

July 7, 2021

Marcus Zimmerman and Sammy Cummings  
DOT&PF Southcoast Region  
P.O. Box 196900  
Anchorage, AK 99519

RE: YAKUTAT TRENCH DRAIN CULVERT SOIL SAMPLE COLLECTION LETTER REPORT

Shannon & Wilson has prepared this letter report to document our soil sample collection efforts at the Yakutat Airport (YAK) in Yakutat, Alaska. This letter briefly addresses field activities conducted by Shannon & Wilson (S&W), and analytical results compared to applicable regulatory levels. These services were conducted on behalf of the Alaska Department of Transportation & Public Facilities (DOT&PF), under Notice to Proceed P7-4-2021 and in accordance with DOT&PF's Professional Services Agreement Number 25-19-1-013 *Per- and Polyfluoroalkyl Substance (PFAS) Related Environmental & Engineering Services*.

## BACKGROUND

The YAK is an active, DEC listed contaminated site due to the presence of PFAS in water supply well samples (DEC File Number 1530.38.022, Hazard ID 27090). DOT&PF requested S&W collect PFAS samples of other media (e.g. surface water, surface soil, etc.) at the YAK during routine monitoring events when there is available budget (i.e. when we are not able to sample each of the planned water supply well locations). The purpose of collecting these samples is to help guide planning for future construction projects at the YAK with respect to PFAS.

## FIELD ACTIVITIES

In May 2021 S&W chemist, Michael Jaramillo, traveled to Yakutat to perform the fiscal year (FY) 2021 routine annual/quarterly PFAS monitoring event at the YAK. During the monitoring event Mr. Jaramillo collected one soil sample from the ground surface within one foot of the discharge points at the north and south ends of the culvert which drain the YAK apron via a trench drain (Figure 1, enclosed). Soil samples were collected following the procedures outlined in the *DOT&PF Statewide PFAS General Work Plan (GWP)*, approved by DEC in August 2020.

Mr. Jaramillo is a State of Alaska Qualified Sampler per 18 AAC 75.333[b] and 18 AAC 78.088[b].

## ANALYTICAL RESULTS

Analytical samples collected for this project were submitted to Eurofins TestAmerica Laboratories, Inc. (TestAmerica) in West Sacramento, California, for determination of 18 PFAS. The laboratory maintains current certifications approved by DEC Contaminated Sites to conduct the requested analyses.

Perfluoroundecanoic acid (PFUnA) was detected at an estimated concentration below the laboratory reporting limit at 0.058 J micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) in sample 21YAK-SS-01. No other PFAS analytes were detected in the drainage ditch samples. PFAS analytical results are enclosed in Table 1.

S&W reviewed the analytical data following the procedures detailed in our Data Validation Program Plan (DVPP) which is included in the GWP. The quality of the analytical data for this project does not appear to have been compromised. By working in accordance with our proposed scope of services, we consider the samples we collected to be representative of site conditions at the locations and times they were obtained. The analytical laboratory report and corresponding DEC Laboratory Data Review Checklist (LDRC) are also enclosed.

## COMPARISON TO REGULATORY LIMITS AND DISCUSSION

Soil results were compared to Alaska's 18 AAC 75.341 *Tables B1 Method Two – Migration to Groundwater and B2, Method Two – Under 40-Inch Zone Migration to Groundwater*. PFOS and PFOA were not detected in either surface soil sample. PFUnA was observed at an estimated concentration in project sample 21YAK-SS-01.

We appreciate the opportunity to support you with this project. If you have questions, please contact me at 907-458-3118.

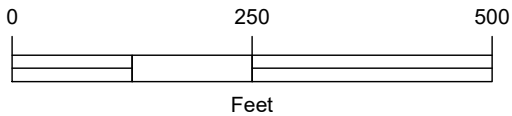
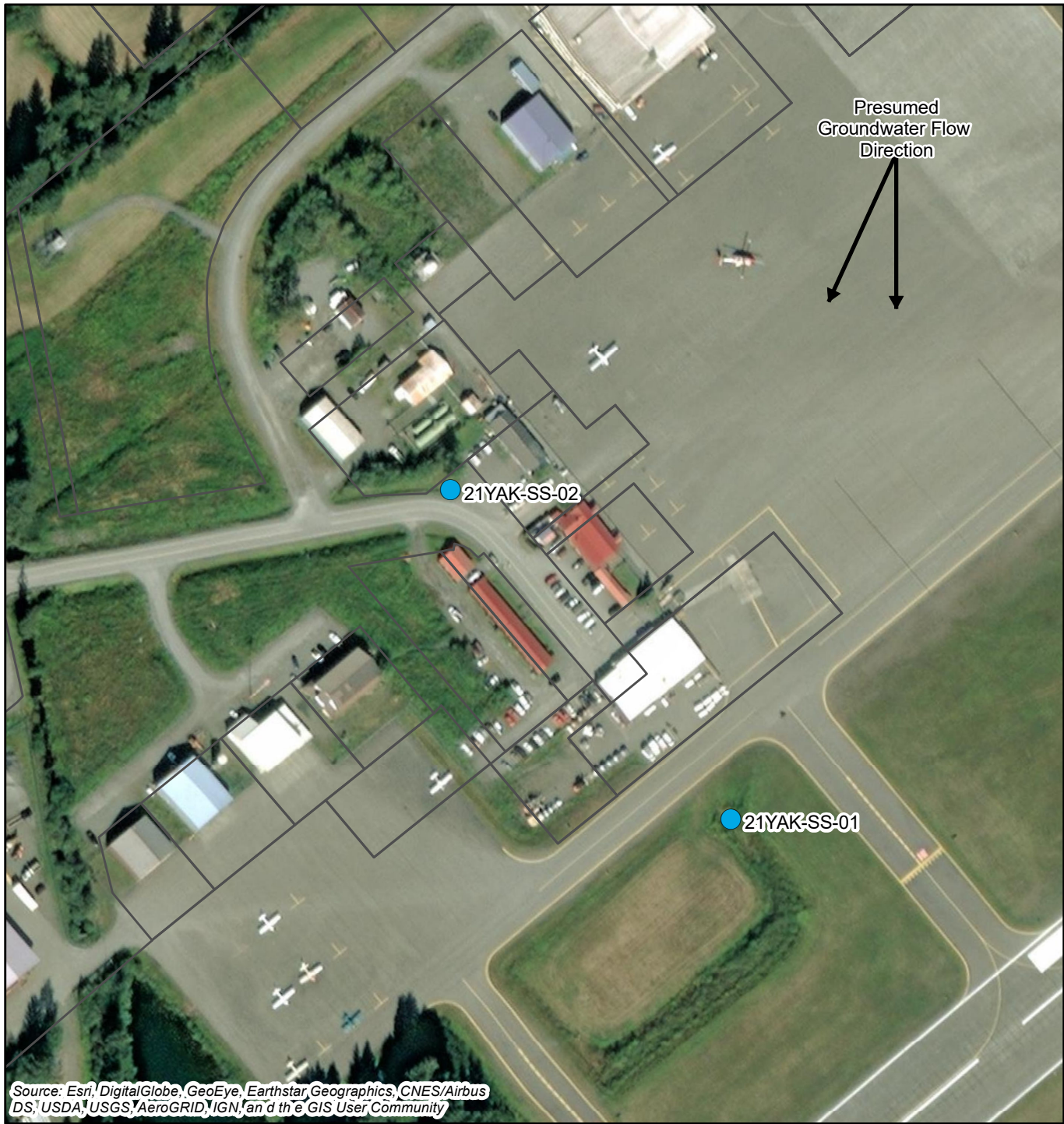
Sincerely,

SHANNON & WILSON

Ashley Jaramillo  
Senior Chemist/Project Manager

AMJ:KRF:CBD/amj

Enc. Figure 1 - May 2021 Soil Samples  
Table 1. Summary of May 2021 Soil Analytical Results  
TestAmerica Lab Report 320-73902-1 Revision 1  
Laboratory Data Review Checklist 320-73902-1 Revision 1



**LEGEND**

- Soil Sample
- Yakutat Tax Parcels



Yakutat Airport Trench Drain Culvert Soil Collection Yakutat, Alaska	
<b>MAY 2021          SOIL SAMPLES</b>	
June 2021	102896-006
<b>SHANNON &amp; WILSON, INC.</b> <small>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS</small>	
<b>Figure 1</b>	

**Table 1 - Summary of May 2021 Soil Analytical Results - Yakutat**

Analyte	Cleanup Level†	Sample ID	21YAK-SS-01	21YAK-SS-02
		Units	05/16/2021	05/16/2021
Perfluorohexanesulfonic acid (PFHxS)	-	ug/Kg	<0.24	<0.26
Perfluorohexanoic acid (PFHxA)	-	ug/Kg	<0.24	<0.26
Perfluoroheptanoic acid (PFHpA)	-	ug/Kg	<0.24	<0.26
Perfluorononanoic acid (PFNA)	-	ug/Kg	<0.24	<0.26
Perfluorobutanesulfonic acid (PFBS)	-	ug/Kg	<0.24	<0.26
Perfluorodecanoic acid (PFDA)	-	ug/Kg	<0.24	<0.26
Perfluoroundecanoic acid (PFUnA)	-	ug/Kg	0.058 J	<0.26
Perfluorododecanoic acid (PFDoA)	-	ug/Kg	<0.24	<0.26
Perfluorotridecanoic acid (PFTrDA)	-	ug/Kg	<0.24	<0.26
Perfluorotetradecanoic acid (PFTeA)	-	ug/Kg	<0.24	<0.26
N-Methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	-	ug/Kg	<2.4	<2.6
N-Ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	-	ug/Kg	<2.4	<2.6
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	-	ug/Kg	<0.24	<0.26
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	-	ug/Kg	<0.24	<0.26
4,8-Dioxa-3H-perfluorononanoic acid (DONA)	-	ug/Kg	<0.24	<0.26
Hexafluoropropylene oxide dimer acid (HFPO-DA)	-	ug/Kg	<0.30	<0.33
Perfluorooctanesulfonic acid (PFOS)	3.0	ug/Kg	<0.60	<0.66
Perfluorooctanoic acid (PFOA)	1.7	ug/Kg	<0.24	<0.26

**Notes:**

Results reported from Eurofins/TestAmerica, Inc. work order 320-73902-1 Revision 1.

† DEC Cleanup Levels from 18 AAC 75.341 Table B1 Method Two - Soil Cleanup Levels Table (Migration to Groundwater).

&lt; Analyte not detected; listed as less than the reporting limit (RL) unless otherwise flagged due to quality-control (QC) failures.

— No applicable ADEC cleanup level exists for the associated analyte.

J Estimated concentration, detected greater than the MDL and less than the RL. Flag applied by the laboratory.

ug/kg = micrograms per kilogram

## ANALYTICAL REPORT

Eurofins TestAmerica, Sacramento  
880 Riverside Parkway  
West Sacramento, CA 95605  
Tel: (916)373-5600

Laboratory Job ID: 320-73902-1  
Client Project/Site: YAK - May 2021 Soil  
Revision: 1

For:  
Shannon & Wilson, Inc  
2355 Hill Rd.  
Fairbanks, Alaska 99709-5244

Attn: Ashley Jaramillo



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Authorized for release by:  
6/3/2021 8:12:40 AM

David Alltucker, Project Manager I  
(916)374-4383  
[David.Alltucker@Eurofinset.com](mailto:David.Alltucker@Eurofinset.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:

[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Definitions/Glossary

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

## Qualifiers

### LCMS

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count



# Case Narrative

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

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## Job ID: 320-73902-1

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### Laboratory: Eurofins TestAmerica, Sacramento

#### Narrative

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#### Job Narrative 320-73902-1

Revision 6-3-2021: This report has been revised to remove batch QC NCMs as non-client sample QC is not being reported.

#### Receipt

The samples were received on 5/19/2021 3:22 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.5° C.

#### LCMS

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Organic Prep

Method SHAKE: The following samples were yellow after final volume/extraction: 21YAK-SS-01 (320-73902-1) and 21YAK-SS-02 (320-73902-2).  
preparation batch 320-491259

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

**Client Sample ID: 21YAK-SS-01**

**Lab Sample ID: 320-73902-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Perfluoroundecanoic acid (PFUnA)	0.058	J	0.24	0.043	ug/Kg	1	*	EPA 537(Mod)	Total/NA

**Client Sample ID: 21YAK-SS-02**

**Lab Sample ID: 320-73902-2**

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Sacramento



# Client Sample Results

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

**Client Sample ID: 21YAK-SS-01**

**Lab Sample ID: 320-73902-1**

Date Collected: 05/16/21 10:39

Matrix: Solid

Date Received: 05/19/21 15:22

Percent Solids: 78.0

**Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.24	0.051	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluoroheptanoic acid (PFHpA)	ND		0.24	0.035	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorooctanoic acid (PFOA)	ND		0.24	0.10	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorononanoic acid (PFNA)	ND		0.24	0.043	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorodecanoic acid (PFDA)	ND		0.24	0.027	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
<b>Perfluoroundecanoic acid (PFUnA)</b>	<b>0.058</b>	<b>J</b>	0.24	0.043	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorododecanoic acid (PFDoA)	ND		0.24	0.081	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorotridecanoic acid (PFTriA)	ND		0.24	0.062	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.24	0.065	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.24	0.030	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.24	0.037	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.60	0.24	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.4	0.47	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.4	0.45	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.24	0.033	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.30	0.13	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.24	0.027	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.24	0.022	ug/Kg	☼	05/20/21 20:05	05/23/21 01:17	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	79		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C4 PFHpA	71		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C4 PFOA	76		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C5 PFNA	72		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C2 PFDA	72		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C2 PFUnA	79		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C2 PFDoA	74		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C2 PFTeDA	68		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C3 PFBS	69		50 - 150	05/20/21 20:05	05/23/21 01:17	1
18O2 PFHxS	74		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C4 PFOS	69		50 - 150	05/20/21 20:05	05/23/21 01:17	1
d3-NMeFOSAA	71		50 - 150	05/20/21 20:05	05/23/21 01:17	1
d5-NEtFOSAA	74		50 - 150	05/20/21 20:05	05/23/21 01:17	1
13C3 HFPO-DA	67		50 - 150	05/20/21 20:05	05/23/21 01:17	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Percent Moisture</b>	<b>22.0</b>		0.1	0.1	%			05/21/21 12:41	1
<b>Percent Solids</b>	<b>78.0</b>		0.1	0.1	%			05/21/21 12:41	1

Eurofins TestAmerica, Sacramento

# Client Sample Results

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

**Client Sample ID: 21YAK-SS-02**

**Lab Sample ID: 320-73902-2**

Date Collected: 05/16/21 10:57

Matrix: Solid

Date Received: 05/19/21 15:22

Percent Solids: 71.3

**Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Perfluorohexanoic acid (PFHxA)	ND		0.26	0.055	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluoroheptanoic acid (PFHpA)	ND		0.26	0.038	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorooctanoic acid (PFOA)	ND		0.26	0.11	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorononanoic acid (PFNA)	ND		0.26	0.047	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorodecanoic acid (PFDA)	ND		0.26	0.029	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluoroundecanoic acid (PFUnA)	ND		0.26	0.047	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorododecanoic acid (PFDoA)	ND		0.26	0.088	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorotridecanoic acid (PFTriA)	ND		0.26	0.067	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.26	0.071	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.26	0.033	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.26	0.041	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.66	0.26	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.6	0.51	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.6	0.49	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.26	0.036	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.33	0.14	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.26	0.029	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.26	0.024	ug/Kg	✱	05/20/21 20:05	05/23/21 01:26	1

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
13C2 PFHxA	83		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C4 PFHpA	77		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C4 PFOA	75		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C5 PFNA	69		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C2 PFDA	69		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C2 PFUnA	74		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C2 PFDoA	68		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C2 PFTeDA	71		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C3 PFBS	71		50 - 150	05/20/21 20:05	05/23/21 01:26	1
18O2 PFHxS	73		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C4 PFOS	64		50 - 150	05/20/21 20:05	05/23/21 01:26	1
d3-NMeFOSAA	68		50 - 150	05/20/21 20:05	05/23/21 01:26	1
d5-NEtFOSAA	63		50 - 150	05/20/21 20:05	05/23/21 01:26	1
13C3 HFPO-DA	64		50 - 150	05/20/21 20:05	05/23/21 01:26	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	28.7		0.1	0.1	%			05/21/21 12:41	1
Percent Solids	71.3		0.1	0.1	%			05/21/21 12:41	1

Eurofins TestAmerica, Sacramento

# Isotope Dilution Summary

Client: Shannon & Wilson, Inc  
 Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

## Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

Matrix: Solid

Prep Type: Total/NA

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	PFHxA (50-150)	C4PFHA (50-150)	PFOA (50-150)	PFNA (50-150)	PFDA (50-150)	PFUnA (50-150)	PFDaA (50-150)	PFTDA (50-150)
320-73902-1	21YAK-SS-01	79	71	76	72	72	79	74	68
320-73902-2	21YAK-SS-02	83	77	75	69	69	74	68	71
LCS 320-491259/2-A	Lab Control Sample	82	79	83	76	77	79	72	80
MB 320-491259/1-A	Method Blank	80	80	86	80	77	88	80	79

### Percent Isotope Dilution Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	C3PFBS (50-150)	PFHxS (50-150)	PFOS (50-150)	d3NMFOS (50-150)	d5NEFOS (50-150)	HFPODA (50-150)
320-73902-1	21YAK-SS-01	69	74	69	71	74	67
320-73902-2	21YAK-SS-02	71	73	64	68	63	64
LCS 320-491259/2-A	Lab Control Sample	74	82	78	75	79	74
MB 320-491259/1-A	Method Blank	79	80	77	83	80	77

### Surrogate Legend

PFHxA = 13C2 PFHxA  
 C4PFHA = 13C4 PFHpA  
 PFOA = 13C4 PFOA  
 PFNA = 13C5 PFNA  
 PFDA = 13C2 PFDA  
 PFUnA = 13C2 PFUnA  
 PFDaA = 13C2 PFDaA  
 PFTDA = 13C2 PFTeDA  
 C3PFBS = 13C3 PFBS  
 PFHxS = 18O2 PFHxS  
 PFOS = 13C4 PFOS  
 d3NMFOS = d3-NMeFOSAA  
 d5NEFOS = d5-NEtFOSAA  
 HFPODA = 13C3 HFPO-DA

# QC Sample Results

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

## Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15

**Lab Sample ID: MB 320-491259/1-A**  
**Matrix: Solid**  
**Analysis Batch: 491794**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 491259**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Perfluorohexanoic acid (PFHxA)	ND		0.20	0.042	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluoroheptanoic acid (PFHpA)	ND		0.20	0.029	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorooctanoic acid (PFOA)	ND		0.20	0.086	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorononanoic acid (PFNA)	ND		0.20	0.036	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorodecanoic acid (PFDA)	ND		0.20	0.022	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluoroundecanoic acid (PFUnA)	ND		0.20	0.036	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorododecanoic acid (PFDoA)	ND		0.20	0.067	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorotridecanoic acid (PFTriA)	ND		0.20	0.051	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorotetradecanoic acid (PFTeA)	ND		0.20	0.054	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorobutanesulfonic acid (PFBS)	ND		0.20	0.025	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorohexanesulfonic acid (PFHxS)	ND		0.20	0.031	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Perfluorooctanesulfonic acid (PFOS)	ND		0.50	0.20	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	ND		2.0	0.39	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	ND		2.0	0.37	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	ND		0.20	0.027	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	ND		0.25	0.11	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	ND		0.20	0.022	ug/Kg		05/20/21 20:05	05/23/21 00:58	1
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND		0.20	0.018	ug/Kg		05/20/21 20:05	05/23/21 00:58	1

Isotope Dilution	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
13C2 PFHxA	80		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C4 PFHpA	80		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C4 PFOA	86		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C5 PFNA	80		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C2 PFDA	77		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C2 PFUnA	88		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C2 PFDoA	80		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C2 PFTeDA	79		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C3 PFBS	79		50 - 150	05/20/21 20:05	05/23/21 00:58	1
18O2 PFHxS	80		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C4 PFOS	77		50 - 150	05/20/21 20:05	05/23/21 00:58	1
d3-NMeFOSAA	83		50 - 150	05/20/21 20:05	05/23/21 00:58	1
d5-NEtFOSAA	80		50 - 150	05/20/21 20:05	05/23/21 00:58	1
13C3 HFPO-DA	77		50 - 150	05/20/21 20:05	05/23/21 00:58	1

**Lab Sample ID: LCS 320-491259/2-A**  
**Matrix: Solid**  
**Analysis Batch: 491794**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 491259**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Perfluorohexanoic acid (PFHxA)	2.00	2.07		ug/Kg		104	70 - 132
Perfluoroheptanoic acid (PFHpA)	2.00	2.15		ug/Kg		107	71 - 131
Perfluorooctanoic acid (PFOA)	2.00	2.12		ug/Kg		106	69 - 133
Perfluorononanoic acid (PFNA)	2.00	2.10		ug/Kg		105	72 - 129

Eurofins TestAmerica, Sacramento

# QC Sample Results

Client: Shannon & Wilson, Inc  
 Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

## Method: EPA 537(Mod) - PFAS for QSM 5.3, Table B-15 (Continued)

**Lab Sample ID: LCS 320-491259/2-A**  
**Matrix: Solid**  
**Analysis Batch: 491794**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 491259**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Perfluorodecanoic acid (PFDA)	2.00	1.94		ug/Kg		97	69 - 133
Perfluoroundecanoic acid (PFUnA)	2.00	2.13		ug/Kg		106	64 - 136
Perfluorododecanoic acid (PFDoA)	2.00	2.06		ug/Kg		103	69 - 135
Perfluorotridecanoic acid (PFTriA)	2.00	2.41		ug/Kg		121	66 - 139
Perfluorotetradecanoic acid (PFTeA)	2.00	2.24		ug/Kg		112	69 - 133
Perfluorobutanesulfonic acid (PFBS)	1.77	1.86		ug/Kg		105	72 - 128
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.76		ug/Kg		97	67 - 130
Perfluorooctanesulfonic acid (PFOS)	1.86	1.99		ug/Kg		107	68 - 136
N-methylperfluorooctanesulfonamide acetic acid (NMeFOSAA)	2.00	2.15		ug/Kg		108	63 - 144
N-ethylperfluorooctanesulfonamide acetic acid (NEtFOSAA)	2.00	2.16		ug/Kg		108	61 - 139
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	1.86	1.97		ug/Kg		106	75 - 135
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	2.00	2.14		ug/Kg		107	77 - 137
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	1.88	1.99		ug/Kg		106	76 - 136
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	2.06		ug/Kg		109	79 - 139

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C2 PFHxA	82		50 - 150
13C4 PFHpA	79		50 - 150
13C4 PFOA	83		50 - 150
13C5 PFNA	76		50 - 150
13C2 PFDA	77		50 - 150
13C2 PFUnA	79		50 - 150
13C2 PFDoA	72		50 - 150
13C2 PFTeDA	80		50 - 150
13C3 PFBS	74		50 - 150
18O2 PFHxS	82		50 - 150
13C4 PFOS	78		50 - 150
d3-NMeFOSAA	75		50 - 150
d5-NEtFOSAA	79		50 - 150
13C3 HFPO-DA	74		50 - 150

# QC Association Summary

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

## LCMS

### Prep Batch: 491259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73902-1	21YAK-SS-01	Total/NA	Solid	SHAKE	
320-73902-2	21YAK-SS-02	Total/NA	Solid	SHAKE	
MB 320-491259/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-491259/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	

### Analysis Batch: 491794

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73902-1	21YAK-SS-01	Total/NA	Solid	EPA 537(Mod)	491259
320-73902-2	21YAK-SS-02	Total/NA	Solid	EPA 537(Mod)	491259
MB 320-491259/1-A	Method Blank	Total/NA	Solid	EPA 537(Mod)	491259
LCS 320-491259/2-A	Lab Control Sample	Total/NA	Solid	EPA 537(Mod)	491259

## General Chemistry

### Analysis Batch: 491523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-73902-1	21YAK-SS-01	Total/NA	Solid	D 2216	
320-73902-2	21YAK-SS-02	Total/NA	Solid	D 2216	



# Lab Chronicle

Client: Shannon & Wilson, Inc  
 Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

**Client Sample ID: 21YAK-SS-01**

**Lab Sample ID: 320-73902-1**

Date Collected: 05/16/21 10:39

Matrix: Solid

Date Received: 05/19/21 15:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			491523	05/21/21 12:41	TCS	TAL SAC

**Client Sample ID: 21YAK-SS-01**

**Lab Sample ID: 320-73902-1**

Date Collected: 05/16/21 10:39

Matrix: Solid

Date Received: 05/19/21 15:22

Percent Solids: 78.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.31 g	10.00 mL	491259	05/20/21 20:05	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			491794	05/23/21 01:17	GMK	TAL SAC

**Client Sample ID: 21YAK-SS-02**

**Lab Sample ID: 320-73902-2**

Date Collected: 05/16/21 10:57

Matrix: Solid

Date Received: 05/19/21 15:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1			491523	05/21/21 12:41	TCS	TAL SAC

**Client Sample ID: 21YAK-SS-02**

**Lab Sample ID: 320-73902-2**

Date Collected: 05/16/21 10:57

Matrix: Solid

Date Received: 05/19/21 15:22

Percent Solids: 71.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			5.32 g	10.00 mL	491259	05/20/21 20:05	FX	TAL SAC
Total/NA	Analysis	EPA 537(Mod)		1			491794	05/23/21 01:26	GMK	TAL SAC

**Laboratory References:**

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

# Accreditation/Certification Summary

Client: Shannon & Wilson, Inc  
 Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

## Laboratory: Eurofins TestAmerica, Sacramento

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	17-020	02-20-24
ANAB	Dept. of Defense ELAP	L2468	01-20-24
ANAB	Dept. of Energy	L2468.01	01-20-24
ANAB	ISO/IEC 17025	L2468	01-20-24
Arizona	State	AZ0708	08-11-21
Arkansas DEQ	State	88-0691	06-17-21
California	State	2897	01-31-22
Colorado	State	CA0004	08-31-21
Connecticut	State	PH-0691	06-30-21
Florida	NELAP	E87570	06-30-21
Georgia	State	4040	01-29-22
Hawaii	State	<cert No.>	01-29-22
Illinois	NELAP	200060	03-18-22
Kansas	NELAP	E-10375	10-31-21
Louisiana	NELAP	01944	06-30-21
Maine	State	CA00004	04-14-22
Michigan	State	9947	01-29-22
Nevada	State	CA000442021-2	07-31-21
New Hampshire	NELAP	2997	04-18-22
New Jersey	NELAP	CA005	06-30-21
New York	NELAP	11666	04-01-22
Ohio	State	41252	01-29-22
Oregon	NELAP	4040	01-30-23
Texas	NELAP	T104704399-19-13	05-31-21
US Fish & Wildlife	US Federal Programs	58448	07-31-21
USDA	US Federal Programs	P330-18-00239	07-31-21
Utah	NELAP	CA000442021-12	03-01-22
Virginia	NELAP	460278	03-14-22
West Virginia (DW)	State	9930C	12-31-21
Wisconsin	State	998204680	08-31-21
Wyoming	State Program	8TMS-L	01-28-19 *

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

Method	Method Description	Protocol	Laboratory
EPA 537(Mod)	PFAS for QSM 5.3, Table B-15	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

#### Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

# Sample Summary

Client: Shannon & Wilson, Inc  
Project/Site: YAK - May 2021 Soil

Job ID: 320-73902-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
320-73902-1	21YAK-SS-01	Solid	05/16/21 10:39	05/19/21 15:22	
320-73902-2	21YAK-SS-02	Solid	05/16/21 10:57	05/19/21 15:22	

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2355 Hill Road  
Fairbanks, AK 99709  
(907) 479-0600  
www.shannonwilson.com

# CHAIN-OF-CUSTODY RECORD

Laboratory Test America Page 1 of 1  
Attn: David Altucher

Analytical Methods (include preservative if used)

Quote No: \_\_\_\_\_  
J-Flags:  Yes  No

Turn Around Time:  
 Normal  Rush  
Please Specify \_\_\_\_\_

Lab No.	Time	Date Sampled	Total Number of Containers	Remarks/Matrix Composition/Grab? Sample Containers
21YAK-SS-01	1039	5/16/21	1	Soil
21YAK-SS-02	1057	5/16/21	1	Soil



320-73902 Chain of Custody

Project Information	Sample Receipt	Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Number: <u>102896-006</u>	Total No. of Containers: <u>2</u>	Signature: <u>Michael</u>	Signature: _____	Signature: _____
Name: <u>YAK - May 2021 Ss.1</u>	COC Seals/Intact? <u>Y/N/NA</u>	Printed Name: <u>Michael</u>	Printed Name: _____	Printed Name: _____
Contact: <u>AMT</u>	Received Good Cond./Cold	Date: <u>5/16/21</u>	Date: _____	Date: _____
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Temp: <u>2.5</u>	Company: <u>Shannon &amp; Wilson, Inc.</u>	Company: _____	Company: _____
Sampler: <u>MAXJ</u>	Delivery Method: _____			
Notes:		Received By: 1.	Received By: 2.	Received By: 3.
		Signature: _____	Signature: _____	Signature: _____
		Printed Name: <u>Cheng Vang</u>	Printed Name: _____	Printed Name: _____
		Company: <u>ETA SAC</u>	Company: _____	Company: _____

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report  
Yellow - w/shipment - for consignee files  
Pink - Shannon & Wilson - job file

No. 36400

2.5%

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# Login Sample Receipt Checklist

Client: Shannon & Wilson, Inc

Job Number: 320-73902-1

**Login Number: 73902**

**List Source: Eurofins TestAmerica, Sacramento**

**List Number: 1**

**Creator: Oropeza, Salvador**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	Seals
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	gel packs only
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Laboratory Data Review Checklist

Completed By:

Justin Risley / Kristen Freiburger

Title:

Engineering Staff / Associate

Date:

June 2, 2021

Consultant Firm:

Shannon & Wilson, Inc.

Laboratory Name:

Eurofins TestAmerica, Sacramento

Laboratory Report Number:

320-73902-1 Revision 1

Laboratory Report Date:

6/3/2021

CS Site Name:

Yakutat Airport PFAS

ADEC File Number:

1530.38.022

Hazard Identification Number:

27090

Laboratory Report Date:

6/3/2021

CS Site Name:

Yakutat Airport PFAS

**Note: Any N/A or No box checked must have an explanation in the comments box.**

1. Laboratory

a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses?

Yes  No  N/A  Comments:

b. If the samples were transferred to another “network” laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS approved?

Yes  No  N/A  Comments:

Samples were not transferred to another lab or sub-contracted out.

2. Chain of Custody (CoC)

a. CoC information completed, signed, and dated (including released/received by)?

Yes  No  N/A  Comments:

b. Correct analyses requested?

Yes  No  N/A  Comments:

3. Laboratory Sample Receipt Documentation

a. Sample/cooler temperature documented and within range at receipt (0° to 6° C)?

Yes  No  N/A  Comments:

Cooler was received at 2.5°C

b. Sample preservation acceptable – acidified waters, Methanol preserved VOC soil (GRO, BTEX, Volatile Chlorinated Solvents, etc.)?

Yes  No  N/A  Comments:

PFAS samples do not require preservation outside of the temperature requirement.



Laboratory Report Date:

6/3/2021

CS Site Name:

Yakutat Airport PFAS

c. Sample condition documented – broken, leaking (Methanol), zero headspace (VOC vials)?

Yes  No  N/A  Comments:

The samples were received in good condition, properly preserved and on ice.

d. If there were any discrepancies, were they documented? For example, incorrect sample containers/preservation, sample temperature outside of acceptable range, insufficient or missing samples, etc.?

Yes  No  N/A  Comments:

No discrepancies were noted.

e. Data quality or usability affected?

Comments:

Data quality or usability is unaffected.

4. Case Narrative

a. Present and understandable?

Yes  No  N/A  Comments:

b. Discrepancies, errors, or QC failures identified by the lab?

Yes  No  N/A  Comments:

Method SHAKE: The following samples were yellow after final volume/extraction: 21YAK-SS-01 (320-73902-1) and 21YAK-SS-02 (320-73902-2).

c. Were all corrective actions documented?

Yes  No  N/A  Comments:

No corrective actions were necessary.

d. What is the effect on data quality/usability according to the case narrative?

Comments:

Data quality/usability is not affected.

Laboratory Report Date:

6/3/2021

CS Site Name:

Yakutat Airport PFAS

5. Samples Results

a. Correct analyses performed/reported as requested on COC?

Yes  No  N/A  Comments:

b. All applicable holding times met?

Yes  No  N/A  Comments:

c. All soils reported on a dry weight basis?

Yes  No  N/A  Comments:

d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project?

Yes  No  N/A  Comments:

e. Data quality or usability affected?

Data quality or usability is unaffected; see above.

6. QC Samples

a. Method Blank

i. One method blank reported per matrix, analysis and 20 samples?

Yes  No  N/A  Comments:

ii. All method blank results less than limit of quantitation (LOQ) or project specified objectives?

Yes  No  N/A  Comments:

Laboratory Report Date:

6/3/2021

CS Site Name:

Yakutat Airport PFAS

iii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iv. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes  No  N/A  Comments:

See above.

v. Data quality or usability affected?

Comments:

Data quality or usability is unaffected; see above.

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

i. Organics – One LCS/LCSD reported per matrix, analysis and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846)

Yes  No  N/A  Comments:

An LCS was reported, but not an LCSD.

ii. Metals/Inorganics – one LCS and one sample duplicate reported per matrix, analysis and 20 samples?

Yes  No  N/A  Comments:

Metals/Inorganics were not submitted with this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages)

Yes  No  N/A  Comments:

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from LCS/LCSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages)

Yes  No  N/A  Comments:

Laboratory precision could not be assessed as no LCSD was present.

Laboratory Report Date:

6/3/2021

CS Site Name:

Yakutat Airport PFAS

v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

N/A; see above.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes  No  N/A  Comments:

See above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality or usability was not affected.

c. Matrix Spike/Matrix Spike Duplicate (MS/MSD)

**Note: Leave blank if not required for project**

i. Organics – One MS/MSD reported per matrix, analysis and 20 samples?

Yes  No  N/A  Comments:

An MS/MSD was not reported for this work order. Laboratory precision is indeterminant without the LCS/LCSD pair.

ii. Metals/Inorganics – one MS and one MSD reported per matrix, analysis and 20 samples?

Yes  No  N/A  Comments:

Metals/Inorganics were not submitted with this work order.

iii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable?

Yes  No  N/A  Comments:

See above.

iv. Precision – All relative percent differences (RPD) reported and less than method or laboratory limits and project specified objectives, if applicable? RPD reported from MS/MSD, and or sample/sample duplicate.

Yes  No  N/A  Comments:

See above.

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v. If %R or RPD is outside of acceptable limits, what samples are affected?

Comments:

N/A; see above.

vi. Do the affected sample(s) have data flags? If so, are the data flags clearly defined?

Yes  No  N/A  Comments:

See above.

vii. Data quality or usability affected? (Use comment box to explain.)

Comments:

Data quality or usability was not affected.

d. Surrogates – Organics Only or Isotope Dilution Analytes (IDA) – Isotope Dilution Methods Only

i. Are surrogate/IDA recoveries reported for organic analyses – field, QC and laboratory samples?

Yes  No  N/A  Comments:

ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits and project specified objectives, if applicable? (AK Petroleum methods 50-150 %R for field samples and 60-120 %R for QC samples; all other analyses see the laboratory report pages)

Yes  No  N/A  Comments:

iii. Do the sample results with failed surrogate/IDA recoveries have data flags? If so, are the data flags clearly defined?

Yes  No  N/A  Comments:

There were no failed surrogate/IDA recoveries reported.

iv. Data quality or usability affected?

Comments:

Data quality or usability was not affected.

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e. Trip Blanks

- i. One trip blank reported per matrix, analysis and for each cooler containing volatile samples?  
(If not, enter explanation below.)

Yes  No  N/A  Comments:

PFAS is not a volatile compound, therefore a trip blank is not required.

- ii. Is the cooler used to transport the trip blank and VOA samples clearly indicated on the COC?  
(If not, a comment explaining why must be entered below)

Yes  No  N/A  Comments:

See above.

- iii. All results less than LOQ and project specified objectives?

Yes  No  N/A  Comments:

See above.

- iv. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; see above.

- v. Data quality or usability affected?

Comments:

Data quality or usability was not affected.

f. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes  No  N/A  Comments:

Field duplicates were not required for this part of the project.

- ii. Submitted blind to lab?

Yes  No  N/A  Comments:

See above.

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iii. Precision – All relative percent differences (RPD) less than specified project objectives?  
(Recommended: 30% water, 50% soil)

$$\text{RPD (\%)} = \text{Absolute value of: } \frac{(R_1 - R_2)}{((R_1 + R_2) / 2)} \times 100$$

Where  $R_1$  = Sample Concentration  
 $R_2$  = Field Duplicate Concentration

Yes  No  N/A  Comments:

See above.

iv. Data quality or usability affected? (Use the comment box to explain why or why not.)

Comments:

Data quality or usability was not affected.

g. Decontamination or Equipment Blank (If not applicable, a comment stating why must be entered below)?

Yes  No  N/A  Comments:

Reusable equipment was not used to collect the samples, therefore an equipment blanks in not required.

i. All results less than LOQ and project specified objectives?

Yes  No  N/A  Comments:

See above.

ii. If above LOQ or project specified objectives, what samples are affected?

Comments:

N/A; see above.

iii. Data quality or usability affected?

Comments:

Data quality or usability was not affected.

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7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab Specific, etc.)

a. Defined and appropriate?

Yes  No  N/A  Comments:

No additional data flags necessary.