

ANALYTICAL RESULTS

Sample ID: Method Blank						PFAS Isotope Dilution Method					
Client Data Name: SKOOKUM Contract Services Project: PFC Monthly Sites, FY19 Dec						Laboratory Data Lab Sample: B8L0181-BLK1 Column: BEH C18					
Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFHxA	307-24-4	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFHpA	375-85-9	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFHxS	355-46-4	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFOA	335-67-1	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFNA	375-95-1	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFOS	1763-23-1	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFDA	335-76-2	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
MeFOSAA	2355-31-9	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
EtFOSAA	2991-50-6	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFUnA	2058-94-8	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFDaA	307-55-1	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFTeDA	72629-94-8	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
PFTeDA	376-06-7	ND	2.74	4.00	8.00		B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers		Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	101	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C2-PFHxA	IS	92.2	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C4-PFHpA	IS	95.0	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
18O2-PFHxS	IS	98.6	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C2-PFOA	IS	89.5	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C5-PFNA	IS	84.7	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C8-PFOS	IS	99.1	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C2-PFDA	IS	80.5	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
d3-MeFOSAA	IS	89.9	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
d5-EtFOSAA	IS	85.5	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C2-PFUnA	IS	75.0	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C2-PFDaA	IS	76.2	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1
13C2-PFTeDA	IS	87.2	50 - 150				B8L0181	27-Dec-18	0.125 L	30-Dec-18 01:11	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

Sample ID: LCSD

PFAS Isotope Dilution Method

Name:	SKOOKUM Contract Services	Lab Sample:	B8L0181-BS1/B8L0181-BSD1	Date Extracted:	27-Dec-18
Project:	PFC Monthly Sites, FY19 Dec	QC Batch:	B8L0181	Column:	BEH C18
Matrix:	Aqueous	Samp Size:	0.125/0.125 L		

Analyte	CAS Number	LCS (ng/L)	LCS Spike Amt	LCS % Rec	LCS Quals	LCSD (ng/L)	LCSD Spike Amt	LCSD % Rec	RPD	LCSD Quals	%Rec Limits	RPD Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
PFBS	375-73-5	79.6	80.0	99.5		76.7	80.0	95.8	3.81		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFHxA	307-24-4	79.5	80.0	99.4		75.9	80.0	94.9	4.70		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFHpA	375-85-9	75.4	80.0	94.2		74.2	80.0	92.8	1.57		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFHxS	355-46-4	74.1	80.0	92.7		79.6	80.0	99.5	7.08		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFOA	335-67-1	82.2	80.0	103		77.1	80.0	96.4	6.40		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFNA	375-95-1	79.4	80.0	99.3		73.6	80.0	92.0	7.62		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFOS	1763-23-1	79.7	80.0	99.7		75.2	80.0	94.0	5.84		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFDA	335-76-2	78.3	80.0	97.9		78.6	80.0	98.2	0.310		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
MeFOSAA	2355-31-9	70.8	80.0	88.5		76.3	80.0	95.4	7.47		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
EtFOSAA	2991-50-6	74.7	80.0	93.4		74.2	80.0	92.8	0.679		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFUnA	2058-94-8	81.5	80.0	102		81.9	80.0	102	0.465		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFDoA	307-55-1	85.6	80.0	107		86.5	80.0	108	0.982		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFTTrDA	72629-94-8	86.7	80.0	108		89.0	80.0	111	2.63		60-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1
PFTeDA	376-06-7	83.6	80.0	104		82.1	80.0	103	1.80		70-130	30	30-Dec-18 00:50	1	30-Dec-18 01:01	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	100		103		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C2-PFHxA	IS	95.7		98.7		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C4-PFHpA	IS	99.0		101		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
18O2-PFHxS	IS	101		101		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C2-PFOA	IS	92.1		95.3		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C5-PFNA	IS	85.2		90.8		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C8-PFOS	IS	93.8		93.8		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C2-PFDA	IS	82.2		83.7		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
d3-MeFOSAA	IS	89.1		90.6		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
d5-EtFOSAA	IS	88.1		89.0		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C2-PFUnA	IS	80.1		76.9		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C2-PFDoA	IS	85.6		76.9		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1
13C2-PFTeDA	IS	94.6		90.6		50-150	30-Dec-18 00:50	1	30-Dec-18 01:01	1

Sample ID: PFC-AF-01-03-121918	PFAS Isotope Dilution Method
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Client Data Name: SKOOKUM Contract Services Project: PFC Monthly Sites, FY19 Dec Location: E Property, Map Grid E13	Laboratory Data Lab Sample: 1804146-03 Date Received: 20-Dec-18 10:12 Column: BEH C18
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Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	10.5	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFHxA	307-24-4	19.0	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFHpA	375-85-9	8.28	3.09	4.50	9.03	J	B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFHxS	355-46-4	57.0	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFOA	335-67-1	22.4	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFNA	375-95-1	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFOS	1763-23-1	68.1	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFDA	335-76-2	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
MeFOSAA	2355-31-9	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
EtFOSAA	2991-50-6	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFOA	2058-94-8	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFDoA	307-55-1	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFTeDA	72629-94-8	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
PFTeDA	376-06-7	ND	3.09	4.50	9.03		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	92.9	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C2-PFHxA	IS	87.6	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C4-PFHxA	IS	92.7	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
18O2-PFHxS	IS	97.0	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C2-PFOA	IS	91.3	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C5-PFNA	IS	76.2	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C8-PFOS	IS	90.6	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C2-PFDA	IS	78.0	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
d3-MeFOSAA	IS	93.8	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
d5-EtFOSAA	IS	96.9	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C2-PFUnA	IS	77.2	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C2-PFDoA	IS	81.1	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1
13C2-PFTeDA	IS	98.0	50 - 150		B8L0181	27-Dec-18	0.111 L	30-Dec-18 01:43	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
D	Dilution
DL	Detection limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limits of Detection
LOQ	Limits of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
NA	Not applicable
ND	Not Detected
Q	Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

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

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	18-008-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-009
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-18-9
Virginia Department of General Services	9618
Washington Department of Ecology	C584-18
Wisconsin Department of Natural Resources	998036160

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

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

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

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

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

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