP serial dilution was not analyzed.

Compound Quantitation

All criteria were met.

Field Duplicate Sample Precision

Field duplicate results are summarized below. The precision was acceptable.

		Total Iron		,
Compound	WI-A06-RW19-0818 mg/L	WI-A06-RW19P-0818 mg/L	RPD	Qualifier
Iron	ND	ND		

		Dissolved Metals		
Compound	WI-A06-RW19-0818	WI-A06-RW19P-0818	RPD	Qualifier
	mg/L	mg/L		
Aluminum	0.44	0.44	0%	None
Calcium	38	36	5%	
Iron	0.47	0.47	0%	
Magnesium	32	31	3%	
Manganese	0.0068	0.0068	0%	
Potassium	2.9	2.7	7%	
Silicon	15	14	7%	

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Senior Chemist

Claucy Deaver Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - TOTAL RECOVERABLE

Client Sample ID: W1-A06-RW19-0818 Lab Sample ID: 580-79935-1

Lab Name: TestAmerica Seattle Job No.: 580-79935-1

SDG ID.:

Matrix: Water Date Sampled: 08/28/2018 09:30

Reporting Basis: WET Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	Ü		1	6010C

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - TOTAL RECOVERABLE

2

Client Sample ID: W1-A06-RW19P-0818 Lab Sample ID: 580-79935-2

Lab Name: TestAmerica Seattle Job No.: 580-79935-1

SDG ID.:

Matrix: Water Date Sampled: 08/28/2018 09:30

Reporting Basis: WET Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1.	6010C

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - DISSOLVED

ID

Client Sample ID: W1-A06-RW19-0818	Lab Sample ID: 580-79935-1
Lab Name: TestAmerica Seattle	Job No.: 580-79935-1
SDG ID.:	
Matrix: Water	Date Sampled: 08/28/2018 09:30
Reporting Basis: WET	Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
/440-70-2	Calcium	38	J 1.1	0.16	mg/L		V	1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	32	1.1	0.13	mg/L		J	1	6010C
7439-96-5	Manganese	0.0068	0.020	0.0017	mg/L	U		1	6010C
7440-09-7	Potassium	2.9	3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	15	1.1	0.063	mg/L			1	6010C

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - DISSOLVED

_	_
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_	V
	-

Client Sample ID: W1-A06-RW19P-0818

Lab Sample ID: 580-79935-2

Lab Name: TestAmerica Seattle

SDG ID.:

Matrix: Water

Date Sampled: 08/28/2018 09:30

Reporting Basis: WET

Date Received: 08/29/2018 09:50

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mg/L	U		1	6010C
7440-70-2	Calcium	36	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	31	1.1	0.13	mg/L			1	6010C
7439-96-5	Manganese	0.0068	0.020	0.0017	mg/L	U		1	6010C
7440-09-7	Potassium	2.7	3.3	0.41	mg/L	J		1	6010C
7440-21-3	Silicon	14	1.1	0.063	mq/L			1	6010C

MSH



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 1802770

Laboratory: Vista Analytical Laboratory, El Dorado Hills, California Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 26, 2018

		PFCs	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
4	WI-A06-RW19-0818	1802770-04	Water
4MS	WI-A06-RW19-0818MS	1802770-04MS	Water
4MSD	WI-A06-RW19-0818MSD	1802770-04MSD	Water
5	WI-A06-RW19P-0818	1802770-05	Water
6	WI-A06-FB19-0818	1802770-06	Water
	WI-CV-IKW91-0818	1802//0-0/	Water
7MS	WI-CV-1RW91-0818MS	1802770-07MS	Water
7MSD	WI-CV-1RW91-0818MSD	1802770-07MSD	Water
8	WI-CV-1RW91P-0818	1802770-08	Water
9	WI-CV-1FB91-0818	1802770-09	Water

A full data validation was performed on the analytical data for four water samples and two aqueous field blank samples collected on August 28, 2018 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
PFCs USEPA Method 537, Revision 1.1

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Organic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Organic Superfund Methods Data Review," January 2017;
- 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 (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Perfluorinated Compounds (PFCs)

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 result are summarized in the table below.

Blank ID	Compound	Conc. ng/L	Qualifier	Affected Samples
WI-A06-FB19-0818	None - ND		*	#:
WI-CV-1FB91-0818	None - ND		-	#:

Surrogate Spike Recoveries

• All samples exhibited acceptable surrogate %R values.

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	Affected Samples
4	PFHxA	OK/OK/41.4	None	For RPD Alone
	PFHxS	OK/11.1%/136	None	4X Rule Applies

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 results are summarized below. The precision was acceptable.

		PFCs		
Compound	WI-A06-RW19-0818 ng/L	WI-A06-RW19P-0818 ng/L	RPD	Qualifier
PFBS	64.9	68.2	5%	None
PFHxA	69.2	67.3	3%	
PFHpA	37.6	36.5	3%	
PFHxS	224	242	8%	
PFOA	45.6	48.2	6%	
PFOS	73.8	80.1	8%	

		PFCs		
Compound	WI-CV-1RW91-0818 ng/L	WI-CV-1RW91P-0818 ng/L	RPD	Qualifier
None	ND	ND		5

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed:

Mancy Weaver
Senior Chemist

Dated: 10/29/18

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.



Sample ID:	WI-A06-RW19-081	8									EPA Meth	nod 537
Client Data Name: Project: Location:	CH2M Hill Navy Clean NASW RW-19	I A6/CV DW	Matrix: Date Colle	Aquected: 28-7	eous Aug-18 09:30	Lab :	Sample: Received:	1802770-0 29-Aug-18		Column:	BEH C18	
Analyte		CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	64.9	3.03	4.98	9.98	_	B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFHxA		307-24-4	69.2	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	
PFHpA		375-85-9	37.6	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFHxS		355-46-4	224	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	(4)
PFOA		335-67-1	45.6	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	7/4
PFNA		375-95-1	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	69
PFOS		1763-23-1	73.8	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	
PFDA		335-76-2	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	
MeFOSAA		2355-31-9	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	- 63
EtFOSAA		2991-50-6	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	10
PFUnA		2058-94-8	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	
PFDoA		307-55-1	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFTrDA		72629-94-8	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
PFTeDA		376-06-7	ND	3.03	4.98	9.98		B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	
Labeled Standa	ards	Туре	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA		SURR	109		70 - 130			B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	1
13C2-PFDA		SURR	99.2		70 - 130			B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	
d5-EtFOSAA		SURR	82.0		70 - 130			B8H0245	31-Aug-18	0.251 L	02-Sep-18 16:27	

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



Sample ID: W	/I-A06-RW19P-0818									EPA Meth	10d 537
Client Data Name: Project: Location:	CH2M Hill Navy Clean NASWI A6/CV DW RW-19	Matrix: Date Col	Aque lected: 28-A	eous .ug-18 09;30	Lab	oratory Data Sample: Received:	1802770-0 29-Aug-1		Column:	BEH C18	
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	68.2	2.90	4.77	9.54		B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
PFHxA	307-24-4	67.3	2.90	4.77	9,54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFHpA	375-85-9	36.5	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFHxS	355-46-4	242	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFOA	335-67-1	48.2	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFNA	375-95-1	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFOS	1763-23-1	80.1	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFDA	335-76-2	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
MeFOSAA	2355-31-9	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
EtFOSAA	2991-50-6	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFUnA	2058-94-8	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFDoA	307-55-1	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFTrDA	72629-94-8	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
PFTeDA	376-06-7	ND	2.90	4.77	9.54		B8H0245	31-Aug-18		02-Sep-18 16:40	
Labeled Standar	ds Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA	SURR	117		70 - 130			B8H0245	31-Aug-18	0.262 L	02-Sep-18 16:40	1
13C2-PFDA	SURR	91.1		70 - 130			B8H0245	31-Aug-18		02-Sep-18 16:40	
d5-EtFOSAA	SURR	81.9		70 - 130			B8H0245	31-Aug-18		02-Sep-18 16:40	

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



Sample ID:	WI-A06-FB19-0818	3									EPA Metl	hod 537
Client Data Name: CH2M Hill Project: Navy Clean NASWI A6/CV DW Location: RW-19		I A6/CV DW				Lab :	Lab Sample: 1802770-06 Date Received: 29-Aug-18 0			COMMIN. DLTI		
Analyte		CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS		375-73-5	ND	2.92	4.79	9.59		B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	1
PFHxA		307-24-4	ND	2.92	4.79	9.59		B8H0245	31-Aug-18		02-Sep-18 16:53	
PFHpA		375-85-9	ND	2.92	4.79	9.59		B8H0245			02-Sep-18 16:53	
PFHxS		355-46-4	ND	2.92	4.79	9.59		B8H0245	_		02-Sep-18 16:53	
PFOA		335-67-1	ND	2.92	4.79	9.59		B8H0245	31-Aug-18		02-Sep-18 16:53	
PFNA		375-95-1	ND	2.92	4.79	9.59		B8H0245	31-Aug-18		02-Sep-18 16:53	
PFOS		1763-23-1	ND	2.92	4.79	9.59		B8H0245	31-Aug-18		02-Sep-18 16:53	
PFDA		335-76-2	ND	2.92	4.79	9.59		B8H0245	31-Aug-18		02-Sep-18 16:53	
MeFOSAA		2355-31-9	ND	2.92	4.79	9.59		B8H0245			02-Sep-18 16:53	
EtFOSAA		2991-50-6	ND	2.92	4.79	9.59		B8H0245	31-Aug-18		02-Sep-18 16:53	
PFUnA		2058-94-8	ND	2.92	4.79	9.59		B8H0245	31-Aug-18		02-Sep-18 16:53	100
PFDoA		307-55-1	ND	2.92	4.79	9.59			31-Aug-18	0.261 L	02-Sep-18 16:53	331
PFTrDA		72629-94-8	ND	2.92	4.79	9.59			31-Aug-18		02-Sep-18 16:53	99
PFTeDA		376-06-7	ND	2.92	4.79	9.59			31-Aug-18		02-Sep-18 16:53	
Labeled Standa	ards	Type	% Recovery		Limits		Qualifiers	Batch	Extracted	Samp Size		Dilution
13C2-PFHxA		SURR	106		70 - 130			B8H0245	31-Aug-18	0,261 L	02-Sep-18 16:53	1
13C2-PFDA		SURR	87.4		70 - 130			B8H0245	31-Aug-18	0.261 L	02-Sep-18 16:53	
d5-EtFOSAA		SURR	82.0		70 - 130			B8H0245	31-Aug-18		02-Sep-18 16:53	

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



DATA VALIDATION SUMMARY REPORT NAS WHIDBEY ISLAND, WASHINGTON

Client: CH2M HILL, Inc., Corvallis, Oregon

SDG: 580-80029-1

Laboratory: Test America Laboratories, Tacoma, Washington
Site: NAS Whidbey Island, Area 6, CTO-4041, Washington

Date: October 28, 2018

		Metals	
EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	WI-A06-RW20-0818	580-80029-1	Water
1D	WI-A06-RW20-0818	580-80029-1	Water

D - Dissolved Metals

A full data validation was performed on the analytical data for one water sample collected on August 30, 2018 by CH2M HILL at the NAS Whidbey Island site in Washington. The samples were analyzed under the Environmental Protection Agency (USEPA) "Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"

Specific method references are as follows:

Analysis Method References

Metals (Total Iron) USEPA SW-846 Method 6010C Metals (Dissolved) USEPA SW-846 Method 6010C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical method and the USEPA National Functional Guidelines for Inorganic Data Review as follows:

- The USEPA "Contract Laboratories Program National Functional Guidelines for Inorganic Superfund Methods Data Review," January 2017;
- and the reviewer's professional judgment.

The following data quality indicators were reviewed for this report:

Inorganics

- Holding times and sample preservation
- Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) Tuning
- Initial and continuing calibration verifications
- Method blank and field QC blank contamination

- ICP Interference Check Sample
- Laboratory Control Sample (LCS) recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Duplicate Sample Analysis
- ICP Serial Dilution
- Compound Quantitation
- Field Duplicate sample precision

A full (Level IV) data validation was performed with this review including a recalculation of 10% of the detected results in the samples.

Data Usability Assessment

There were no rejections of data.

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

Metals (Total Iron/Dissolved Metals)

Holding Times

• All samples were prepared and analyzed within 180 days for all metals.

ICP/MS Tuning

Not applicable.

Initial Calibration Verification

• All initial calibration criteria were met.

Continuing Calibration Verification

All continuing calibration criteria were met.

Method Blank

• The method blanks were free of contamination.

Field QC Blank

Field QC samples were not collected.

ICP Interference Check Sample

The ICP interference check sample exhibited acceptable %R values.

Laboratory Control Samples/Laboratory Control Sample Duplicates (LCS/LCSD)

The LCS/LCSD samples exhibited acceptable percent recoveries (%R) and RPD values.

Matrix Spike/Matrix Spike Duplicate Analysis

MS/MSD samples were not analyzed.

Duplicate Sample Analysis

Duplicate samples were not analyzed.

ICP Serial Dilution

An ICP serial dilution was not analyzed.

Compound Quantitation

All criteria were met.

Field Duplicate Sample Precision

Field duplicate samples were not collected.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further Mancy Weaver Dated: 10/29/18 information.

Signed:

Senior Chemist

Data Qualifier	Definition
U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The analyte is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
NJ	The analysis has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the samples.
UJ	The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the samples.

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - TOTAL RECOVERABLE

Client Sample ID: WI-A06-RW20-0818

Lab Sample ID: 580-80029-1

Lab Name: TestAmerica Seattle

Job No.: 580-80029-1

SDG ID.:

Matrix: Water

Date Sampled: 08/30/2018 09:00

Reporting Basis: WET

Date Received: 09/01/2018 10:10

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7439-89-6	Iron	0.23	0.50	0.14	mg/L	J		1	6010C

1A-IN INORGANIC ANALYSIS DATA SHEET METALS - DISSOLVED

Client Sample ID: WI-A06-RW20-0818

Lab Name: TestAmerica Seattle

Job No.: 580-80029-1

SDG ID.:

Matrix: Water

Date Sampled: 08/30/2018 09:00

Reporting Basis: WET

Date Received: 09/01/2018 10:10

CAS No.	Analyte	Result	LOQ	DL	Units	С	Q	DIL	Method
7429-90-5	Aluminum	0.44	1.5	0.11	mq/L	10		1	6010C
7440-70-2	Calcium	46	1.1	0.16	mg/L			1	6010C
7439-89-6	Iron	0.47	0.50	0.14	mg/L	U		1	6010C
7439-95-4	Magnesium	42	1.1	0.13	mg/L			1	6010C
7439-96-5	Manganese	0.075	0.020	0.0017	mg/L			1	6010C
7440-09-7	Potassium	3.7	3.3	0.41	mg/L			1	6010C
7440-21-3	Silicon	14	1.1	0.063	mq/L			1	6010C