ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: SKOOKUM Contract Services
Project: PFC Monthly Sites, Part A, FY19 Feb

Matrix: Aqueous

Laboratory Data

Lab Sample: B9C0010-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		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFHxA	307-24-4	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFHpA	375-85-9	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFHxS	355-46-4	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFOA	335-67-1	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFNA	375-95-1	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFOS	1763-23-1	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFDA	335-76-2	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
MeFOSAA	2355-31-9	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
EtFOSAA	2991-50-6	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFUnA	2058-94-8	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFDoA	307-55-1	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFTrDA	72629-94-8	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
PFTeDA	376-06-7	ND	2.74	4.00	8.00		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	107	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C2-PFHxA	IS	110	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C4-PFHpA	IS	120	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
18O2-PFHxS	IS	102	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C2-PFOA	IS	110	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C5-PFNA	IS	85.9	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C8-PFOS	IS	78.7	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C2-PFDA	IS	92.7	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
d3-MeFOSAA	IS	90.2	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
d5-EtFOSAA	IS	89.0	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C2-PFUnA	IS	85.6	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C2-PFDoA	IS	64.8	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1
13C2-PFTeDA	IS	77.9	50 - 150		B9C0010	04-Mar-19	0.125 L	05-Mar-19 18:18	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

Sample ID: LCSD **PFAS Isotope Dilution Method**

Name:	SKOOKUM Contract Services	Lab Sample:	B9C0010-BS1/B9C0010-BSD1		
Project:	PFC Monthly Sites, Part A, FY19 Feb	QC Batch:	B9C0010	Date Extracted:	04-Mar-19
Matrix:	Aqueous	Samp Size:	0.125/0.125 L	Column:	BEH C18

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	79.5	80.0	99.4		79.5	80.0	99.4	0.0388		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFHxA	307-24-4	71.7	80.0	89.6		66.0	80.0	82.5	8.26		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFHpA	375-85-9	78.0	80.0	97.5		80.6	80.0	101	3.30		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFHxS	355-46-4	71.8	80.0	89.8		71.2	80.0	89.0	0.874		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFOA	335-67-1	60.8	80.0	76.0		61.5	80.0	76.8	1.15		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFNA	375-95-1	88.9	80.0	111		86.0	80.0	108	3.29		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFOS	1763-23-1	74.5	80.0	93.1		67.1	80.0	83.9	10.3		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFDA	335-76-2	66.3	80.0	82.9		64.4	80.0	80.5	2.99		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
MeFOSAA	2355-31-9	71.8	80.0	89.7		63.2	80.0	79.0	12.7		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
EtFOSAA	2991-50-6	66.9	80.0	83.7		62.4	80.0	78.0	6.98		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFUnA	2058-94-8	80.7	80.0	101		84.1	80.0	105	4.11		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFDoA	307-55-1	76.9	80.0	96.2		81.5	80.0	102	5.83		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFTrDA	72629-94-8	75.1	80.0	93.9		67.7	80.0	84.6	10.4		60-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1
PFTeDA	376-06-7	72.1	80.0	90.1		67.9	80.0	84.9	5.97		70-130	30	05-Mar-19 17:56	1	05-Mar-19 18:07	1

Labeled Standards	Type	LCS % Rec	LCS Quals	LCSD % Rec	LCSD Quals	Limits	LCS Analyzed	LCS Dil	LCSD Analyzed	LCSD Dil
13C3-PFBS	IS	103		105		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C2-PFHxA	IS	107		112		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C4-PFHpA	IS	123		120		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
18O2-PFHxS	IS	105		100		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C2-PFOA	IS	109		107		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C5-PFNA	IS	80.0		86.3		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C8-PFOS	IS	72.6		87.6		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C2-PFDA	IS	80.8		94.4		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
d3-MeFOSAA	IS	74.3		90.9		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
d5-EtFOSAA	IS	75.7		89.2		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C2-PFUnA	IS	71.6		85.1		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C2-PFDoA	IS	47.0	H	65.8		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1
13C2-PFTeDA	IS	65.0		73.9		50-150	05-Mar-19 17:56	1	05-Mar-19 18:07	1

Sample ID: PFC-AF-M-03-022619

PFAS Isotope Dilution Method

Client Data

Name: SKOOKUM Contract Services
Project: PFC Monthly Sites, Part A, FY19 Feb
Location: E Property, Map Grid E13

Matrix: Aqueous
Date Collected: 26-Feb-19 12:50

Laboratory Data

Lab Sample: 1900381-03
Date Received: 01-Mar-19 11:19

Column: BEH C18

Analyte	CAS Number	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	14.5	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFHxA	307-24-4	23.6	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFHpA	375-85-9	11.4	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFHxS	355-46-4	90.8	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFOA	335-67-1	30.9	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFNA	375-95-1	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFOS	1763-23-1	95.5	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFDA	335-76-2	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
MeFOSAA	2355-31-9	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
EtFOSAA	2991-50-6	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFUnA	2058-94-8	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFDoA	307-55-1	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFTrDA	72629-94-8	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
PFTeDA	376-06-7	ND	3.06	4.46	8.93		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBS	IS	103	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C2-PFHxA	IS	106	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C4-PFHpA	IS	120	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
18O2-PFHxS	IS	93.2	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C2-PFOA	IS	112	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C5-PFNA	IS	82.5	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C8-PFOS	IS	87.5	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C2-PFDA	IS	95.4	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
d3-MeFOSAA	IS	89.9	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
d5-EtFOSAA	IS	90.3	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C2-PFUnA	IS	85.1	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C2-PFDoA	IS	67.7	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1
13C2-PFTeDA	IS	94.4	50 - 150		B9C0010	04-Mar-19	0.112 L	05-Mar-19 18:49	1

DL - Detection Limit

LOD - Limit of Detection
LOQ - Limit of quantitation

Results reported to the DL.

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

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