

ANALYTICAL RESULTS

Sample ID: Method Blank						PFAS Isotope Dilution Method					
Client Data Name: SKOOKUM Contract Services Project: PFC Monthly Sampling Part A, FY19 Apr						Laboratory Data Lab Sample: B9D0164-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		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFHxA	307-24-4	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFHpA	375-85-9	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFHxS	355-46-4	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFOA	335-67-1	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFNA	375-95-1	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFOS	1763-23-1	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFDA	335-76-2	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
MeFOSAA	2355-31-9	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
EtFOSAA	2991-50-6	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFA	2058-94-8	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFDoA	307-55-1	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFTDA	72629-94-8	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
PFTeDA	376-06-7	ND	2.74	4.00	8.00		B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
Labeled Standards	Type	% Recovery	Limits		Qualifiers		Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	99.0	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C2-PFHxA	IS	95.9	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C4-PFHpA	IS	93.0	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C3-PFHxS	IS	96.2	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C2-PFOA	IS	84.0	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C5-PFNA	IS	80.5	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C8-PFOS	IS	85.0	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C2-PFDA	IS	78.6	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
d3-MeFOSAA	IS	73.7	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
d5-EtFOSAA	IS	82.5	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C2-PFA	IS	69.9	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C2-PFDoA	IS	67.9	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1
13C2-PFTeDA	IS	60.7	50 - 150				B9D0164	19-Apr-19	0.125 L	22-Apr-19 21:50	1

DL - Detection Limit

 LOD - Limit of Detection
 LOQ - Limit of quantitation

Results reported to the DL.

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

Sample ID: LCSD

PFAS Isotope Dilution Method

Name:	SKOOKUM Contract Services	Lab Sample:	B9D0164-BS1/B9D0164-BSD1	Date Extracted:	19-Apr-19
Project:	PFC Monthly Sampling Part A, FY19 Apr	QC Batch:	B9D0164	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	75.5	80.0	94.4		73.0	80.0	91.3	3.39		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFHxA	307-24-4	82.1	80.0	103		83.9	80.0	105	2.16		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFHpA	375-85-9	76.2	80.0	95.3		74.7	80.0	93.4	2.04		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFHxS	355-46-4	73.6	80.0	92.0		80.3	80.0	100	8.75		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFOA	335-67-1	81.9	80.0	102		79.6	80.0	99.5	2.86		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFNA	375-95-1	75.9	80.0	94.8		75.4	80.0	94.3	0.582		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFOS	1763-23-1	75.8	80.0	94.8		75.1	80.0	93.9	0.949		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFDA	335-76-2	77.5	80.0	96.9		81.4	80.0	102	4.89		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
MeFOSAA	2355-31-9	79.7	80.0	99.6		78.7	80.0	98.3	1.28		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
EtFOSAA	2991-50-6	77.1	80.0	96.4		73.1	80.0	91.4	5.32		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFUnA	2058-94-8	82.4	80.0	103		84.1	80.0	105	1.98		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFDoA	307-55-1	82.1	80.0	103		80.1	80.0	100	2.54		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFTTrDA	72629-94-8	76.2	80.0	95.3		74.0	80.0	92.5	2.95		60-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1
PFTeDA	376-06-7	83.3	80.0	104		81.2	80.0	101	2.56		70-130	30	22-Apr-19 21:29	1	22-Apr-19 21:39	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	98.8		97.7		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C2-PFHxA	IS	94.8		92.7		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C4-PFHpA	IS	96.0		89.8		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C3-PFHxS	IS	97.7		91.9		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C2-PFOA	IS	83.8		85.8		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C5-PFNA	IS	78.6		80.2		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C8-PFOS	IS	75.9		85.1		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C2-PFDA	IS	75.4		76.2		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
d3-MeFOSAA	IS	72.9		74.9		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
d5-EtFOSAA	IS	78.6		85.7		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C2-PFUnA	IS	67.2		68.7		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C2-PFDoA	IS	62.7		62.2		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1
13C2-PFTeDA	IS	58.9		56.3		50-150	22-Apr-19 21:29	1	22-Apr-19 21:39	1

Sample ID: PFC-AF-01-03-041219
PFAS Isotope Dilution Method

Client Data				Laboratory Data			
Name:	SKOOKUM Contract Services	Matrix:	Aqueous	Lab Sample:	1900780-03	Column:	BEH C18
Project:	PFC Monthly Sampling Part A, FY19 Apr	Date Collected:	12-Apr-19 10:55	Date Received:	18-Apr-19 09:41		
Location:	E Property, Map Grid E13						

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	7.72	3.03	4.42	8.86	J	B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFHxA	307-24-4	21.1	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFHpA	375-85-9	7.81	3.03	4.42	8.86	J, Q	B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFHxS	355-46-4	52.3	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFOA	335-67-1	25.1	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFNA	375-95-1	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFOS	1763-23-1	60.9	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFDA	335-76-2	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
MeFOSAA	2355-31-9	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
EtFOSAA	2991-50-6	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFUnA	2058-94-8	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFDaA	307-55-1	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFTeDA	72629-94-8	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
PFTeDA	376-06-7	ND	3.03	4.42	8.86		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	93.5	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C2-PFHxA	IS	90.8	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C4-PFHxA	IS	90.1	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C3-PFHxS	IS	90.0	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C2-PFOA	IS	82.0	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C5-PFNA	IS	80.4	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C8-PFOS	IS	88.9	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C2-PFDA	IS	74.9	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
d3-MeFOSAA	IS	76.6	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
d5-EtFOSAA	IS	78.2	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C2-PFUnA	IS	72.5	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C2-PFDaA	IS	73.5	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1
13C2-PFTeDA	IS	81.4	50 - 150		B9D0164	19-Apr-19	0.113 L	22-Apr-19 22:22	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

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	The ion transition ratio is outside of the acceptance criteria.
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	19-013-0
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	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
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