



DEPARTMENT OF THE AIR FORCE
UNITED STATES SPACE FORCE
SPACE LAUNCH DELTA 45

29 August 2022

MEMORANDUM FOR RECORD

SUBJECT: Testing Drinking water at Ascension Island for perflourooctane Sulfate (PFOS) and Perfluorooctane Acid (PFOA)

1. Purpose: On 8 December 2021, four samples were taken from two reverse osmosis water purification units (ROWPUs) located on Ascension Island. The purpose of this sampling was to determine the levels of PFOS/PFOA in the system and ensure they are below the applicable health advisory limits.
2. Method: Sample method E537.1 was used to collect samples. BE was not able to perform the sampling due to Covid 19 restrictions. The testing equipment and testing procedures were sent to Ascension Island (bldg. 945) and was performed by environmental specialists, Robert Yon and Romeo Andaya: romeo.andaya.ctr.ph@spaceforce.mil, robert.yon.ctr.gb@spaceforce.mil.
3. Results: All of the results came back as non-detect/ below the acceptable limits. The table below shows the following results for PSOF/PFOA samples analyzed for Ascension Island. The rest of the Lab sample results can be found in attachment 1.

Lab Sample ID	Client Sample ID	Collection date	Analysis Date	PFOS Results	PFOA Results
21121432-01	0000WWJ5 - Before ROWPU Sample W2112090-01A	12/8/2021 15:43	12/15/2021 09:30	U*	U
21121432-03	0000WWJI - After ROWPU Sample (FTB) W2112090-02A	12/8/2021 15:52	12/15/2021 09:30	U	U
21121432-04	0000WWJ6 - Before ROWPU Sample (FTB) W2112090-03A	12/8/2021 15:43	12/15/2021 09:30	U	U
21121432-05	0000WWJH - After ROWPU Sample W2112090-04A	12/8/2021 15:52	12/15/2021 09:30	U	U

*Analyzed but not detected above the Method Detection Limit (MDL).

4. Follow-up: No follow up actions required.

KEVIN A. MOY, Capt, USAF, BSC
Bioenvironmental Flight Commander

Attachment:

1. PFAS Results 21121432 Patrick SFB FA2396-21-F-0029-04



27-Jan-2022

Jennifer Patrick
USAFSAM/OEA
2510 Fifth Street
Bldg 20840, Room W327
Wright Patterson AFB, OH 45433

Re: **Patrick Space Force Base FA2396-21-F-0029-041**

Work Order: **21121432**

Dear Jennifer,

ALS Environmental received 4 samples on 15-Dec-2021 09:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 17.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

A handwritten signature in black ink, appearing to read "Bill Carey".

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

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Environmental 

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RIGHT SOLUTIONS RIGHT PARTNER

Client: USAFSAM/OEA
Project: Patrick Space Force Base FA2396-21-F-0029-041
Work Order: 21121432

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
21121432-01	0000WWJ5 - Before ROWPU Sample W2112090-01A	Drinking Wat	W2112090-01A	12/8/2021 15:43	12/15/2021 09:30	☐
21121432-03	0000WWJI - After ROWPU Sample (FTB) W2112090-02A	Water	W2112090-02A	12/8/2021 15:52	12/15/2021 09:30	☐
21121432-04	0000WWJ6 - Before ROWPU Sample (FTB) W2112090-03A	Water	W2112090-03A	12/8/2021 15:43	12/15/2021 09:30	☐
21121432-05	0000WWJH - After ROWPU Sample W2112090-04A	Drinking Wat	W2112090-04A	12/8/2021 15:52	12/15/2021 09:30	☐

Client: USAFSAM/OEA
Project: Patrick Space Force Base FA2396-21-F-0029-041
WorkOrder: 21121432

QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
ng/L	Nanograms per Liter

Client: USAFSAM/OEA
Project: Patrick Space Force Base FA2396-21-F-0029-041
Work Order: 21121432

Case Narrative

Samples for the above noted Work Order were received on 12/15/2021. The attached "Sample Receipt Checklist" documents the status of custody seals, container integrity, preservation, and temperature compliance.

Samples were analyzed according to the analytical methodology previously transmitted in the "Work Order Acknowledgement". Methodologies are also documented in the "Analytical Result" section for each sample. Quality control results are listed in the "QC Report" section. Sample association for the reported quality control is located at the end of each batch summary. If applicable, results are appropriately qualified in the Analytical Result and QC Report sections. The "Qualifiers" section documents the various qualifiers, units, and acronyms utilized in reporting. A copy of the laboratory's scope of accreditation is available upon request.

With the following exceptions, all sample analyses achieved analytical criteria.

Extractable Organics:

No other deviations or anomalies were noted.

ALS Group, USA

Date: 27-Jan-22

Client: USAFSAM/OEA
Project: Patrick Space Force Base FA2396-21-F-0029-041
Sample ID: 0000WWJ5 - Before ROWPU Sample W2112090-01A
Collection Date: 12/8/2021 03:43 PM

Work Order: 21121432
Lab ID: 21121432-01
Matrix: DRINKING WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PFAS BY EPA 537.1		Method: E537.1		Prep: E537.1 / 12/17/21		Analyst: AK	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	U		0.6	2	ng/L	1	12/17/2021 18:52
N-Ethylperfluorooctanesulfonamidoacetic Acid	U		0.3	2	ng/L	1	12/17/2021 18:52
N-Methylperfluorooctanesulfonamidoacetic Acid	U		0.5	2	ng/L	1	12/17/2021 18:52
Perfluorobutanesulfonic Acid (PFBS)	U		0.3	2	ng/L	1	12/17/2021 18:52
Perfluorodecanoic Acid (PFDA)	U		0.7	2	ng/L	1	12/17/2021 18:52
Perfluorododecanoic Acid (PFDoA)	U		0.4	2	ng/L	1	12/17/2021 18:52
Perfluoroheptanoic Acid (PFHpA)	U		0.5	2	ng/L	1	12/17/2021 18:52
Perfluorohexanesulfonic Acid (PFHxS)	U		0.3	2	ng/L	1	12/17/2021 18:52
Perfluorohexanoic Acid (PFHxA)	0.84	J	0.6	2	ng/L	1	12/17/2021 18:52
Perfluorononanoic Acid (PFNA)	U		0.5	2	ng/L	1	12/17/2021 18:52
Perfluorooctanesulfonic Acid (PFOS)	U		0.2	2	ng/L	1	12/17/2021 18:52
Perfluorooctanoic Acid (PFOA)	U		0.5	2	ng/L	1	12/17/2021 18:52
Perfluorotetradecanoic Acid (PFTeA)	U		0.5	2	ng/L	1	12/17/2021 18:52
Perfluorotridecanoic Acid (PFTriA)	U		0.3	2	ng/L	1	12/17/2021 18:52
Perfluoroundecanoic Acid (PFUnA)	U		0.4	2	ng/L	1	12/17/2021 18:52
11Cl-Pf3OUdS	U		0.4	2	ng/L	1	12/17/2021 18:52
9Cl-PF3ONS	U		0.2	2	ng/L	1	12/17/2021 18:52
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	U		0.3	2	ng/L	1	12/17/2021 18:52
Surr: 13C2-PFHxA	128			70-130	%REC	1	12/17/2021 18:52
Surr: 13C2-PFDA	100			70-130	%REC	1	12/17/2021 18:52
Surr: d5-N-EtFOSAA	89.2			70-130	%REC	1	12/17/2021 18:52
Surr: 13C3-HFPO-DA	123			70-130	%REC	1	12/17/2021 18:52

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 27-Jan-22

Client: USAFSAM/OEA
Project: Patrick Space Force Base FA2396-21-F-0029-041
Sample ID: 0000WWJI - After ROWPU Sample (FTB) W2112090-02A
Collection Date: 12/8/2021 03:52 PM

Work Order: 21121432
Lab ID: 21121432-03
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PFAS BY EPA 537.1		Method: E537.1		Prep: E537.1 / 12/17/21		Analyst: AK	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	U		0.6	2	ng/L	1	12/17/2021 19:00
N-Ethylperfluorooctanesulfonamidoacetic Acid	U		0.3	2	ng/L	1	12/17/2021 19:00
N-Methylperfluorooctanesulfonamidoacetic Acid	U		0.4	2	ng/L	1	12/17/2021 19:00
Perfluorobutanesulfonic Acid (PFBS)	U		0.3	2	ng/L	1	12/17/2021 19:00
Perfluorodecanoic Acid (PFDA)	U		0.6	2	ng/L	1	12/17/2021 19:00
Perfluorododecanoic Acid (PFDoA)	U		0.3	2	ng/L	1	12/17/2021 19:00
Perfluoroheptanoic Acid (PFHpA)	U		0.5	2	ng/L	1	12/17/2021 19:00
Perfluorohexanesulfonic Acid (PFHxS)	U		0.3	2	ng/L	1	12/17/2021 19:00
Perfluorohexanoic Acid (PFHxA)	U		0.6	2	ng/L	1	12/17/2021 19:00
Perfluorononanoic Acid (PFNA)	U		0.5	2	ng/L	1	12/17/2021 19:00
Perfluorooctanesulfonic Acid (PFOS)	U		0.2	2	ng/L	1	12/17/2021 19:00
Perfluorooctanoic Acid (PFOA)	U		0.5	2	ng/L	1	12/17/2021 19:00
Perfluorotetradecanoic Acid (PFTeA)	U		0.4	2	ng/L	1	12/17/2021 19:00
Perfluorotridecanoic Acid (PFTriA)	U		0.3	2	ng/L	1	12/17/2021 19:00
Perfluoroundecanoic Acid (PFUnA)	U		0.4	2	ng/L	1	12/17/2021 19:00
11Cl-Pf3OUdS	U		0.3	2	ng/L	1	12/17/2021 19:00
9Cl-PF3ONS	U		0.1	2	ng/L	1	12/17/2021 19:00
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	U		0.3	2	ng/L	1	12/17/2021 19:00
Surr: 13C2-PFHxA	107			70-130	%REC	1	12/17/2021 19:00
Surr: 13C2-PFDA	107			70-130	%REC	1	12/17/2021 19:00
Surr: d5-N-EtFOSAA	98.3			70-130	%REC	1	12/17/2021 19:00
Surr: 13C3-HFPO-DA	104			70-130	%REC	1	12/17/2021 19:00

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 27-Jan-22

Client: USAFSAM/OEA
Project: Patrick Space Force Base FA2396-21-F-0029-041
Sample ID: 0000WWJ6 - Before ROWPU Sample (FTB) W2112090-
Collection Date: 12/8/2021 03:43 PM

Work Order: 21121432
Lab ID: 21121432-04
Matrix: WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PFAS BY EPA 537.1			Method: E537.1		Prep: E537.1 / 12/17/21		Analyst: AK
Hexafluoropropylene oxide dimer acid (HFPO-DA)	U		0.6	2	ng/L	1	12/17/2021 19:08
N-Ethylperfluorooctanesulfonamidoacetic Acid	U		0.3	2	ng/L	1	12/17/2021 19:08
N-Methylperfluorooctanesulfonamidoacetic Acid	U		0.4	2	ng/L	1	12/17/2021 19:08
Perfluorobutanesulfonic Acid (PFBS)	U		0.3	2	ng/L	1	12/17/2021 19:08
Perfluorodecanoic Acid (PFDA)	U		0.6	2	ng/L	1	12/17/2021 19:08
Perfluorododecanoic Acid (PFDoA)	U		0.3	2	ng/L	1	12/17/2021 19:08
Perfluoroheptanoic Acid (PFHpA)	U		0.5	2	ng/L	1	12/17/2021 19:08
Perfluorohexanesulfonic Acid (PFHxS)	U		0.3	2	ng/L	1	12/17/2021 19:08
Perfluorohexanoic Acid (PFHxA)	U		0.6	2	ng/L	1	12/17/2021 19:08
Perfluorononanoic Acid (PFNA)	U		0.5	2	ng/L	1	12/17/2021 19:08
Perfluorooctanesulfonic Acid (PFOS)	U		0.2	2	ng/L	1	12/17/2021 19:08
Perfluorooctanoic Acid (PFOA)	U		0.5	2	ng/L	1	12/17/2021 19:08
Perfluorotetradecanoic Acid (PFTeA)	U		0.4	2	ng/L	1	12/17/2021 19:08
Perfluorotridecanoic Acid (PFTriA)	U		0.3	2	ng/L	1	12/17/2021 19:08
Perfluoroundecanoic Acid (PFUnA)	U		0.4	2	ng/L	1	12/17/2021 19:08
11Cl-Pf3OUdS	U		0.3	2	ng/L	1	12/17/2021 19:08
9Cl-PF3ONS	U		0.1	2	ng/L	1	12/17/2021 19:08
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	U		0.3	2	ng/L	1	12/17/2021 19:08
Surr: 13C2-PFHxA	102			70-130	%REC	1	12/17/2021 19:08
Surr: 13C2-PFDA	96.9			70-130	%REC	1	12/17/2021 19:08
Surr: d5-N-EtFOSAA	93.0			70-130	%REC	1	12/17/2021 19:08
Surr: 13C3-HFPO-DA	100			70-130	%REC	1	12/17/2021 19:08

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 27-Jan-22

Client: USAFSAM/OEA
Project: Patrick Space Force Base FA2396-21-F-0029-041
Sample ID: 0000WWJH - After ROWPU Sample W2112090-04A
Collection Date: 12/8/2021 03:52 PM

Work Order: 21121432
Lab ID: 21121432-05
Matrix: DRINKING WATER

Analyses	Result	Qual	MDL	Report Limit	Units	Dilution Factor	Date Analyzed
PFAS BY EPA 537.1		Method: E537.1		Prep: E537.1 / 12/17/21		Analyst: AK	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	U		0.6	2	ng/L	1	12/17/2021 19:17
N-Ethylperfluorooctanesulfonamidoacetic Acid	U		0.3	2	ng/L	1	12/17/2021 19:17
N-Methylperfluorooctanesulfonamidoacetic Acid	U		0.5	2	ng/L	1	12/17/2021 19:17
Perfluorobutanesulfonic Acid (PFBS)	U		0.3	2	ng/L	1	12/17/2021 19:17
Perfluorodecanoic Acid (PFDA)	U		0.6	2	ng/L	1	12/17/2021 19:17
Perfluorododecanoic Acid (PFDoA)	U		0.3	2	ng/L	1	12/17/2021 19:17
Perfluoroheptanoic Acid (PFHpA)	U		0.5	2	ng/L	1	12/17/2021 19:17
Perfluorohexanesulfonic Acid (PFHxS)	U		0.3	2	ng/L	1	12/17/2021 19:17
Perfluorohexanoic Acid (PFHxA)	U		0.6	2	ng/L	1	12/17/2021 19:17
Perfluorononanoic Acid (PFNA)	U		0.5	2	ng/L	1	12/17/2021 19:17
Perfluorooctanesulfonic Acid (PFOS)	U		0.2	2	ng/L	1	12/17/2021 19:17
Perfluorooctanoic Acid (PFOA)	U		0.5	2	ng/L	1	12/17/2021 19:17
Perfluorotetradecanoic Acid (PFTeA)	U		0.5	2	ng/L	1	12/17/2021 19:17
Perfluorotridecanoic Acid (PFTriA)	U		0.3	2	ng/L	1	12/17/2021 19:17
Perfluoroundecanoic Acid (PFUnA)	U		0.4	2	ng/L	1	12/17/2021 19:17
11Cl-Pf3OUdS	U		0.4	2	ng/L	1	12/17/2021 19:17
9Cl-PF3ONS	U		0.2	2	ng/L	1	12/17/2021 19:17
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	U		0.3	2	ng/L	1	12/17/2021 19:17
Surr: 13C2-PFHxA	118			70-130	%REC	1	12/17/2021 19:17
Surr: 13C2-PFDA	117			70-130	%REC	1	12/17/2021 19:17
Surr: d5-N-EtFOSAA	103			70-130	%REC	1	12/17/2021 19:17
Surr: 13C3-HFPO-DA	114			70-130	%REC	1	12/17/2021 19:17

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: USAFSAM/OEA

QC BATCH REPORT

Work Order: 21121432

Project: Patrick Space Force Base FA2396-21-F-0029-041

Batch ID: 189085

Instrument ID LCMS1

Method: E537.1

MBLK		Sample ID: MBLK-189085-189085				Units: ng/L		Analysis Date: 12/17/2021 06:19 PM		
Client ID:		Run ID: LCMS1_211217B				SeqNo: 8044157		Prep Date: 12/17/2021		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hexafluoropropylene oxide dimer acid	U	2.0								
N-Ethylperfluorooctanesulfonamidoac	U	2.0								
N-Methylperfluorooctanesulfonamidoa	U	2.0								
Perfluorobutanesulfonic Acid (PFBS)	U	2.0								
Perfluorodecanoic Acid (PFDA)	U	2.0								
Perfluorododecanoic Acid (PFDoA)	U	2.0								
Perfluoroheptanoic Acid (PFHpA)	U	2.0								
Perfluorohexanesulfonic Acid (PFHxS)	U	2.0								
Perfluorohexanoic Acid (PFHxA)	U	2.0								
Perfluorononanoic Acid (PFNA)	U	2.0								
Perfluorooctanesulfonic Acid (PFOS)	U	2.0								
Perfluorooctanoic Acid (PFOA)	U	2.0								
Perfluorotetradecanoic Acid (PFTeA)	U	2.0								
Perfluorotridecanoic Acid (PFTriA)	U	2.0								
Perfluoroundecanoic Acid (PFUnA)	U	2.0								
11Cl-Pf3OUdS	U	2.0								
9Cl-PF3ONS	U	2.0								
4,8-Dioxa-3H-perfluorononanoic Acid (	U	2.0								
Surr: 13C2-PFHxA	44.49	0	40	0	111	70-130	0			
Surr: 13C2-PFDA	39.08	0	40	0	97.7	70-130	0			
Surr: d5-N-EtFOSAA	162.8	0	160	0	102	70-130	0			
Surr: 13C3-HFPO-DA	41.61	0	40	0	104	70-130	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: USAFSAM/OEA
 Work Order: 21121432
 Project: Patrick Space Force Base FA2396-21-F-0029-041

QC BATCH REPORT

Batch ID: **189085** Instrument ID **LCMS1** Method: **E537.1**

MS2				Sample ID: 21121104-03A MS2			Units: ng/L		Analysis Date: 12/17/2021 06:36 PM	
Client ID:		Run ID: LCMS1_211217B			SeqNo: 8044159		Prep Date: 12/17/2021		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hexafluoropropylene oxide dimer acid	18.24	2.0	17.01	0	107	70-130	0			
N-Ethylperfluorooctanesulfonamidoac	13.05	2.0	17.01	0	76.8	70-130	0			
N-Methylperfluorooctanesulfonamidoa	12.98	2.0	17.01	0	76.3	70-130	0			
Perfluorobutanesulfonic Acid (PFBS)	13.82	2.0	15.03	0.735	87	70-130	0			
Perfluorodecanoic Acid (PFDA)	16.63	2.0	17.01	0.617	94.2	70-130	0			
Perfluorododecanoic Acid (PFDoA)	16.96	2.0	17.01	0	99.7	70-130	0			
Perfluoroheptanoic Acid (PFHpA)	24.15	2.0	17.01	6.447	104	70-130	0			
Perfluorohexanesulfonic Acid (PFHxS)	14.5	2.0	15.48	1.365	84.9	70-130	0			
Perfluorohexanoic Acid (PFHxA)	23.9	2.0	17.01	3.892	118	70-130	0			
Perfluorononanoic Acid (PFNA)	28.88	2.0	17.01	7.927	123	70-130	0			
Perfluorooctanesulfonic Acid (PFOS)	17.23	2.0	15.78	4.565	80.2	70-130	0			
Perfluorooctanoic Acid (PFOA)	20.96	2.0	17.01	6.191	86.9	70-130	0			
Perfluorotetradecanoic Acid (PFTeA)	16.9	2.0	17.01	0	99.4	70-130	0			
Perfluorotridecanoic Acid (PFTriA)	16.11	2.0	17.01	0	94.7	70-130	0			
Perfluoroundecanoic Acid (PFUnA)	17.88	2.0	17.01	0.9837	99.4	70-130	0			
11Cl-Pf3OUdS	12.16	2.0	16.02	0	75.9	70-130	0			
9Cl-PF3ONS	12.75	2.0	15.85	0	80.4	70-130	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	18.91	2.0	16.02	0	118	70-130	0			
Surr: 13C2-PFHxA	43.57	0	34.01	0	128	70-130	0			
Surr: 13C2-PFDA	37.2	0	34.01	0	109	70-130	0			
Surr: d5-N-EtFOSAA	107	0	136.1	0	78.7	70-130	0			
Surr: 13C3-HFPO-DA	43.67	0	34.01	0	128	70-130	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: USAFSAM/OEA
 Work Order: 21121432
 Project: Patrick Space Force Base FA2396-21-F-0029-041

QC BATCH REPORT

Batch ID: **189085** Instrument ID **LCMS1** Method: **E537.1**

DUP				Sample ID: 21120864-03A DUP		Units: ng/L		Analysis Date: 12/17/2021 06:44 PM		
Client ID:		Run ID: LCMS1_211217B			SeqNo: 8044160		Prep Date: 12/17/2021		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hexafluoropropylene oxide dimer acid	U	2.0	0	0	0		0	0	30	
N-Ethylperfluorooctanesulfonamidoac	U	2.0	0	0	0		0	0	30	
N-Methylperfluorooctanesulfonamidoa	U	2.0	0	0	0		0	0	30	
Perfluorobutanesulfonic Acid (PFBS)	0.833	2.0	0	0	0		0.7815	0	30	J
Perfluorodecanoic Acid (PFDA)	U	2.0	0	0	0		0	0	30	
Perfluorododecanoic Acid (PFDoA)	U	2.0	0	0	0		0	0	30	
Perfluoroheptanoic Acid (PFHpA)	0.8404	2.0	0	0	0		0.848	0	30	J
Perfluorohexanesulfonic Acid (PFHxS)	U	2.0	0	0	0		0	0	30	
Perfluorohexanoic Acid (PFHxA)	0.8046	2.0	0	0	0		0.6883	0	30	J
Perfluorononanoic Acid (PFNA)	U	2.0	0	0	0		0	0	30	
Perfluorooctanesulfonic Acid (PFOS)	0.5241	2.0	0	0	0		0.5391	0	30	J
Perfluorooctanoic Acid (PFOA)	0.6117	2.0	0	0	0		0.673	0	30	J
Perfluorotetradecanoic Acid (PFTeA)	U	2.0	0	0	0		0	0	30	
Perfluorotridecanoic Acid (PFTriA)	U	2.0	0	0	0		0	0	30	
Perfluoroundecanoic Acid (PFUnA)	U	2.0	0	0	0		0	0	30	
11Cl-Pf3OUdS	U	2.0	0	0	0		0	0	30	
9Cl-PF3ONS	U	2.0	0	0	0		0	0	30	
4,8-Dioxa-3H-perfluorononanoic Acid (	U	2.0	0	0	0		0	0	30	
Surr: 13C2-PFHxA	35.11	0	35.46	0	99	70-130	33.2	5.59	30	
Surr: 13C2-PFDA	31.78	0	35.46	0	89.6	70-130	34.33	7.7	30	
Surr: d5-N-EtFOSAA	118	0	141.8	0	83.2	70-130	120.1	1.77	30	
Surr: 13C3-HFPO-DA	34.51	0	35.46	0	97.3	70-130	41.15	17.6	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: USAFSAM/OEA
 Work Order: 21121432
 Project: Patrick Space Force Base FA2396-21-F-0029-041

QC BATCH REPORT

Batch ID: **189085** Instrument ID **LCMS1** Method: **E537.1**

LCS2 Sample ID: LCS2-189085-189085				Units: ng/L		Analysis Date: 12/17/2021 06:27 PM				
Client ID:		Run ID: LCMS1_211217B		SeqNo: 8044158		Prep Date: 12/17/2021		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Hexafluoropropylene oxide dimer acid	20.85	2.0	20	0	104	70-130	0			
N-Ethylperfluorooctanesulfonamidoac	20.11	2.0	20	0	101	70-130	0			
N-Methylperfluorooctanesulfonamidoa	20.67	2.0	20	0	103	70-130	0			
Perfluorobutanesulfonic Acid (PFBS)	18.21	2.0	17.68	0	103	70-130	0			
Perfluorodecanoic Acid (PFDA)	20.18	2.0	20	0	101	70-130	0			
Perfluorododecanoic Acid (PFDoA)	21.66	2.0	20	0	108	70-130	0			
Perfluoroheptanoic Acid (PFHpA)	24.61	2.0	20	0	123	70-130	0			
Perfluorohexanesulfonic Acid (PFHxS)	18.19	2.0	18.2	0	99.9	70-130	0			
Perfluorohexanoic Acid (PFHxA)	22.59	2.0	20	0	113	70-130	0			
Perfluorononanoic Acid (PFNA)	24.85	2.0	20	0	124	70-130	0			
Perfluorooctanesulfonic Acid (PFOS)	18	2.0	18.56	0	97	70-130	0			
Perfluorooctanoic Acid (PFOA)	19.69	2.0	20	0	98.5	70-130	0			
Perfluorotetradecanoic Acid (PFTeA)	20.67	2.0	20	0	103	70-130	0			
Perfluorotridecanoic Acid (PFTriA)	19.35	2.0	20	0	96.7	70-130	0			
Perfluoroundecanoic Acid (PFUnA)	21.13	2.0	20	0	106	70-130	0			
11Cl-Pf3OUdS	18.61	2.0	18.84	0	98.8	70-130	0			
9Cl-PF3ONS	18.52	2.0	18.64	0	99.4	70-130	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	21.31	2.0	18.84	0	113	70-130	0			
Surr: 13C2-PFHxA	46.36	0	40	0	116	70-130	0			
Surr: 13C2-PFDA	43.92	0	40	0	110	70-130	0			
Surr: d5-N-EtFOSAA	153	0	160	0	95.6	70-130	0			
Surr: 13C3-HFPO-DA	45.18	0	40	0	113	70-130	0			

The following samples were analyzed in this batch:

21121432-01A	21121432-03A	21121432-04A
21121432-05A		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.



ALS Environmental
3352 128th Avenue
Holland, Michigan 49424
(Tel) 616.399.6070
(Fax) 616.399.6185

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Chain of Custody Record

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:Form No. CA-C-WI-002, Rev. 4.15, dated 9/27/2017

REQUISITION AND INVOICE/SHIPPING DOCUMENT

1. FROM: (Include ZIP Code) FY7898 WCFS INC AAF ENVIRONMENTAL TECHNICIAN ASCENSION AAF SOUTH ATLANTIC OCEAN, PH: 962-2949		SHEET NO. 1		NO. OF SHEETS 1		6. REQUISITION DATE		6. REQUISITION NUMBER FY78981342X011XXX	
2. TO: (Include ZIP Code) FY3968 WCFS INC TRANSPORTATION BUILDING 945 PATRICK AFB, FLORIDA 32925		7. DATE MATERIAL REQUIRED (YYYYMMDD)		8. PRIORITY TP-01					
3. SHIP TO - MARK FOR MARK FOR: JEFFREY MAQUINDANG PHONE: (321) 494-6434		9. AUTHORITY OR PURPOSE FA2521-15-C-0063		10. SIGNATURE YON.ROBERT.DAVE E.1296894440 Digitally signed by YON.ROBERT.DAVE Date: 2011.12.08 12:56:42 Z		11a. VOUCHER NUMBER & DATE (YYYYMMDD) Robert D Yon			
4. APPROPRIATIONS DATA		12. DATE SHIPPED (YYYYMMDD) 20211209		13. MODE OF SHIPMENT AIR/AMC		14. BILL OF LADING NUMBER WCFS INC, ASI, PH:962-2949			
15. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO. 837XL13428010		16. AIR MOVEMENT DESIGNATOR OR PORT REFERENCE NO.		17. SPECIAL HANDLING BY		AMOUNT			

ITEM NO. (a)	FEDERAL STOCK NUMBER, DESCRIPTION, AND CODING OF MATERIEL AND/OR SERVICES (b)	UNIT OF ISSUE (c)	QUANTITY REQUESTED (d)	SUPPLY ACTION (e)	TYPE OF CONTAINER (f)	CONTAINER NOS. (g)	UNIT PRICE (h)	TOTAL COST (i)
	One cooler containing samples for Bio Environmental for laboratory analysis. /////////////////LAST ITEM///////////////// I certify that this shipment does not contain any classified, sensitive, protective or hazardous cargo as defined per DOD regulation.	CO	1	1	CO			\$0.00
								\$0.00
								\$0.00
								\$0.00
								\$0.00

16. TRANSPORTATION VIA AMC OR MSC CHARGEABLE TO TAC: FXAT		17. SPECIAL HANDLING BY	
ISSUED BY Robert D Yon YON.ROBERT.DAVE E.1296894440 Digitally signed by YON.ROBERT.DAVE Date: 2011.12.08 12:56:42 Z		18. CONTAINERS RECEIVED EXCEPT AS NOTED DATE (YYYYMMDD)	
CHECKED BY		19. QUANTITIES RECEIVED EXCEPT AS NOTED DATE (YYYYMMDD)	
PACKED BY Robert D Yon YON.ROBERT.DAVE E.1296894440 Digitally signed by YON.ROBERT.DAVE Date: 2011.12.08 12:56:42 Z		20. RECEIVER'S VOUCHER NO.	

Page 1 of 1

Customer Information				Project Information				ALS Project Manager:				ALS Work Order #:					
Purchase Order		Project Name		USAF PFAS Sampling		A		Parameter/Method Request for Analysis									
Work Order		Project Number		PWS ID for Site Sampled		B											
Company Name		Patrick Space Force Base		USAFSAM/OEA - Analytical Services		C											
Send Report To		austin.pero.mil@mail.mil		Holly Slack/Jennifer Patrick		D											
Address		1366 New Mace Road		2510 Fifth St., Bldg. 20840		E											
		Patrick SFB, FL, 32925				F											
City/State/Zip		Patrick SFB, FL, 32925		Wright Patterson AFB, OH 45433		G											
Phone		321-494-5435		(937) 938-3435		H											
Fax						I											
e-Mail Address		william.n.lebright.mil@mail.mil				J											
No.	Sample Description	Date	Time	Matrix	Pres. Key Numbers	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	0000WWJ5 Before ROWPU Sample	12/8/2021	1543	DW	7	2	X										
2	0000WWJ6 Before ROWPU Sample (FTB)	12/8/2021	1543	RW	7	2	X										
3	0000WWJH After ROWPU Sample	12/8/2021	1552	DW	7	2	X										
4	0000WWJI After ROWPU Sample (FTB)	12/8/2021	1552	RW	7	2	X										
5																	
6																	
Sampler(s): Please Print & Sign		Shipment Method:		Turnaround Time: (Business Days)		Results Due Date:											
Robert Yon				☐ 10 BD ☐ 5 BD ☐ 3 BD ☐ 1 BD		☒ Other <u>15 BD</u>											
Relinquished by:		Received by:		Date:		Time:		Notes:									
2Lt Austin Pero		12/14/2021		0946													
Relinquished by:		Received by (Laboratory):		Date:		Time:		ALS Cooler ID		Cooler Temp		QC Package: (Check Box Below)					
Logged by (Laboratory):		Date:		Time:								☒ Level II: Standard QC ☐ Level III: Raw Data					
		Date:		Time:								☐ TRRP LRC ☐ TRRP Level IV					
		Date:		Time:								☐ Level IV: SW846 Methods/CLP like					
		Date:		Time:								☐ Other: _____					
Preservative Key: 1-HCl 2-HNO ₃ 3-H ₂ SO ₄ 4-NaOH 5-Na ₂ S ₂ O ₃ 6-NaHSO ₄ 7-Other		8-4°C		Note: Any changes must be made in writing once samples and COC Form have been submitted to ALS.													
Revision 2 - Effective 11/9/2016																	
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Sample Receipt Checklist

Client Name: USAFSAM/OEA

Date/Time Received: 15-Dec-21 09:30

Work Order: 21121432

Received by: KRW

Checklist completed by Keith Wurenga
eSignature

16-Dec-21
Date

Reviewed by: Bill Carey
eSignature

17-Dec-21
Date

Matrices: Water

Carrier name: FedEx

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Sample(s) received on ice? Yes ☒ No ☐

Temperature(s)/Thermometer(s): 3.1/4.1 C IR3

Cooler(s)/Kit(s):

Date/Time sample(s) sent to storage: 12/16/2021 12:00:46 PM

Water - VOA vials have zero headspace? Yes ☐ No ☐ No VOA vials submitted ☒

Water - pH acceptable upon receipt? Yes ☒ No ☐ N/A ☐

pH adjusted? Yes ☐ No ☒ N/A ☐

pH adjusted by:

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: