

November 16, 2015

Janine Boyette  
Response & Remediation SME  
Alyeska Pipeline Service Company  
3700 Centerpoint Drive – MS 507  
Anchorage, AK 99519-6660

**Re: Pump Station 3 Drinking Water PFAS Sampling Summary**

Dear Janine,

This letter report summarizes our current knowledge of the former Fire Training Area site and the water quality from the drinking water system at Pump Station 3 (PS03).

During our annual meeting with Grant Lidren to discuss Alyeska contaminated sites and areas of concern, Grant requested a summary update with recommendations for additional work needed, if any, to rule out potential PFAS contamination from the former FTA at PS03. We visited the FTA site with Grant in July, 2018 and discussed the location of the drinking water wells in relation to the former FTA and if drinking water might be impacted by PFAS contamination from the FTA, if present.

In September 2018, I received the latest drawings of the PS03 drinking water well locations. Figure 1 identifies the location of the former FTA and the location of 3 water supply wells (PW-1, PW-2, and PW-3) and the raw water tank at PS03. The three shallow water supplying wells are installed adjacent to the buried Trans Alaska Pipeline. We confirmed that the only operating well at PS03 is PW-3, the southernmost well identified on Figure 1. This well is approximately 220 feet ENE of the footprint of the former FTA and is currently used to supply water for the facility.

Alyeska's Analytical Services team sampled the drinking water systems at PS01, PS03, and PS04, in early 2018 and the samples were analyzed for PFAS by SGS North America in Orlando, Florida. Data was received from the lab in March 2018 and all samples were non-detect for PFAS but the lab data did not identify the Limit of Detection (LOD) which is required for analyzing the sum of non-detect data from PFAS. A revised Data Set was received from SGS on November 9, 2018 that included reporting limits for Detection Limits, Limit of Detection and Limit of Quantitation for all samples. Again, no PFAS compounds were detected at concentration above the LOD and the sum of the concentrations of the 5 regulated PFAS did not exceed the ADEC drinking water levels. A summary table of the drinking water results from PS01, PS03, and PS04 are included below. The PS03 sample is labeled MCCF #2 Plant Raw Water Tank.

Water to the tank was supplied by well PW-3. It should be noted that drinking water at PS01 is provided by the North Slope Borough.

Compound in micrograms per liter (µg/L)	Screening Criteria	Drinking Water Samples <sup>B</sup>		
	ADEC Action Levels for PFAS in Groundwater and Surface Water Used as Drinking Water <sup>A</sup>	PS01 Pre-CI Treatment Room	MCCF #2 Plant Raw Water Tank	PS04 Tea Lake Well
		P18-002-01 1189007001 FA50819-1 05-Jan-2018	P18-002-02 1189007002 FA50819-2 04-Jan-2018	P18-002-03 1189007003 FA50819-3 04-Jan-2018
<b>PFAS (EPA 537M)</b>		Concentration <sup>C</sup>	Concentration <sup>C</sup>	Concentration <sup>C</sup>
PFOS	--	0.00605 J	[0.0031] ND	[0.0032] ND
PFOA	--	[0.0032] ND	[0.0031] ND	[0.0032] ND
PFNA	--	0.00247 J	[0.0031] ND	[0.0032] ND
PFHxS	--	0.00591 J	[0.0058] ND	[0.0060] ND
PFHpA	--	[0.0060] ND	[0.0058] ND	[0.0060] ND
Summed Action Level <sup>D</sup>	0.07	0.02363 J	[0.0209] ND	[0.0216] ND
PFBS	2.0	[0.0060] ND	[0.0058] ND	[0.0060] ND

**Notes:**

<sup>A</sup>ADEC Technical Memorandum, Action levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water (August 20, 2018).

<sup>B</sup>The sample location, sample identifier, SGS Anchorage laboratory ID, SGS Orlando laboratory ID, and date collected are provided.

<sup>C</sup>For detected results, the sample result is listed in µg/l in this column. For non-detect results, the LOD is shown in [ ].

<sup>D</sup>Total values were the summation of detected values and non-detected LODs.

**Bold** - Above the Action Level noted in footnote A

**Abbreviations:**

ADEC - Alaska Department of Environmental Conservation  
EPA - Environmental Protection Agency  
LOD - limit of detection  
LOQ - limit of quantitation  
µg/L - micrograms per liter

PFAS - per- and poly-fluoroalkyl substances  
PFOA - perfluorooctanoic acid  
PFOS - perfluorooctanesulfonic acid  
PFNA - perfluorononanoic acid  
PFHxS - perfluorohexanesulfonic acid  
PFHpA - perfluoroheptanoic acid  
PFBS - perfluorobutanesulfonic acid

**Data Flags:**

ND - not detected at or above LOD  
J - estimated value below the LOQ

A copy of the complete laboratory report is included as an appendix to this report. None of the regulated PFAS compounds were detected above the LOD and the sum of the five compounds was well below the ADEC Summed Action Level.

The fire training area was decommissioned and remediated by Alyeska in 2008 and 2010. During the 2008 excavation activities, permafrost was encountered at a depth of approximately 1 foot below the ground surface. The final excavation in 2010 removed 90 cubic yards of soil to a maximum depth of 2.5 feet. Permafrost soils were encountered in the entire excavation. No closure samples contained petroleum hydrocarbons or VOC's in excess of ADEC soil cleanup levels.

SLR does not recommend any additional corrective action activities at this site. This is based on the knowledge that all petroleum hydrocarbon contamination was removed from the site, the area around

PS03 is underlain by continuous permafrost soils, the closest drinking water supply well is over 220 feet away from the former FTA, and no PFAS compounds were detected in the drinking water sample.

The former FTA was backfilled with clean fill and is located on the far western edge of the lower yard.

SLR recommends that the site remain undisturbed to prevent thawing the underlying permafrost soils.

Sincerely,

**SLR International Corporation**

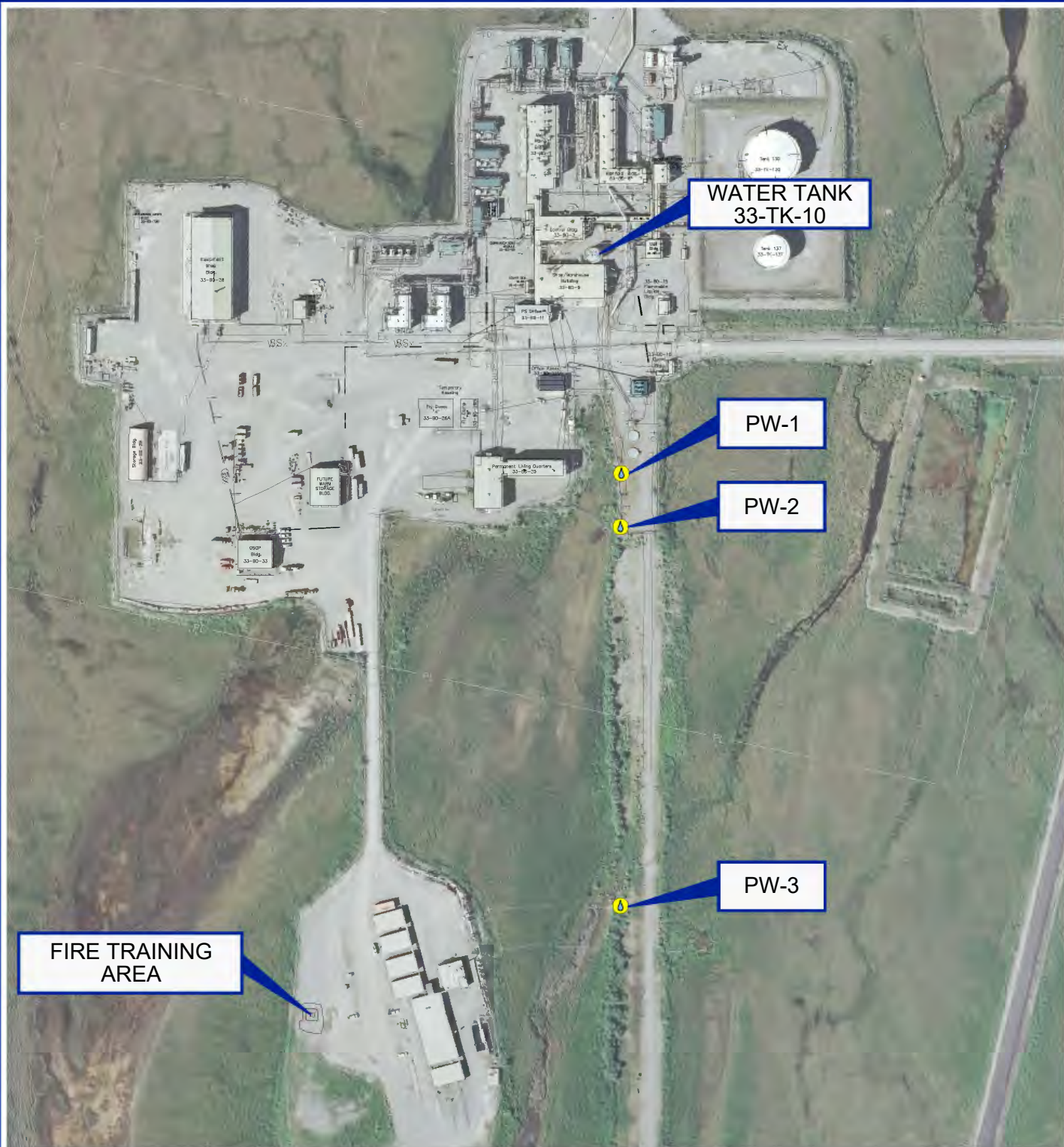


Scott Rose

Principal Geologist

Enc     Figure 1: Site Location Map  
Laboratory Report





FIRE TRAINING  
AREA

WATER TANK  
33-TK-10

PW-1

PW-2

PW-3

SCALE: 1" = 300'  
WHEN PLOTTED AT 8.5 x 11 PAGE SIZE  
0 100' 200' 300'

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL  
LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.



ALYESKA PIPELINE SERVICE COMPANY  
PUMP STATION 3  
PIPELINE MILEPOST 104.2

Report

PUMP STATION 3 FIRE TRAINING AREA

Drawing

SITE VICINITY MAP

Date October 2018

Scale 1" = 300'

Fig. No.

File Name P03\_FTA\_18

Project No. 105.01288.18039

1

## Laboratory Report of Analysis

To: Alyeska Pipeline Srv Co.  
PO Box 196660  
Anchorage, AK 99519  
(907)787-8627

Revised Report - Revision 2 - This report has been reissued  
to report DL/LOD/LOQ format, per client request.

Report Number: **1189007**

Client Project: **P18-002 PFAS in Drinking Water**

Dear Marina Mitchell,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,  
SGS North America Inc.

Justin Nelson  
Project Manager  
Justin.Nelson@sgs.com

\_\_\_\_\_  
Date

## Case Narrative

SGS Client: **Alyeska Pipeline Srv Co.**  
 SGS Project: **1189007**  
 Project Name/Site: **P18-002 PFAS in Drinking Water**  
 Project Contact: **Marina Mitchell**

Refer to sample receipt form for information on sample condition.

### **P18-002-01 (1189007001) PS**

PFAS per EPA 537 were analyzed by SGS of Orlando, FL.

\*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 11/09/2018 2:37:42PM

## Sample Summary

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Collected</u>	<u>Received</u>	<u>Matrix</u>
P18-002-01	1189007001	01/05/2018	01/09/2018	Drinking Water
P18-002-02	1189007002	01/04/2018	01/09/2018	Drinking Water
P18-002-03	1189007003	01/04/2018	01/09/2018	Drinking Water
D.I. Blank	1189007004	01/08/2018	01/09/2018	Drinking Water

### Method

### Method Description

Print Date: 11/09/2018 2:37:47PM



# CHAIN OF CUSTODY RECORD

<b>LABORATORY:</b> SGS 200 West Potter Drive Anchorage, Alaska 99518 (907) 562-2343 Attn.: Justin Nelson		<b>CUSTODY RECORD / REPORT TO:</b> Alyeska Pipeline Service Co. Attn: Marina Mitchell P.O. Box 196660 Anchorage, AK 99519-6660 FAX: (907) 787-8778 Phone: (907) 787-8627				<b>ANALYSES REQUESTED</b> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; width: 20px; height: 20px;"></div> </div>				<b>LAB PROJECT #:</b>  	<b>ALYESKA PROJECT #:</b>  P18-002		
<b>SAMPLER:</b> Complete record, copy, and send original with samples.		<div style="writing-mode: vertical-rl; transform: rotate(180deg);">PFAS per EPA 537</div>				<b>PROJECT NAME:</b>  PFAS in Drinking Water							
<b>LABORATORY:</b> On receipt of samples, complete record. On completion of analysis, return copy of record with report. Notify Analytical Services before disposal of samples.						<b>REQUESTED TURNAROUND TIME:</b>  21 Days							
*Sample Type - Grab, Composite, flow-weighted, continuous monitoring **Matrix - water, soil, air, sludge, organic liquid, sea-water						<b>REMARKS</b>							
SAMPLE ID	SAMPLED BY	SAMPLE DATE	SAMPLE TIME	SAMPLE LOCATION	SAMPLE TYPE*	CONTAINERS	PRESERVATIVE	MATRIX**					
P18-002-01	①A-B	SJL	1/5/18	10:24	PS01 Pre-cl H2O Treatment Rm	grab	2x250mL	<6 °F	DW	X			
P18-002-02	②A-B	SJL	1/4/18	16:45	MCCF#2 Plant Raw H2O Tk	grab	2x250mL	<6 °F	DW	X			
P18-002-03	③A-B	SJL	1/4/18	18:10	PS04 Tea Lake Well	grab	2x250mL	<6 °F	DW	X			
Extract all samples within 14 days of collection.													
D.I. Blank ④A-B JN 1/9/18 1200 SGS ANC G 2x250 DI X													
Note: All samples go to SGS-Orlando													
RELINQUISHED BY: (1)				DATE:	TIME:	RECEIVED BY:				DATE:	TIME:		
<i>Stephen Linder</i>				1-5-2018	11:20	<i>[Signature]</i>				1-5-18	1550		
RELINQUISHED BY: (2)				DATE:	TIME:	RECEIVED BY:				DATE:	TIME:		
<i>[Signature]</i>				1-8-18	1500	<i>[Signature]</i>							
RELINQUISHED BY: (3)				DATE:	TIME:	RECEIVED FOR LAB BY:				DATE:	TIME:		
<i>[Signature]</i>						<i>[Signature]</i> NW				1/9/18	08:13		
AIR BILL # (attach receipts):				Custody seal #	Chain of Custody Seal (circle)		Thermal Preservation Met?		YES		NO		
				016106, 016107	<input checked="" type="radio"/> intact <input type="radio"/> broken <input type="radio"/> absent		Cooler Temperature:		Temperature Blank: 5.6°C				





### FAIRBANKS SAMPLE RECEIPT FORM

**Note: This form is to be completed by Fairbanks Receiving Staff for all samples**


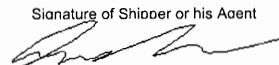
Review Criteria:	Condition:	Comments/Actions Taken
Were <b>custody seals</b> intact? Note # & location, if applicable. COC accompanied samples?	<input checked="" type="radio"/> Yes No N/A <input checked="" type="radio"/> Yes No N/A	<input type="checkbox"/> Exemption permitted if sampler hand carries/delivers.
<b>Temperature blank</b> compliant* (i.e., 0-6°C) If >6°C, were samples collected <8 hours ago? If <0°C, were all sample containers ice free? Cooler ID: <u>1</u> @ <u>5.6</u> w/Therm. ID: <u>DZS</u> Cooler ID: _____ @ _____ w/Therm. ID: _____ Cooler ID: _____ @ _____ w/Therm. ID: _____ Cooler ID: _____ @ _____ w/Therm. ID: _____ Cooler ID: _____ @ _____ w/Therm. ID: _____ If samples are received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank and "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note ambient ( ) or chilled ( ). Please check one.	<input checked="" type="radio"/> Yes No <u>N/A</u> <input checked="" type="radio"/> Yes No <u>N/A</u> <input checked="" type="radio"/> Yes No <u>N/A</u>	<input type="checkbox"/> Exemption permitted if chilled & collected <8hrs ago   <i>Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.</i>
Delivery Method: <u>Client (hand carried)</u> Other: _____	Tracking/AB# : Or see attached <u>Or N/A</u>	
→For samples received with payment, note amount (\$) and whether cash / check / CC ( <b>circle one</b> ) was received.		
Were samples in <b>good condition</b> (no leaks/cracks/breakage)? Packing material used (specify all that apply): <u>Bubble Wrap</u> Separate plastic bags Vermiculite Other: _____	<input checked="" type="radio"/> Yes No N/A	<i>Note: some samples are sent to Anchorage without inspection by SGS Fairbanks personnel.</i>
Were <b>Trip Blanks</b> (i.e., VOAs, LL-Hg) in cooler with samples?	Yes No <u>N/A</u>	
For <b>RUSH/SHORT Hold Time</b> , were COC/Bottles flagged accordingly? Was Rush/Short HT email sent, if applicable?	Yes No <u>N/A</u> Yes No <u>N/A</u>	
Additional notes (if applicable):		
<div style="border: 1px solid black; padding: 5px; margin-top: 20px;">Profile #:</div>		

*Note to Client: any "no" circled above indicates non-compliance with standard procedures and may impact data quality.*

027 FAI 3444 1444

Revised Report - Revision 2 027-3444 1444

2812  
9:59

Shipper's Name and Address SGS CT and ENVIRONM 200 W Potter Drive Anchorage, AK 99518 USA Tel: 907-562-2343		Shipper's Account Number 27400215947 Customer's ID Number 9069		Not Negotiable <b>Air Waybill</b> Issued By <i>Alaska.</i> <b>AIR CARGO</b> P.O. BOX 68900 SEATTLE, WA 98168 800-225-2752 ALASKACARGO.COM	
Consignee's Name and Address SGS CT and ENVIRONM 200 W Potter Drive Anchorage, AK 99518 USA Tel: 907-562-2343		Consignee's Account Number 27400215947		Also notify  Tel:	
Issuing Carrier's Agent and City		Accounting Information SGS CT and ENVIRONMENTAL SVS 200 W Potter Drive Anchorage, AK 99518 USA GoldStreak		9069 <b>1189007</b> 	
Agent's IATA Code		Account No.			
Airport of Departure (Addr. of First Carrier) and Requested Routing Fairbanks					
To	By First Carrier	To / By		Currency	WT/VAL
ANC	Alaska Airlines			USD PX	X
Airport of Destination		Flight/Date	Flight/Date	Amount of Insurance	
Anchorage		AS 2812/08		XXX	
Handling Information PERISHABLE CARGO (NON - FOOD)					
SCI					
No of Pieces	Gross Weight	kg lb	Commodity Item No.	Chargeable Weight	Rate / Charge
2	17.0	L		17.0	
				Total	
				AS AGREED	
				Nature and Quantity of Goods (Incl. Dimensions or Volume)	
				WATER SAMPLES AMBIENT  Dims: 11 x 9 x11 x 1 11 x 9 x9 x 1  GSX PER Volume: 1.146	
2	17.0				AS AGREED
Prepaid		Weight Charge		Collect	
AS AGREED				Other Charges	
		Valuation Charge		XBC 0.00	
		Tax			
Total Other Charges Due Agent		Shipper certifies that the particulars on the face hereof are correct and that insofar as any part of the consignment contains dangerous goods, such part is properly described by name and is in proper condition for carriage by air according to the applicable Dangerous Goods Regulations. I consent to the inspection of this cargo.			
Total Other Charges Due Carrier		For: SGS CT and ENVIRONMENTAL SVS			
		Signature of Shipper or his Agent			
					
Total Prepaid		Total Collect		THIS SHIPMENT DOES NOT CONTAIN DANGEROUS GOODS	
AS AGREED				THIS SHIPMENT DOES CONTAIN DANGEROUS GOODS	
				08 Jan 2018 16:32 Fairbanks Alaska Airlines	
				Executed On (Date) at (Place) Signature of Issuing Carrier or its Agent	
				027-3444 1444	

**Alert Expeditors Inc:****#381693**

Citywide Delivery • 440-3351  
 8421 Flamingo Drive • Anchorage, Alaska 99502

Date

1918

From

To

SGS

Collect ☐Prepay ☐Advance Charges ☐Account ☐

Job #

PO#

2017

3444 1444

GSX

**1189007**

Shipped Signature

7 of 26

Total Charge



## e-Sample Receipt Form

Revised Report - Revision 2

SGS Workorder #:

1189007



1 1 8 9 0 0 7

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
<b>Chain of Custody / Temperature Requirements</b>		n/a Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location?	yes	1-F, 1-B
COC accompanied samples?	yes	
n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	yes	Cooler ID: 1 @ 3.0 °C Therm. ID: D26
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	n/a	
If <0°C, were sample containers ice free?	n/a	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "COOLER TEMP" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature. Use form FS-0029 if more space is needed.		
<b>Holding Time / Documentation / Sample Condition Requirements</b>		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples match COC** (i.e., sample IDs, dates/times collected)?	yes	
**Note: If times differ <1hr, record details & login per COC.		
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
n/a ***Exemption permitted for metals (e.g., 200.8/6020A).		
Were proper containers (type/mass/volume/preservative***) used?	yes	
<b>Volatile / LL-Hg Requirements</b>		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	n/a	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	n/a	
Were all soil VOAs field extracted with MeOH+BFB?	n/a	
<b>Note to Client:</b> Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.		
Additional notes (if applicable):		
Sample 4 was collected at SGS under client instructions by JAN at the date and time listed on the COC. The collection date is listed as 1/8/18 on the log-in paperwork solely to bypass the LIMS error with the received by date. This was approved by JAN.		

## Sample Containers and Preservatives

<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>	<u>Container Id</u>	<u>Preservative</u>	<u>Container Condition</u>
1189007001-A	No Preservative Required	OK			
1189007001-B	No Preservative Required	OK			
1189007002-A	No Preservative Required	OK			
1189007002-B	No Preservative Required	OK			
1189007003-A	No Preservative Required	OK			
1189007003-B	No Preservative Required	OK			
1189007004-A	No Preservative Required	OK			
1189007004-B	No Preservative Required	OK			

### Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM - The container was received damaged.

FR - The container was received frozen and not usable for Bacteria or BOD analyses.

IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.





Orlando, FL

11/09/18

11/09/18

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report***Technical Report for****SGS North America, Inc****1189007****SGS Job Number: FA50819****Sampling Dates: 01/04/18 - 01/09/18****Report to:**

SGS North America, Inc  
 200 W Potter Dr  
 Anchorage, AK 99518  
 julie.shumway@sgs.com

**ATTN: Julie Shumway****Total number of pages in report: 17**

Test results contained within this data package meet the requirements  
 of the National Environmental Laboratory Accreditation Program  
 and/or state specific certification programs as applicable.

**Caitlin Brice, M.S.**  
**General Manager**

**Client Service contact: Heather Wandrey 407-425-6700**

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)  
 DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),  
 AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.

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SGS North America Inc.

## Sample Summary

SGS North America, Inc

**Job No:** FA50819

1189007

<b>Sample Number</b>	<b>Collected Date</b>	<b>Time By</b>	<b>Received</b>	<b>Matrix Code Type</b>	<b>Client Sample ID</b>
FA50819-1	01/05/18	10:24 JS	01/11/18	DW Drinking Water	P18-002-01
FA50819-2	01/04/18	16:45 JS	01/11/18	DW Drinking Water	P18-002-02
FA50819-3	01/04/18	18:10 JS	01/11/18	DW Drinking Water	P18-002-03
FA50819-4	01/09/18	12:00 JS	01/11/18	DW Drinking Water	DI BLANK

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** SGS North America, Inc

**Job** FA50819

**Site:** 1189007

**Report** 1/19/2018 8:25:41

4 Samples were collected on/between 01/04/2018 and 01/09/2018 and were received at SGS North America Inc - Orlando on 01/11/2018 properly preserved, at 4.6 Deg. C and intact. These Samples received an SGS Orlando job number of FA50819. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### MS Semi-volatiles By Method EPA 537

**Matrix:** DW

**Batch ID:** OP68362

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA50820-7MS, FA50820-7MSD were used as the QC samples indicated.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Date: January 19, 2018

\_\_\_\_\_  
Lovelie Metzgar, QA Officer (signature on file)

**Summary of Hits**

Page 1 of 1

**Job Number:** FA50819  
**Account:** SGS North America, Inc  
**Project:** 1189007  
**Collected:** 01/04/18 thru 01/09/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**FA50819-1 P18-002-01**

Perfluorohexanoic acid	0.00465 J	0.0080	0.0060	ug/l	EPA 537
Perfluorononanoic acid	0.00247 J	0.0080	0.0032	ug/l	EPA 537
Perfluorohexanesulfonic acid	0.00591 J	0.0080	0.0060	ug/l	EPA 537
Perfluorooctanesulfonic acid	0.00605 J	0.0080	0.0032	ug/l	EPA 537

**FA50819-2 P18-002-02**

No hits reported in this sample.

**FA50819-3 P18-002-03**

No hits reported in this sample.

**FA50819-4 DI BLANK**

No hits reported in this sample.





Orlando, FL

**Section 4**

4

**Sample Results**

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**Report of Analysis**

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SGS North America Inc.

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	P18-002-01		
<b>Lab Sample ID:</b>	FA50819-1	<b>Date Sampled:</b>	01/05/18
<b>Matrix:</b>	DW - Drinking Water	<b>Date Received:</b>	01/11/18
<b>Method:</b>	EPA 537 EPA 537	<b>Percent Solids:</b>	n/a
<b>Project:</b>	1189007		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q10260.D	1	01/17/18 16:01	NG	01/15/18 10:00	OP68362	S2Q194
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

## Perfluorinated Alkyl Acids

CAS No.	Compound	Result	MCL	LOQ	LOD	DL	Units	Q
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## PERFLUOROALKYLCARBOXYLIC ACIDS

2706-90-3	Perfluoropentanoic acid <sup>a</sup>	0.0060 U		0.0080	0.0060	0.0040	ug/l	
307-24-4	Perfluorohexanoic acid	0.00465		0.0080	0.0060	0.0040	ug/l	J
375-85-9	Perfluoroheptanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0032 U		0.0080	0.0032	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.00247		0.0080	0.0032	0.0020	ug/l	J
335-76-2	Perfluorodecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	

## PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.00591		0.0080	0.0060	0.0040	ug/l	J
1763-23-1	Perfluorooctanesulfonic acid	0.00605		0.0080	0.0032	0.0020	ug/l	J

## PERFLUOROOCETANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.016 U		0.020	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U		0.020	0.016	0.0080	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	90%		70-130%
	13C2-PFDA	87%		70-130%
	d5-EtFOSAA	83%		70-130%

(a) Associated BS recovery outside control limits.

U = Not detected      LOD = Limit of Detection  
MCL = Maximum Contamination Level (40 CFR 141)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

SGS North America Inc.

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	P18-002-02	<b>Date Sampled:</b>	01/04/18
<b>Lab Sample ID:</b>	FA50819-2	<b>Date Received:</b>	01/11/18
<b>Matrix:</b>	DW - Drinking Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537 EPA 537		
<b>Project:</b>	1189007		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q10261.D	1	01/17/18 16:23	NG	01/15/18 10:00	OP68362	S2Q194
Run #2							

	Initial Volume	Final Volume
Run #1	260 ml	1.0 ml
Run #2		

## Perfluorinated Alkyl Acids

CAS No.	Compound	Result	MCL	LOQ	LOD	DL	Units	Q
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## PERFLUOROALKYLCARBOXYLIC ACIDS

2706-90-3	Perfluoropentanoic acid <sup>a</sup>	0.0058 U		0.0077	0.0058	0.0038	ug/l	
307-24-4	Perfluorohexanoic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
335-67-1	Perfluorooctanoic acid	0.0031 U		0.0077	0.0031	0.0019	ug/l	
375-95-1	Perfluorononanoic acid	0.0031 U		0.0077	0.0031	0.0019	ug/l	
335-76-2	Perfluorodecanoic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
307-55-1	Perfluorododecanoic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	

## PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0058 U		0.0077	0.0058	0.0038	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0031 U		0.0077	0.0031	0.0019	ug/l	

## PERFLUOROOCETANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.015 U		0.019	0.015	0.0077	ug/l	
2991-50-6	EtFOSAA	0.015 U		0.019	0.015	0.0077	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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	13C2-PFHxA	86%		70-130%
	13C2-PFDA	90%		70-130%
	d5-EtFOSAA	88%		70-130%

(a) Associated BS recovery outside control limits.

U = Not detected      LOD = Limit of Detection  
MCL = Maximum Contamination Level (40 CFR 141)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

SGS North America Inc.

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	P18-002-03	<b>Date Sampled:</b>	01/04/18
<b>Lab Sample ID:</b>	FA50819-3	<b>Date Received:</b>	01/11/18
<b>Matrix:</b>	DW - Drinking Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537 EPA 537		
<b>Project:</b>	1189007		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q10262.D	1	01/17/18 16:45	NG	01/15/18 10:00	OP68362	S2Q194
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

## Perfluorinated Alkyl Acids

CAS No.	Compound	Result	MCL	LOQ	LOD	DL	Units	Q
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## PERFLUOROALKYLCARBOXYLIC ACIDS

2706-90-3	Perfluoropentanoic acid <sup>a</sup>	0.0060 U		0.0080	0.0060	0.0040	ug/l	
307-24-4	Perfluorohexanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0032 U		0.0080	0.0032	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0032 U		0.0080	0.0032	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	

## PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0032 U		0.0080	0.0032	0.0020	ug/l	

## PERFLUOROOCETANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.016 U		0.020	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U		0.020	0.016	0.0080	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
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13C2-PFHxA	84%			70-130%
13C2-PFDA	85%			70-130%
d5-EtFOSAA	86%			70-130%

(a) Associated BS recovery outside control limits.

U = Not detected      LOD = Limit of Detection  
MCL = Maximum Contamination Level (40 CFR 141)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

SGS North America Inc.

## Report of Analysis

Page 1 of 1

<b>Client Sample ID:</b>	DI BLANK	<b>Date Sampled:</b>	01/09/18
<b>Lab Sample ID:</b>	FA50819-4	<b>Date Received:</b>	01/11/18
<b>Matrix:</b>	DW - Drinking Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	EPA 537 EPA 537		
<b>Project:</b>	1189007		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q10263.D	1	01/17/18 17:07	NG	01/15/18 10:00	OP68362	S2Q194
Run #2							

	Initial Volume	Final Volume
Run #1	250 ml	1.0 ml
Run #2		

## Perfluorinated Alkyl Acids

CAS No.	Compound	Result	MCL	LOQ	LOD	DL	Units	Q
---------	----------	--------	-----	-----	-----	----	-------	---

## PERFLUOROALKYLCARBOXYLIC ACIDS

2706-90-3	Perfluoropentanoic acid <sup>a</sup>	0.0060 U		0.0080	0.0060	0.0040	ug/l	
307-24-4	Perfluorohexanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0032 U		0.0080	0.0032	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0032 U		0.0080	0.0032	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	

## PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0060 U		0.0080	0.0060	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0032 U		0.0080	0.0032	0.0020	ug/l	

## PERFLUOROOCATANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.016 U		0.020	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U		0.020	0.016	0.0080	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
---------	----------------------	--------	--------	--------

	13C2-PFHxA	84%		70-130%
	13C2-PFDA	83%		70-130%
	d5-EtFOSAA	85%		70-130%

(a) Associated BS recovery outside control limits.

U = Not detected      LOD = Limit of Detection  
MCL = Maximum Contamination Level (40 CFR 141)  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

**SGS****FA50819**

SGS North America Inc.  
CHAIN OF CUSTODY RECORD



## Locations Nationwide

Alaska Florida  
New Jersey Colorado  
Texas North Carolina  
Virginia Louisiana  
[www.us.sgs.com](http://www.us.sgs.com)

CLIENT: SGS North America Inc. - Alaska Division					SGS Reference: <b>SGS Orlando, FL</b>					Page 1 of 1																																																																																																																																																																																																																																																																				
CONTACT: Julie Shumway PHONE NO: (907) 562-2343					Additional Comments: All soils report out in dry weight unless otherwise requested.																																																																																																																																																																																																																																																																									
PROJECT NAME: 1189007 PWSID#: NPDL#: E-MAIL: Julie.Shumway@sgs.com					<table border="1"> <tr> <td rowspan="4">#</td> <td rowspan="4">Preservative Used:</td> <td rowspan="4">NOVIE</td> <td rowspan="4">PFAS per EPA 537</td> <td rowspan="4">MS</td> <td rowspan="4">MSD</td> <td rowspan="4">SGS lab #</td> <td rowspan="4">Loc ID</td> <td rowspan="4">REMARKS</td> </tr> <tr><td></td></tr> <tr><td></td></tr> <tr><td></td></tr> </table>										#	Preservative Used:	NOVIE	PFAS per EPA 537	MS	MSD	SGS lab #	Loc ID	REMARKS																																																																																																																																																																																																																																																							
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<table border="1"> <thead> <tr> <th>SAMPLE IDENTIFICATION</th> <th>DATE mm/dd/yy</th> <th>TIME HHMM</th> <th>MATRIX/MATRIX</th> <th>#</th> <th>GRAB</th> <th>X</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> </tr> </thead> <tbody> <tr> <td>1 P18-002-01</td> <td>1/5/2018</td> <td>1024</td> <td>DW</td> <td>2</td> <td>GRAB</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PS01 Pre-cl H2O Treatment Room</td> </tr> <tr> <td>2 P18-002-02</td> <td>1/4/2018</td> <td>1645</td> <td>DW</td> <td>2</td> <td>GRAB</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>MCCF#2 Plant Raw H2O Tk</td> </tr> <tr> <td>3 P18-002-03</td> <td>1/4/2018</td> <td>1810</td> <td>DW</td> <td>2</td> <td>GRAB</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>PS04 Tea Lake Well</td> </tr> <tr> <td>4 D.I. Blank</td> <td>1/9/2018</td> <td>1200</td> <td>DI W</td> <td>2</td> <td>GRAB</td> <td>X</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>SGS ANC</td> </tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>					SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/MATRIX	#	GRAB	X													1 P18-002-01	1/5/2018	1024	DW	2	GRAB	X												PS01 Pre-cl H2O Treatment Room	2 P18-002-02	1/4/2018	1645	DW	2	GRAB	X												MCCF#2 Plant Raw H2O Tk	3 P18-002-03	1/4/2018	1810	DW	2	GRAB	X												PS04 Tea Lake Well	4 D.I. Blank	1/9/2018	1200	DI W	2	GRAB	X												SGS ANC																																																																																																																																																																											
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Relinquished By: (1) <i>[Signature]</i> Date: 1/10/18 Time: 1121 Received By: UPS					DOD Project? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Report to DL (J Flags) <input type="checkbox"/> Cooler ID: Level 2 w/Excel EDD					Data Deliverable Requirements: Requested Turnaround Time and/or Special Instructions: Standard.																																																																																																																																																																																																																																																																				
Relinquished By: (2) <i>[Signature]</i> Date: Date: Time: Received By:					Temp Blank °C: 4.6 or Ambient [ ]					Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT																																																																																																																																																																																																																																																																				
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[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301  
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1550

1000

[http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm)

1189007\_PFAS\_1.10.18.xls

FA50819: Chain of Custody

Page 1 of 2

# SGS Sample Receipt Summary

Revised Report - Revision 2

Job Number: FA50819

Client: SGS

Project: 1189007

Date / Time Received: 1/11/2018 10:00:00 AM

Delivery Method: UPS

Airbill #: 1ZA8619W0164464118

Therm ID: IR 1;

Therm CF: 0.4;

# of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (4.2);

Cooler Temps (Corrected) °C: Cooler 1: (4.6);

## Cooler Information

Y or N

1. Custody Seals Present ☒ ☐
2. Custody Seals Intact ☒ ☐
3. Temp criteria achieved ☒ ☐
4. Cooler temp verification IR Gun
5. Cooler media Ice (Bag)

## Trip Blank Information

Y or N N/A

1. Trip Blank present / cooler ☐ ☐ ☒
  2. Trip Blank listed on COC ☐ ☐ ☒
- W or S N/A
3. Type Of TB Received ☐ ☐ ☒

## Sample Information

Y or N N/A

1. Sample labels present on bottles ☒ ☐
2. Samples preserved properly ☒ ☐
3. Sufficient volume/containers recvd for analysis: ☒ ☐
4. Condition of sample Intact
5. Sample recvd within HT ☒ ☐
6. Dates/Times/IDs on COC match Sample Label ☒ ☐
7. VOCs have headspace ☐ ☐ ☒
8. Bottles received for unspecified tests ☐ ☒ ☐
9. Compositing instructions clear ☐ ☐ ☒
10. Voa Soil Kits/Jars received past 48hrs? ☐ ☐ ☒
11. % Solids Jar received? ☐ ☐ ☒
12. Residual Chlorine Present? ☐ ☐ ☒

## Misc. Information

Number of Encores: 25-Gram \_\_\_\_\_ 5-Gram \_\_\_\_\_  
 Test Strip Lot #: pH 0-3 \_\_\_\_\_ 230315 \_\_\_\_\_  
 Residual Chlorine Test Strip Lot #: \_\_\_\_\_

Number of 5035 Field Kits: \_\_\_\_\_  
 pH 10-12 \_\_\_\_\_ 219813A \_\_\_\_\_

Number of Lab Filtered Metals: \_\_\_\_\_  
 Other: (Specify) \_\_\_\_\_

Comments

SM001  
Rev. Date 05/24/17

Technician: SHAYLAP

Date: 1/11/2018 10:00:00 A

Reviewer: P.H

Date: 1/11/2018

FA50819: Chain of Custody

Page 2 of 2

## MS Semi-volatiles

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## QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

**Method Blank Summary**

Page 1 of 1

**Job Number:** FA50819  
**Account:** SGS/KA SGS North America, Inc  
**Project:** 1189007

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP68362-MB	2Q10258.D	1	01/17/18	NG	01/15/18	OP68362	S2Q194

**The QC reported here applies to the following samples:****Method:** EPA 537

FA50819-1, FA50819-2, FA50819-3, FA50819-4

CAS No.	Compound	Result	RL	MDL	Units	Q
2706-90-3	Perfluoropentanoic acid	ND	0.0080	0.0040	ug/l	
307-24-4	Perfluorohexanoic acid	ND	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.0080	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.0080	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.0080	0.0040	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.0080	0.0020	ug/l	
2355-31-9	MeFOSAA	ND	0.020	0.0080	ug/l	
2991-50-6	EtFOSAA	ND	0.020	0.0080	ug/l	

CAS No.	Surrogate Recoveries	Limits
	13C2-PFHxA	102% 70-130%
	13C2-PFDA	98% 70-130%
	d5-EtFOSAA	95% 70-130%



**Blank Spike Summary**

Page 1 of 1

**Job Number:** FA50819  
**Account:** SGS/KA SGS North America, Inc  
**Project:** 1189007

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP68362-BS	2Q10257.D	1	01/17/18	NG	01/15/18	OP68362	S2Q194

**The QC reported here applies to the following samples:****Method:** EPA 537

FA50819-1, FA50819-2, FA50819-3, FA50819-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
2706-90-3	Perfluoropentanoic acid	0.08	0.0257	32*	70-130
307-24-4	Perfluorohexanoic acid	0.08	0.0906	113	70-130
375-85-9	Perfluoroheptanoic acid	0.08	0.0902	113	70-130
335-67-1	Perfluorooctanoic acid	0.08	0.0918	115	70-130
375-95-1	Perfluorononanoic acid	0.08	0.0908	114	70-130
335-76-2	Perfluorodecanoic acid	0.08	0.0841	105	70-130
2058-94-8	Perfluoroundecanoic acid	0.08	0.0907	113	70-130
307-55-1	Perfluorododecanoic acid	0.08	0.0854	107	70-130
72629-94-8	Perfluorotridecanoic acid	0.08	0.0781	98	70-130
376-06-7	Perfluorotetradecanoic acid	0.08	0.0812	102	70-130
375-73-5	Perfluorobutanesulfonic acid	0.08	0.0904	113	70-130
355-46-4	Perfluorohexanesulfonic acid	0.08	0.100	125	70-130
1763-23-1	Perfluorooctanesulfonic acid	0.08	0.0864	108	70-130
2355-31-9	MeFOSAA	0.08	0.0995	124	70-130
2991-50-6	EtFOSAA	0.08	0.100	125	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
	13C2-PFHxA	93%	70-130%
	13C2-PFDA	86%	70-130%
	d5-EtFOSAA	91%	70-130%

\* = Outside of Control Limits.

**Matrix Spike/Matrix Spike Duplicate Summary**

Page 1 of 1

**Job Number:** FA50819**Account:** SGS/KA SGS North America, Inc**Project:** 1189007

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP68362-MS	2Q10274.D	1	01/17/18	NG	01/15/18	OP68362	S2Q194
OP68362-MSD	2Q10275.D	1	01/17/18	NG	01/15/18	OP68362	S2Q194
FA50820-7	2Q10273.D	1	01/17/18	NG	01/15/18	OP68362	S2Q194

**The QC reported here applies to the following samples:****Method:** EPA 537

FA50819-1, FA50819-2, FA50819-3, FA50819-4

CAS No.	Compound	FA50820-7 ug/l	Spike Q ug/l	MS ug/l	MS %	Spike ug/l	MSD ug/l	MSD %	RPD	Limits Rec/RPD
2706-90-3	Perfluoropentanoic acid	0.0238	0.154	0.165	92	0.154	0.168	94	2	70-130/30
307-24-4	Perfluorohexanoic acid	0.0179	0.154	0.163	94	0.154	0.155	89	5	70-130/30
375-85-9	Perfluoroheptanoic acid	0.00826	0.154	0.162	100	0.154	0.152	93	6	70-130/30
335-67-1	Perfluorooctanoic acid	0.00557 J	0.154	0.168	106	0.154	0.158	99	6	70-130/30
375-95-1	Perfluorononanoic acid	ND	0.154	0.159	103	0.154	0.155	101	3	70-130/30
335-76-2	Perfluorodecanoic acid	ND	0.154	0.156	101	0.154	0.146	95	7	70-130/30
2058-94-8	Perfluoroundecanoic acid	ND	0.154	0.144	94	0.154	0.140	91	3	70-130/30
307-55-1	Perfluorododecanoic acid	ND	0.154	0.145	94	0.154	0.143	93	1	70-130/30
72629-94-8	Perfluorotridecanoic acid	ND	0.154	0.139	90	0.154	0.138	90	1	70-130/30
376-06-7	Perfluorotetradecanoic acid	ND	0.154	0.136	88	0.154	0.136	88	0	70-130/30
375-73-5	Perfluorobutanesulfonic acid	ND	0.154	0.145	94	0.154	0.141	92	3	70-130/30
355-46-4	Perfluorohexanesulfonic acid	0.0240	0.154	0.170	95	0.154	0.167	93	2	70-130/30
1763-23-1	Perfluorooctanesulfonic acid	ND	0.154	0.143	93	0.154	0.138	90	4	70-130/30
2355-31-9	MeFOSAA	ND	0.154	0.173	112	0.154	0.181	118	5	70-130/30
2991-50-6	EtFOSAA	ND	0.154	0.170	110	0.154	0.181	118	6	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	FA50820-7	Limits
	13C2-PFHxA	86%	82%	85%	70-130%
	13C2-PFDA	94%	90%	97%	70-130%
	d5-EtFOSAA	86%	90%	82%	70-130%

\* = Outside of Control Limits.

## **Laboratory Data Review Checklist**

Completed by:

Jennifer McLean

Title:

Associate Scientist

Date:

December 14, 2018

CS Report Name:

PS03 Drinking Water  
PFAS

Report Date:

November 09, 2018

Consultant Firm:

SLR International Corporation

Laboratory Name:

SGS North America, Inc., Anchorage

Laboratory Report Number:

1189007

ADEC File Number:

NA

Hazard Identification Number:

NA

1. Laboratory

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

☒ Yes ☐ No

Comments:

Samples were received at SGS, Fairbanks, then transferred by SGS, Fairbanks to SGS, Anchorage. SGS, Anchorage then transferred samples to SGS, Orlando, Florida, where all analysis were conducted.

- 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

Comments:

SGS Orlando maintains a current ADEC Contaminated Sites approval (number UST-088) and is Department of Defense Environmental Laboratory Accreditation Program Quality Services Manual 5.1 accredited for the analytical methods of interest, as applicable (Certificate #L2229).

2. Chain of Custody (COC)

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

☒ Yes ☐ No

Comments:

- b. Correct analyses requested?

☒ Yes ☐ No

Comments:

3. Laboratory Sample Receipt Documentation

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

☒ Yes ☐ No

Comments:

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

☒ Yes ☐ No

Comments:

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

☒ Yes ☐ No

Comments:

- 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

Comments:

Sample 1189007004, the D.I. Blank was "collected" at the SGS, Anchorage laboratory due to the absence of a field blank.

- e. Data quality or usability affected?

Comments:

While this does not replicate a true field blank, the intent was to monitor for possible contamination introduced during shipping from Anchorage, Alaska to Orlando, Florida. Samples 1189007002 and 1189007003 had results of non-detect for all PFAS analytes, indicating that no field contamination was present. Data was not impacted.

#### 4. Case Narrative

- a. Present and understandable?

☒ Yes ☐ No

Comments:

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

☐ Yes ☒ No

Comments:

Perfluoropentanoic acid recovered below the acceptable lower control limit in the LCS. This was not noted in the case narrative. Refer to 6biii for discussion.

- c. Were all corrective actions documented?

☐ Yes ☒ No

Comments:

No corrective actions were necessary.

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

Comments:

No impact.

#### 5. Samples Results

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

☒ Yes ☐ No

Comments:

- b. All applicable holding times met?

☒ Yes ☐ No

Comments:

c. All soils reported on a dry weight basis?

☒ Yes ☐ No

Comments:

Not applicable. Only water samples were analyzed.

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

☒ Yes ☐ No

Comments:

All results of non-detect had LODs below the levels listed in the ADEC Technical Memorandum, Action Levels for PFAS in Water and Guidance on Sampling Groundwater and Drinking Water (August 20, 2018).

e. Data quality or usability affected?

Comments:

No impact.

## 6. QC Samples

a. Method Blank

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

☒ Yes ☐ No

Comments:

ii. All method blank results less than limit of quantitation (LOQ)?

☒ Yes ☐ No

Comments:

iii. If above LOQ, what samples are affected?

Comments:

Not applicable.

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

☐ Yes ☒ No

Comments:

Not applicable.

v. Data quality or usability affected?

Comments:

No impact.



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 Comments:

An LCS and an MS/MSD were analyzed.

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

☒ Yes ☐ No Comments:

Not applicable.

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

☒ Yes ☐ No Comments:

With the exception noted below, yes.

Perfluoropentanoic acid recovered below the acceptable lower control limit in the LCS.

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

☒ Yes ☐ No Comments:

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

Comments:

Affected samples were P18-002-01, P18-002-02, P18-002-03, and the D.I. Blank.

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

☒ Yes ☐ No Comments:

Samples P18-002-01, P18-002-02, P18-002-03, and the D.I. Blank all had results of non-detectable for perfluoropentanoic acid. This data were flagged "UJ" to indicate that the analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

- vii. Data quality or usability affected?

Comments:

No ADEC cleanup levels currently exist for perfluoropentanoic acid. Data usability was not impacted.

c. Surrogates – Organics Only

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

☒ Yes ☐ No

Comments:

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

☒ Yes ☐ No

Comments:

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

☐ Yes ☒ No

Comments:

Not applicable. All surrogate recoveries were within acceptable limits.

iv. Data quality or usability affected?

Comments:

No impact.

d. Trip blank – Volatile analyses only (GRO, BTEX, Volatile Chlorinated Solvents, etc.): Water and Soil

i. One trip blank reported per matrix, analysis and cooler?

☒ Yes ☐ No

Comments:

Sample 1189007004, the D.I. Blank was "collected" at the SGS, Anchorage laboratory due to the absence of a field blank. This sample effectively served as a trip blank from SGS, Anchorage to SGS, Orlando. Refer to 3d and 3e for further discussion.

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

Comments:

Yes.

iii. All results less than LOQ?

☒ Yes ☐ No

Comments:

iv. If above LOQ, what samples are affected?

Comments:

Not applicable.

v. Data quality or usability affected?

Comments:

No impact.

e. Field Duplicate

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

☐ Yes ☒ No

Comments:

Samples were collected for internal use only and were not initially intended for reporting to regulatory agencies.

ii. Submitted blind to lab?

☐ Yes ☒ No

Comments:

Not applicable.

iii. Precision – All relative percent differences (RPD) less than specified DQOs?  
(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

Comments:

Not applicable.

iv. Data quality or usability affected?

Comments:

Field precision was not verified, but laboratory precision was acceptable for all analytes and sample results were all well below ADEC target levels. Data usability was not impacted.

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

☐ Yes ☐ No ☒ Not Applicable

i. All results less than LOQ?

☐ Yes ☒ No

Comments:

Not applicable.

ii. If above LOQ, what samples are affected?

Comments:

Not applicable.

iii. Data quality or usability affected?

Comments:

No impact.

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

a. Defined and appropriate?

☒ Yes   ☐ No

Comments: