

ANALYTICAL RESULTS

Sample ID: Method Blank	PFAS Isotope Dilution Method
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Client Data Name: SKOOKUM Contract Services Project: PFC Monthly Sites, FY19 Dec	Laboratory Data Matrix: Aqueous Lab Sample: B9A0086-BLK1 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	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFHxA	307-24-4	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFHpA	375-85-9	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFHxS	355-46-4	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFOA	335-67-1	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFNA	375-95-1	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFOS	1763-23-1	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFDA	335-76-2	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
MeFOSAA	2355-31-9	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
EtFOSAA	2991-50-6	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFUnA	2058-94-8	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFDaA	307-55-1	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFTDA	72629-94-8	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
PFTeDA	376-06-7	ND	2.74	4.00	8.00		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.2	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C2-PFHxA	IS	98.5	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C4-PFHpA	IS	92.7	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
18O2-PFHxS	IS	91.9	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C2-PFOA	IS	84.3	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C5-PFNA	IS	80.4	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C8-PFOS	IS	83.1	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C2-PFDA	IS	70.5	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
d3-MeFOSAA	IS	82.6	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
d5-EtFOSAA	IS	78.4	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C2-PFUnA	IS	74.2	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C2-PFDaA	IS	63.4	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1
13C2-PFTeDA	IS	68.2	50 - 150		B9A0086	11-Jan-19	0.125 L	14-Jan-19 22:59	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

Sample ID: LCSD

PFAS Isotope Dilution Method

Name:	SKOOKUM Contract Services	Lab Sample:	B9A0086-BS1/B9A0086-BSD1	Date Extracted:	11-Jan-19
Project:	PFC Monthly Sites, FY19 Dec	QC Batch:	B9A0086	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	81.6	80.0	102		78.4	80.0	98.0	4.10		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFHxA	307-24-4	81.9	80.0	102		81.2	80.0	101	0.887		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFHpA	375-85-9	76.0	80.0	95.0		81.7	80.0	102	7.21		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFHxS	355-46-4	74.4	80.0	93.0		72.7	80.0	90.9	2.31		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFOA	335-67-1	73.9	80.0	92.4		80.3	80.0	100	8.34		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFNA	375-95-1	82.5	80.0	103		77.1	80.0	96.4	6.67		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFOS	1763-23-1	81.8	80.0	102		66.8	80.0	83.5	20.3		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFDA	335-76-2	71.7	80.0	89.7		68.7	80.0	85.9	4.36		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
MeFOSAA	2355-31-9	78.0	80.0	97.5		74.2	80.0	92.8	4.98		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
EtFOSAA	2991-50-6	74.5	80.0	93.1		78.9	80.0	98.6	5.72		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFUnA	2058-94-8	83.9	80.0	105		83.9	80.0	105	0.0129		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFDoA	307-55-1	85.6	80.0	107		76.8	80.0	96.0	10.8		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFTTrDA	72629-94-8	76.9	80.0	96.1		71.2	80.0	89.0	7.69		60-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1
PFTeDA	376-06-7	82.5	80.0	103		80.3	80.0	100	2.66		70-130	30	14-Jan-19 22:38	1	14-Jan-19 22:48	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	97.8		103		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C2-PFHxA	IS	95.8		96.4		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C4-PFHpA	IS	101		96.5		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
18O2-PFHxS	IS	98.1		97.6		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C2-PFOA	IS	87.9		87.9		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C5-PFNA	IS	85.2		75.9		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C8-PFOS	IS	86.7		86.3		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C2-PFDA	IS	81.9		78.8		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
d3-MeFOSAA	IS	79.0		84.7		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
d5-EtFOSAA	IS	87.4		90.5		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C2-PFUnA	IS	73.4		74.2		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C2-PFDoA	IS	68.0		70.4		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1
13C2-PFTeDA	IS	58.8		61.8		50-150	14-Jan-19 22:38	1	14-Jan-19 22:48	1

Sample ID: PFC-AF-01-03-010819	PFAS Isotope Dilution Method
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Client Data	Laboratory Data
Name: SKOOKUM Contract Services	Lab Sample: 1900091-03
Project: PFC Monthly Sites, FY19 Dec	Column: BEH C18
Location: E Property, Map Grid E13	Date Received: 10-Jan-19 10:47
Matrix: Aqueous	Date Collected: 08-Jan-19 09:00

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	13.8	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFHxA	307-24-4	25.1	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFHpA	375-85-9	9.78	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFHxS	355-46-4	79.4	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFOA	335-67-1	31.2	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFNA	375-95-1	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFOS	1763-23-1	81.9	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFDA	335-76-2	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
MeFOSAA	2355-31-9	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
EtFOSAA	2991-50-6	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFUnA	2058-94-8	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFDaA	307-55-1	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFTeDA	72629-94-8	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
PFTeDA	376-06-7	ND	3.02	4.42	8.82		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	98.6	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C2-PFHxA	IS	98.9	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C4-PFHpA	IS	100	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
18O2-PFHxS	IS	97.4	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C2-PFOA	IS	95.6	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C5-PFNA	IS	91.9	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C8-PFOS	IS	96.0	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C2-PFDA	IS	87.2	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
d3-MeFOSAA	IS	87.7	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
d5-EtFOSAA	IS	94.2	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C2-PFUnA	IS	80.9	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C2-PFDaA	IS	72.3	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	1
13C2-PFTeDA	IS	81.4	50 - 150		B9A0086	11-Jan-19	0.113 L	14-Jan-19 23:31	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
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
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