DATA VALIDATION REPORT

Red Hill Bulk Fuel Storage Facility
Joint Base Pearl Harbor-Hickam
CV 23F0104

SDG: 23C0204
APPL, INC.

Prepared by

ENVIRONMENTAL DATA SERVICES, LTD.

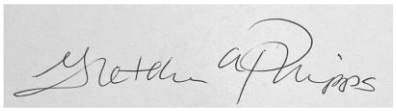
Prepared for

AECOM Environmental

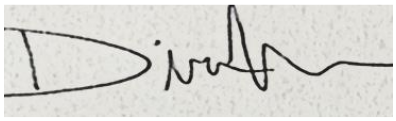
Revised Report Released: 4/24/23

Data Validators and Peer Reviewers:

Diane Waldschmidt



Gretchen Phipps



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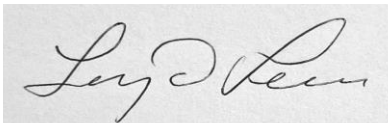

Larry Lewis

Paloma Hoelzle

5 Brilliant Avenue, Pittsburgh, PA 15215
412.408.3288 I www.eds-pa.com

ENVIRONMENTAL DATA SERVICES, LTD.

EXECUTIVE NARRATIVE

Sample Delivery Group: 23C0204
Laboratory: APPL, Inc.
Site: Red Hill Bulk Storage Facility, CV 23F0104
Sampling dates: 3/20/2023
Number of Samples: 5
Test Method: USEPA Method 1633
Analysis: per- and polyfluoroalkyl substances (PFAS)

Quality Assurance Project Plan: Sampling and Analysis Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility, Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i (Revision 01, April 2017); PFAS-Specific Sampling and Analysis plan, Red Hill Bulk Fuel Storage Facility, Adit 6, Joint Base Pearl Harbor-Hickam, O'Ahu, Hawai'i (November 30, 2022) (SAP).

Validation Guidelines: United States Department of Defense Data Validation Guidelines Module 6: Data Validation Procedure for Per- and Polyfluoroalkyl Substances analysis by QSM Table B-24, Environmental Data Quality Workgroup, October 18, 2022; United States Department of Defense (DOD) Environmental Data Quality Workgroup (EDQW), General Validation Guidelines, November 2019.

Client Sample Identification	Laboratory Sample Identification	Matrix	Validation Stage
AF-RHMW16-WGN01LF-2303W3	23C0204-01	aqueous	S2BVEM
AF-RHMW12A-WGN01LF-2303W3	23C0204-02	aqueous	S2BVEM
AF-RHMW12A-WGFD01LF-2303W3	23C0204-03	aqueous	S2BVEM
AF-RHMW06-WGN01LF-2303W3	23C0204-04	aqueous	S2BVEM
AF-RHMW04-WGN01LF-2303W3	23C0204-05	aqueous	S2BVEM

Table 1 provides a summary of the major and minor data quality issues identified in this data set. All data are acceptable except those results which have been qualified with "X", rejected. Data validation qualifiers along with associated descriptions are provided in Table 2. All data qualification related to this group of samples is detailed on the attached sheets.

All data users should note two facts. First, an "X" flag means that the associated value is unusable due to significant quality control (QC) problems, the data is invalid and provides no information as to whether the compound is present or not. "X" values should not appear on any data tables even as a last resort. Second, no analyte concentration, even if it passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data, but any value potentially contains error.

DATA ASSESSMENT

1. NARRATIVE AND COMPLETENESS REVIEW

The case narrative was reviewed, and the data package was checked for completeness. No discrepancies were noted.

2. SAMPLE DELIVERY AND CONDITION

The samples arrived at the laboratory at a temperature of 10.1°C above the data validation guideline recommendation and method requirement of 0-6°C. All results have been qualified "J" or "UJ" as appropriate on this basis.

Proper custody was documented.

3. HOLDING TIME

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Proper sample handling and preservation also play a role in the chemical stability of analytes in the sample matrix. If samples are not collected and stored using proper containers and/or preservatives, data may not be valid.

No problems were found for this criterion.

4. CALIBRATION

Satisfactory instrument calibration is established to ensure that the instrument can produce acceptable quantitative data. An initial calibration demonstrates that the instrument can give acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance. Additionally, a continuing calibration is analyzed at the end of each 12-hour analytical sequence, denoted as a "closing" calibration verification and ascertains acceptable performance at the conclusion of the analytical sequence.

A) Initial Calibration

Percent relative standard deviation (%RSD) is calculated from the initial calibration and is used to indicate stability of a specific compound over the calibration range.

An RSD value outside the initial calibration limit indicates the potential for quantitation errors. For this reason, all positive and non-detected results are qualified as estimated. Severe performance failures (RSD >30%) requires rejection of all results. The following QC criteria have been applied for this project: The %RSD of initial calibration must be <20%.

No problems were found for this criterion.

B) Continuing Calibration

The Percent Recovery (%R) for all target analytes in the continuing calibration must be within 70-130%. All initial calibration verification (ICV) and continuing calibration verification (CCV) %Rs were with acceptance limits with the following exceptions.

No problems were found for this criterion.

C) Instrument Sensitivity Check

Prior to analysis an instrument sensitivity check (ISC) must be performed. The ISC must be at the limit of quantitation (LOQ). All analyte concentrations must be within ±30%. Note: the laboratory reports refer to the ISC as Low-Concentration Calibration Verification (LCCV). The validator has determined that the LCCV in the laboratory's report is equivalent to the method required ISC.

No problems were found for this criterion.

5. BLANK CONTAMINATION

Quality assurance (QA) blanks, i.e., method, field, or rinse blanks are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Field and rinse blanks measure cross-contamination of samples during field operations. When an equipment blank, or lab blank has an analyte detection, then all associated field samples are qualified per validation guidance as appropriate.

A) Method blank contamination:

No problems were found for this criterion.

B) Instrument blank contamination:

No problems were found for this criterion.

B) Field/Equipment blank contamination:

No samples were submitted as field blanks in association with this SDG.

6. EXTRACTED INTERNAL STANDARDS

All samples are spiked with labeled standard compounds prior to sample preparation and analyses to evaluate overall laboratory performance and efficiency of the analytical technique. The reported project samples had observed surrogate recoveries within the established limits in all cases with the following exceptions.

No problems were found for this criterion.

7. NON-EXTRACTED INTERNAL STANDARDS

Non-extracted internal standard peak areas are used to quantify extracted internal standard recoveries. The reported project samples had non-extracted internal standard area counts within the established limits in all cases with the following exceptions.

No problems were found for this criterion.

8. COMPOUND IDENTIFICATION

The project target analyte compounds are identified on the LC/MS/MS by using the analytes retention time (RT). The retention time of each target analyte should be within ± 0.4 minutes of the predicted retention. Target analyte detections should display a signal-to-noise of ≥ 3:1, have proper peak integration, and display all ions at the correct retention times.

Target analyte detections should have passing ion ratios (50 - 150% of theoretical). Ion ratio failures could be caused by matrix interference and/or be the result of the presence of isomers in the sample at different ratios than the ratio of isomers present in the calibration standards.

Target compound identification was verified. No anomalies were identified with the following exceptions.

The transition mass ratio for PFHPA in sample AF-RHMW06-WGN01LF-2303W3 was outside the established ratio limit indicating some degree of uncertainty in the qualitative identification of the analyte. The result reported for the impacted analyte in the aforementioned sample has been qualified as estimated "J" on this basis.

9. COMPOUND QUANTIFICATION

Target compound quantitation was not verified as part of the Level 2B data validation.

Manual integrations were not reviewed at the Stage 2B level.

10. MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Matrix spike/matrix spike duplicate (MS/MSD) data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD data may be used in conjunction with other quality control criteria for additional qualification of data.

No samples were submitted for MS/MSD and/or matrix duplicate evaluation in association with this SDG.

11. FIELD DUPLICATES/ TRIPLICATES

Field duplicates may be taken and analyzed as an indication of overall precision. These analyses measure both field and laboratory precision. A control limit of ≤ 30% for the Relative Percent Difference (RPD) for water samples and ≤ 50% RPD for solid samples, shall be used when original and duplicate sample values are greater than or equal to the sample specific LOQ. For field duplicate analyses that do not meet the technical criteria, the action was applied to only the parent sample and its duplicate. A control limit of ≤35% RSD was applied for field triplicate samples when original and triplicate sample values are greater than the sample specific LOQ. For field triplicate analyses that do not meet the technical criteria, the action was applied to only the parent sample, duplicate and triplicate.

Samples AF-RHMW06-WGN01LF-2303W3 and AF-RHMW12A-WGFD01LF-2303W3 were submitted as a field duplicate pair in association with this SDG. Upon evaluation adequate field precision was demonstrated.

12. LABORATORY CONTROL SAMPLES

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results are used to verify that the laboratory can perform the analysis in a clean matrix. Note: in addition to the standard LCS the laboratory has also provided a second LCS referred to as the MRL check in the laboratory report. The validator has determined that the MRL check in the laboratory's report is equivalent to the required low level LCS.

No problems requiring result qualification were found for this criterion with the following exception.

The observed recovery for PFOS was greater than the upper acceptance limit for the low level LCS associated with all samples in this SDG. The positive results reported for the impacted analyte in the associated samples have been qualified estimated "J" in conjunction with other noncompliances (see section 2 above). Validation action was not required for non-detected results.

13. DILUTIONS, RE-EXTRACTIONS & REANALYSIS

Samples may be re-analyzed for dilution, re-extraction and for other QC reasons. In such cases, the best result values are used.

Samples were re-extracted and/or reanalyzed in several cases to confirm quality control results. Upon review, the laboratory reported the best and final result.

14. SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

Overall, the laboratory data generated met the project goals and quality control criteria, with the exceptions identified in this report and as summarized in Table 1.

Table 1
Review Elements Summary

	Were acceptance criteria met?		
	Yes	**No**	
Per-fluorinated Compounds		**Major**	**Minor**
Holding Time/Sample Handling			x
Method Blanks	x		
Instrument Blanks	x		
Field Blanks	NA		
Calibration Percent Relative Standard Deviation and Percent Difference	x		
Instrument Sensitivity Check	x		
Extracted Internal Standards	x		
Non-Extracted Internal Standards	x		
Compound Identification			x
Matrix Spike/Matrix Spike Duplicate	NA		
Laboratory Control Sample			x
Other Quality Control Data out of Specification	x		
Field Duplicate / Triplicate	x		

Major= Major data quality issue identified resulting in rejection of data.
Minor= Minor data quality issue identified resulting in the qualification of data. Data qualification should be used to inform the data users of data limitations.
NA = Not applicable

Table 2
Data Validation Qualifiers

Data Qualifier	Definition
U	**The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.**
J	**The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.**
J+	**The result is an estimated quantity, but the result may be biased high.**
J-	**The result is an estimated quantity, but the result may be biased low.**
UJ	**The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.**
X	**The sample results (including non-detects) were affected by serious deficiencies in the ability to analyze the sample and to meet published method and project quality control criteria. The presence or absence of the analyte cannot be substantiated by the data provided.**
R	**The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.**

Table 3
PFAS Definitions Table

NO	CAS #	Target Name	Target Abbreviation
1	763051-92-9	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS
2	914637-49-3	2H,2H,3H,3H-Perfluorooctanoic acid	5:3FTCA
3	812-70-4	3-Perfluoroheptyl propanoic acid	7:3FTCA
4	356-02-5	3-Perfluoropropyl propanoic acid	3:3FTCA
5	919005-14-4	4,8-Dioxa-3H-perfluorononanoic acid	ADONA
6	757124-72-4	4:2 Fluorotelomer sulfonic acid	4:2 FTS
7	27619-97-2	6:2 Fluorotelomer sulfonic acid	6:2 FTS
8	39108-34-4	8:2 Fluorotelomer sulfonic acid	8:2 FTS
9	756426-58-1	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS
10	13252-13-6	Hexafluoropropylene oxide dimer acid	HFPO-DA
11	4151-50-2	N-Ethyl perfluorooctanesulfonamide	NEtFOSA
12	2991-50-6	N-Ethyl perfluorooctanesulfonamidoacetic acid	NEtFOSAA
13	1691-99-2	N-Ethyl perfluorooctanesulfonamidoethanol	NEtFOSE
14	31506-32-8	N-Methyl heptadecafluorooctanesulfonamide	NMeFOSA
15	2355-31-9	N-Methyl perfluorooctanesulfonamidoacetic acid	NMeFOSAA
16	24448-09-7	N-Methyl perfluorooctanesulfonamidoethanol	NMeFOSE
17	151772-58-6	Nonafluoro-3,6-dioxaheptanoic acid	NFDHA
18	113507-82-7	Perfluoro(2-ethoxyethane)sulfonic acid	PFEESA
19	377-73-1	Perfluoro-3-methoxypropanoic acid	PFMPA
20	863090-89-5	Perfluoro-4-methoxybutanoic acid	PFMBA
21	375-73-5	Perfluorobutanesulfonic acid	PFBASA
22	375-22-4	Perfluorobutanoic acid	PFBA
23	335-77-3	Perfluorodecanesulfonic acid	PFDS
24	335-76-2	Perfluorodecanoic acid	PFDA
25	79780-39-5	Perfluorododecanesulfonic acid	PFDoS
26	307-55-1	Perfluorododecanoic acid	PFDoA
27	375-92-8	Perfluoroheptanesulfonic acid	PFHpS
28	375-85-9	Perfluoroheptanoic acid	PFHpA
29	355-46-4	Perfluorohexanesulfonic acid	PFHXSA
30	307-24-4	Perfluorohexanoic acid	PFHxA
31	68259-12-1	Perfluorononanesulfonic acid	PFNS
32	375-95-1	Perfluorononanoic acid	PFNA
33	754-91-6	Perfluorooctanesulfonamide	PFOSA
34	1763-23-1	Perfluorooctanesulfonic acid	PFOS
35	335-67-1	Perfluorooctanoic acid	PFOA
36	2706-91-4	Perfluoropentanesulfonic acid	PFPeS
37	2706-90-3	Perfluoropentanoic acid	PFPeA
38	376-06-7	Perfluorotetradecanoic acid	PFTeDA
39	72629-94-8	Perfluorotridecanoic acid	PFTrDA
40	2058-94-8	Perfluoroundecanoic acid	PFUnA

Data Qualification Reason Codes	
Reason Code	**Reason Code Description**
A	**Serial dilution**
A1	**Ambient Blank**
B	**The analyte was found in an associated blank as well as in the sample.**
B2	**CCB**
B3	**CCB - Neg**
B4	**Grinding Blank**
C	**LCS Recovery**
C1	**Reference Recovery**
C2	**Reference Recovery RPD**
D	**MS RPD**
D1	**Lab Replicate RPD**
D2	**No precision available**
D3	**Field Duplicate RPD**
D4	**Field Triplicate RSD**
D5	**Laboratory Triplicate RSD**
F	**Field Blank**
F1	**Hydrocarbon pattern does not match standard**
G1	**Initial Calibration RRF**
G2	**Initial Calibration RSD/r^2/r**
G3	**ICV RRF**
H1	**Test Hold Time**
H2	**Prep Hold Time**
I	**Surrogate recovery outside project limits.**
J	**CRA/CRI Recovery**
K	**An analyte (non-common laboratory artifact) was detected in the sample at a concentration less than 5X the concentration detected in the associated method blank.**
L	**Lab Blank**
L1	**Lab Blank - Neg**
M	**MS Recovery**
M2	**Post Spike**
N	**Blank - No Action**
O	**ICS**
P	**Sample preservation/collection requirement not met.**
P1	**Column RPD**
P2	**Improper preparation/extraction**
Q	**Encore sample holding time exceeded by more than 2X.**
Q1	**Material Blank**

Q2	**Encore sample holding time exceeded by less than 2X.**
R	**Exceeds LinearCalibration Range**
S	**Internal standard**
T	**Trip Blank**
TI	**Tentatively Identified Compound**
TR	**Trace Level Detect**
U	**Receipt Temperature**
V	**Equipment Blank**
V1	**ICV**
V2	**CCV**
V3	**CCV RRF**
V4	**Sample Receipt Condition**
V5	**Ending Continuing Calibration Verification**
V6	**Low Level Calibration Verification**
V7	**Interference Check Sample A**
V8	**Interference Check Sample AB**
V9	**Interference Check Sample A - Negative**
W	**Column breakdown (pesticides/8270)**
X	**Raised reporting limit**
Y	**Cooler temperature greater than 10 degreec C.**
Y1	**False Positive**
Y2	**Data rejected due to radiological anomolies**
Y3	**Non-accredited analyte/compound. Accreditation not offered at time of analyses for the analyte/compound by the stated method and matrix.**
Y4	**Performance Check - Degradation of DDT**
Y5	**Extracted Internal Standard**
Y6	**Analyte not confirmed on second column.**
Y7	**Signal to Noise Ratio not met**
Z	**LCS RPD**
Z1	**Non-accredited analyte/compound**
Z1	**Data rejected, more valid data available.**
Z2	**Detection Level not met uncertainty greater than DL**
Z4	**MDA Greater than RDL.**
Z5	**Ion Ratio**
Z6	**Samples were analyzed past the 12 hour time period from the Tune or opening CCV.**

Calculation Documentation

Field Duplicate Calculations

Parameters	Original Sample	Duplicate Sample	RPD	LOQ	Flag
	AF-RHMW06-WGN01LF-2303W3	AF-RHMW12A-WGFD01LF-2303W3			
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0	0	0.0	0.8	
2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	0	0	0.0	1.6	
3-Perfluoroheptyl propanoic acid (7:3FTCA)	0	0	0.0	1.6	
3-Perfluoropropyl propanoic acid (3:3FTCA)	0	0	0.0	1.6	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0	0	0.0	0.8	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	0	0	0.0	1.6	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	1.8	1.7	5.7	1.6	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	0	0	0.0	1.6	
9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0	0	0.0	0.8	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	0	0	0.0	0.8	
N-Ethyl perfluorooctanesulfonamide (NEtFOSA)	0	0	0.0	1.6	
N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0	0	0.0	0.4	
N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	0	0	0.0	1.6	
N-Methyl heptadecafluorooctanesulfonamide (NMeFOSA)	0	0	0.0	1.6	
N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0	0	0.0	0.4	
N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	0	0	0.0	1.6	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0	0	0.0	0.8	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	0	0	0.0	0.8	
Perfluoro-3-methoxypropanoic acid (PFMPA)	0	0	0.0	0.8	
Perfluoro-4-methoxybutanoic acid (PFMBA)	0	0	0.0	0.8	
Perfluorobutanesulfonic acid (PFBS)	0	0	0.0	0.4	
Perfluorobutanoic acid (PFBA)	1.4	1.3	7.4	1.6	
Perfluorodecanesulfonic acid (PFDS)	0	0	0.0	0.4	
Perfluorodecanoic acid (PFDA)	0	0	0.0	0.4	
Perfluorododecanesulfonic acid (PFDoS)	0	0	0.0	0.4	
Perfluorododecanoic acid (PFDoA)	0	0	0.0	0.4	
Perfluoroheptanesulfonic acid (PFHpS)	0	0	0.0	0.4	
Perfluoroheptanoic acid (PFHpA)	0.35	0.35	0.0	0.4	
Perfluorohexanesulfonic acid	0	0	0.0	0.4	
Perfluorohexanoic acid (PFHxA)	1.4	1.3	7.4	0.4	
Perfluorononanesulfonic acid (PFNS)	0	0	0.0	0.4	
Perfluorononanoic acid (PFNA)	0	0	0.0	0.4	
Perfluorooctanesulfonamide (PFOSA)	0.54	0.48	11.8	0.4	
Perfluorooctanesulfonic acid (PFOS)	0.95	0	200.0	0.4	ok <LOQ
Perfluorooctanoic acid (PFOA)	0	0	0.0	0.4	
Perfluoropentanesulfonic acid (PFPeS)	0	0	0.0	0.4	
Perfluoropentanoic acid (PFPeA)	4.7	4.7	0.0	0.8	
Perfluorotetradecanoic acid (PFTeDA)	0	0	0.0	0.4	
Perfluorotridecanoic acid (PFTrDA)	0	0	0.0	0.4	
Perfluoroundecanoic acid (PFUnA)	0	0	0.0	0.4	

Data Validation Worksheet

DATA VALIDATION PFAS

Module 6; PFAS by QSM Table 5-24; October 18, 2022

Validator: GAP

Reviewer: DM

Date Validated: 4/20/2023

Reviewed: 4/20/2023

Project: Red Hill

SDG: 23C0204

LAB: APPL

Samples Collected: 3/20/2023

5 aqueous

SAMPLE RECEIPT AND CASE NARRATIVE REVIEW

- ✓ Traffic reports, chain-of-custody forms or SDG narrative do not indicate any problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data.
- ✓ AFFF samples are to be shipped in HDPE containers with an unlined cap
- ✓ Shipment temp 0-6°C: recommended to freeze tissue samples upon receipt
- ✓ If temp upon receipt is greater than 6°C J/UJ all

  Received on 3/27 at 10.1C flag all results J/UJ

HOLDING TIMES

- ✓ Recommended storage temp is ≤ -20°C
- ✓ Per method 1633: aqueous samples may be held in the lab for up to 90 days when stored at recommended temp and protected from light; when stored at 0-6 °C and protected from light samples can be held for up to 28 days (see method for additional details)
- ✓ Per method 1633: solid samples may be held in the lab for up to 90 days when stored at recommended temp or 0-6 °C (see method for additional details)
- ✓ Per method 1633: biosolid samples may be held in the lab for up to 90 days when stored at recommended temp or 0-6 °C; however, freezing is recommended (see method for additional details)
- ✓ Samples extracts should be stored at 0-4°C protected from light and analyzed within 90 days

- ✓ If hold time is exceeded qualify J/UJ
- ✓ If hold time is grossly exceeded (2X hold time) J/X

244 Table II. Sample Storage and Holding Time Requirements

Matrix Type	Stored at 0 - 6°C, protected from light		Stored at ≤ -20°C, protected from light	
	Holding Time	Caveat	Holding Time	Caveat
Aqueous	28 days	Precursor degradation occurs after 7 days	90 days	None
Solid and Tissue	90 days	Should be prepared as soon as possible if NFDHA is a target analyte	90 days	Should be prepared as soon as possible if NFDHA is a target analyte
Biosolid	90 days	Not recommended due to the production of gases due to microbiological activity	90 days	None

Samples collected 3/20/23
Extracted 4/4
Analyzed 4/7

All ok

Extracted Internal STANDARDS

- ✓ Added to all QC and field samples
- ✓ Recoveries are within the limits as defined in QAPP; otherwise QSM criteria (20-150%) should be used
- ✓ Detected for analytes qualified using an EIS percent recovery >200% should be qualified J-. Nod-detects should not be qualified.
- ✓ If EIS recovery is <10%; associated detected and non-detects should be qualified X
- ✓ EIS retention times should be within 0.4 minutes of standard; use professional judgment to qualify

For Red Hill project(see Kristin's email on file in project folder 12/14/22 at 3:25pm)

For EIS %Rs >150% J- positive results, no action on non-detects

For EIS %Rs between lab limit of 20-150%; no action

For EIS %Rs <20% but >10%; J+ positive results, UJ non-detects

For EIS %Rs <10% X positive and non-detected (and recommend R of non-detected, J+ of positive results)

All ok

Non-Extracted Internal STANDARDS

- ✓ Used to quantify EIS
- ✓ If low area counts are reported (<30%) detected and non-detected should be qualified X

Laboratory Control Sample (LCS) and Low-Level Laboratory Control Sample (LLLCS)
(MRL in APPL data package)

- ✓ LCMS Lab Control Recovery (Form III), Form I, prep log, run log
- ✓ LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG.
- ✓ Laboratory Control Samples were analyzed for all the target analytes that the samples are analyzed for.
- ✓ Use limits as defined in QAPP; otherwise lab limits or QSM criteria of 40-150%.
- ✓ If LCS or LLLCS %R is > upper limit; qualify detects J+; no action on non-detected
- ✓ If LCS or LLLCS %R is < lower limit; qualify detected J- and non-detected X

Use 40-150 to evaluate
All 40 compounds included.

BCD0035-BS1 all ok

MRL Check (BCD0035-MRL1) all ok except
PFHXS ↑ **no action ND**
PFOS ↑ **positive J+; no action ND**

MS/MSD and Matrix Duplicate

- ✓ LCMS Matrix Spike Recovery (Form III)
- ✓ The Matrix Spike Samples were spiked and analyzed for all the target analytes that the samples are analyzed for (Same analytes as LCS).

- ✓ Per module 6: MS and MSD are applicable where the spike concentration is a least 3 times greater than the native analyte concentration **(3X rule)**
- ✓ Use limits as defined in QAPP; otherwise lab limits or QSM criteria of 40-150%.
- ✓ If MS or MSD %R is > upper limit; qualify detects J+; no action on non-detected
- ✓ If MS or MSD %R is < lower limit but >10%; qualify detected J- and non-detected UJ
- ✓ If MS or MSD %R is < 10%; qualify detected J- and non-detected X
- ✓ If MS/MSD RPD is out; qualify detected J and non-detected UJ
- ✓ For matrix duplicate; for concentrations of analytes that are equal to or greater than the LOQ, the RPD must be ≤30%; if out qualified detected J; no action on non-detects

Use 40-150% to evaluate
Sample: **None**

BLANKS

- ✓ LCMS Method Blank Summary (Form IV), method blank Form I, prep log, run log
- ✓ Frequency of Analysis: method blank has been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch.
- ✓ Continuing Calibration Blanks (Form I) and run log
- ✓ Frequency of Analysis: immediately following the highest standard analyzed and daily prior to sample analysis.
- ✓ Field/rinse blanks are non-detected for all analytes

312 **Table III: Sample Qualification in the Presence of Blank Contamination**

	Sample		
Row Number	Result	Validated Result	Validation Qualifier
1	Non-detect or detect ≤ LOD	Report at LOD	U
2	> LOQ but ≤ 5x blank	Report at Sample Result	J+
3	> LOQ and > 5x blank	Report at Sample Result	None

313 LOD = Limit of Detection

FB/EBs
None

Blank (BCD0035-BLK1)
ND

ICBs/CCBs see below

MASS CALIBRATION

- ✓ Verified to be ±0.2 amu of true value

Bile Salt Interference Check and Qualitative Identification Standard

- ✓ Provided and requirements met
- ✓ See Module 6

acceptable

ICAL

- ✓ Initial Calibration Data Curve Evaluation (Form VI) and run log
- ✓ Lowest standard should be at or below LOQ
- ✓ %RSD <20% or relative standard error (RSE) <20%
- ✓ If %RSD > 20% but <30% J/UJ
- ✓ If %RSD >30% J/R

See below

INSTRUMENT PERFORMANCE CHECK PER DRAFT METHOD 1633 (LCV in APPL data package)

- ✓ Concentration equal to LOQ
- ✓ Analyzed after ICAL and daily before samples
- ✓ If not analyzed all associated data should be qualified X
- ✓ The %R for ICV and CCV 30%; if out >130% qualify positive J+ and nondetected UJ; if out <70% qualify positives J- and nondetects UJ
- ✓ Per module if gross exceedances of recoveries <50% or >150%; qualify all associate data X

CCAL

- ✓ Continuing Calibration Data (Form VII) and run log
- ✓ Continuing calibration standard analyzed on each working day, prior to sample analyses.
- ✓ Calibration verification/continuing calibration standard been analyzed after every 10 samples and at the end of each analytical sequence
- ✓ If not analyzed all associated data should be qualified X
- ✓ The %R for ICV and CCV 30%; if out >130% qualify positive J+ and nondetected UJ; if out <70% qualify positives J- and nondetects UJ
- ✓ Per module if gross exceedances of recoveries <50% or >150%; qualify all associate data X

LCV is the method required ISC
70-130%

Instrument Saphira

4/7/2023 all %RSE <20%

Initial Cal Blank SC01366-ICB1 S2023-04-07A (9) 04/07/23 15:38 all ND
Secondary Cal Check SC01366-SCV1 S2023-04-07A (10) 04/07/23 15:51 ok
Calibration Blank SC01368-CCB1 S2023-04-07B (1) 04/07/23 16:17 all ND
Low Cal Check SC01368-LCV1 S2023-04-07B (2) 04/07/23 16:30 ok
Calibration Check SC01368-CCV1 S2023-04-07B (3) 04/07/23 16:43 ok
Calibration Blank SC01368-CCB2 S2023-04-07B (6) 04/07/23 17:21 all ND
All samples
Calibration Check SC01368-CCV2 S2023-04-07B (26) 04/07/23 21:39 ok
Calibration Blank SC01368-CCB3 S2023-04-07B (27) 04/07/23 21:52 all ND

COMPOUND INDENTIFICATION

- ✓ RT within ±0.4 RRT units (review for Level 4)
- ✓ S/N ration 3:1 (review for Level 4)
- ✓ Ion response ratio with ±50% (review for Level 2B)
- ✓ If ion ratio is outside limit; qualify J

Use J flag for module 6
Reason Code: Z5

AF-RHMW06-WGN01LF-2303W3

PFHPA FLAG J

FIELD DUPLICATES

- ✓ Use QAPP defined criteria
- ✓ If outside acceptance criteria qualify J/UJ (MODULE FLAGS NONDETECTS TOO)

For field triplicates use 35% RSD per Kristin's email on file from 12/14/22

AF-RHMW06-WGN01LF-2303W3 / AF-RHMW12A-WGFD01LF-2303W3

All ok

SEE FIELD DUPLICATE WORKSHEET

Facility:	RH Fire Suppression System
Event:	AFFF Assessment Sampling GW 2023 March
Guidance Document:	RHS PFAS UFP-QAPP
Contract Laboratory:	Agriculture & Priority Pollutants Laboratories, Inc.
Field Contractor:	AECOM, Honolulu, HI
Data Review Contractor:	
SDG:	23C0204, Certified - 4/11/2023 by JeremyHale
QC Level:	
Project Manager:	
Data Reviewer:	
Data Reviewer Title:	
Date of Review Report:	

Analytical Method/ Leach Method	Normal Water Samples	Field QC Water Samples
E1633DR/NONE	4	1

This report assesses the analytical data quality associated with the analyses listed on the preceding cover page. This assessment has been made through a combination of automated data review (ADR) and supplemental manual review, the details of which are described below. The approach taken in the review of this data set is consistent with the requirements contained in the RHS PFAS UFP-QAPP to the extent possible. Where definitive guidance is not provided, data has been evaluated in a conservative manner using professional judgment. In cases where two qualifiers are listed as an action, such as 'J/UJ', the first qualifier applies to positive results, and the second to non-detect results.

Samples were collected by AECOM, Honolulu, HI; analyses were performed by Agriculture & Priority Pollutants Laboratories, Inc. and were reported under sample delivery group (SDG) 23C0204. Results have been evaluated electronically using electronic data deliverables (EDDs) provided by the laboratory. The laboratory data summary forms (hard copy) have been reviewed during this effort and compared to the automated review output. Findings based on the automated data submission and manual data verification processes are detailed in the ADR narrative.

The following quality control elements were supported by the electronic deliverable and were evaluated during this review effort:

Blank - Negative
Extracted Internal Standard
Field Duplicate RPD
Lab Blank
LCS Recovery
Prep Hold Time
Surrogate
Test Hold Time

The following quality control elements were either not applicable to the deliverable, or were not supported by the electronic deliverable, and were therefore not included in the automated data review. Those elements required for the project were reviewed manually, as narrated in the Comment section below.

Ambient Blank
Calibration Blank
Calibration Blank - Negative
Continuing Calibration Verification
Ending Continuing Calibration Verification
Equipment Blank
Field Blank
Field Triplicate RSD
Grinding Blank
Initial Calibration Verification
Interference Check Sample A
Interference Check Sample A - Negative
Interference Check Sample AB
Lab Replicate RPD
Laboratory Triplicate RSD
LCS RPD
Low Level Calibration Verification

Material Blank
MS Recovery
MS RPD
Post Spike
Reference Material
Reference Material RPD
Trip Blank

A representative sampling or ten percent of sample and QC results were manually evaluated for compliance with project specific requirements and consistency with hard copy results. The following summaries were generated during the evaluation of this data set and are included in this report as applicable.

Batch – The analytical batch report is reviewed for completeness and compliance with project specific requirements. Incomplete or non-compliant run sequences are identified and their impact on data quality are discussed in the narrative.

QC Outlier – Results exceeding the evaluation criteria are reviewed for compliance with project requirements and a minimum of ten percent of the non-compliant QC values reported electronically are verified for consistency with hard-copy values.

Qualified Results – Qualified results are evaluated for compliance with project requirements and ten percent of qualified results are verified for consistency with the QC Outliers.

Rejected Results – All rejected results are evaluated for compliance with project requirements. The reason for rejection of the data is verified against hard copy data.

Field Duplicates – Field duplicate comparison results are evaluated for compliance with project requirements and ten percent of values reported are verified for consistency with the hard-copy data.

Data Submission Warnings – Warnings encountered during the data submission process are evaluated and their affect on data quality is discussed in the narrative below.

Analytical deficiencies, project non-compliance issues and inconsistencies with hard copy results observed during ADR evaluation process and their impact on data quality are summarized in the narrative below.

A total of 200 results (100.00%) out of the 200 results (sample and field QC samples) reported are qualified based on review and 0 results (0.00%) have been rejected. Trace values are not counted as qualified results in the above count. The qualified results are detailed in the following tables and discussed in the narrative below, where appropriate.

Narrative Comments

Analytical Method	Comment

Reviewed by ,

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW04-WGN01LF-2303W3	N	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	3-Perfluoroheptyl propanoic acid (7:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	3-Perfluoropropyl propanoic acid (3:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamide (NEtFOSA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	N-Methyl heptadecafluorooctanesulfonamide (NMeFOSA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorobutanesulfonic acid (PFBS)	0.35	0.35 U	0.35 UJ		NG/L	U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW04-WGN01LF-2303W3	N	Perfluorobutanoic acid (PFBA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorodecanesulfonic acid (PFDS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorodecanoic acid (PFDA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorododecanesulfonic acid (PFDoS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorododecanoic acid (PFDoA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoroheptanesulfonic acid (PFHpS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoroheptanoic acid (PFHpA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorohexanesulfonic acid	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorohexanoic acid (PFHxA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorononanesulfonic acid (PFNS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorononanoic acid (PFNA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorooctanesulfonamide (PFOSA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorooctanesulfonic acid (PFOS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorooctanoic acid (PFOA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoropentanesulfonic acid (PFPeS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoropentanoic acid (PFPeA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorotetradecanoic acid (PFTeDA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluorotridecanoic acid (PFTrDA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW04-WGN01LF-2303W3	N	Perfluoroundecanoic acid (PFUnA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	3-Perfluoroheptyl propanoic acid (7:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	3-Perfluoropropyl propanoic acid (3:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW06-WGN01LF-2303W3	N	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamide (NEtFOSA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	N-Methyl heptadecafluorooctanesulfonamide (NMeFOSA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.69	0.69 U	0.69 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorobutanesulfonic acid (PFBS)	0.35	0.089 FJ	0.089 J		NG/L	TR/U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorobutanoic acid (PFBA)	1.4	0.38 FJ	0.38 J		NG/L	TR/U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorodecanesulfonic acid (PFDS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorodecanoic acid (PFDA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorododecanesulfonic acid (PFDoS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorododecanoic acid (PFDoA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoroheptanesulfonic acid (PFHpS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoroheptanoic acid (PFHpA)	0.35	0.37 I	0.37 J		NG/L	U/Z5
AF-RHMW06-WGN01LF-2303W3	N	Perfluorohexanesulfonic acid	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorohexanoic acid (PFHxA)	0.35	0.31 FJ	0.31 J		NG/L	TR/U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW06-WGN01LF-2303W3	N	Perfluorononanesulfonic acid (PFNS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorononanoic acid (PFNA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorooctanesulfonamide (PFOSA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorooctanesulfonic acid (PFOS)	0.35	0.10 FJ	0.10 J		NG/L	C/TR/U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorooctanoic acid (PFOA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoropentanesulfonic acid (PFPeS)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoropentanoic acid (PFPeA)	0.69	0.53 FJ	0.53 J		NG/L	TR/U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorotetradecanoic acid (PFTeDA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluorotridecanoic acid (PFTrDA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW06-WGN01LF-2303W3	N	Perfluoroundecanoic acid (PFUnA)	0.35	0.35 U	0.35 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	3-Perfluoroheptyl propanoic acid (7:3FTCA)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	3-Perfluoropropyl propanoic acid (3:3FTCA)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	1.6	1.7	1.7 J		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	N-Ethyl perfluorooctanesulfonamide (NEtFOSA)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	N-Methyl heptadecafluorooctanesulfonamide (NMeFOSA)	1.6	1.6 U	1.6 UJ		NG/L	U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW12A-WGFD01LF-2303W3	FD	N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	1.6	1.6 U	1.6 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.80	0.80 U	0.80 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorobutanesulfonic acid (PFBS)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorobutanoic acid (PFBA)	1.6	1.3 FJ	1.3 J		NG/L	TR/U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorodecanesulfonic acid (PFDS)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorodecanoic acid (PFDA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorododecanesulfonic acid (PFDoS)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorododecanoic acid (PFDoA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoroheptanesulfonic acid (PFHpS)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoroheptanoic acid (PFHpA)	0.40	0.35 FJ	0.35 J		NG/L	TR/U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorohexanesulfonic acid	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorohexanoic acid (PFHxA)	0.40	1.3	1.3 J		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorononanesulfonic acid (PFNS)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorononanoic acid (PFNA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorooctanesulfonamide (PFOSA)	0.40	0.48	0.48 J		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorooctanesulfonic acid (PFOS)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorooctanoic acid (PFOA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoropentanesulfonic acid (PFPeS)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoropentanoic acid (PFPeA)	0.80	4.7	4.7 J		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorotetradecanoic acid (PFTeDA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluorotridecanoic acid (PFTrDA)	0.40	0.40 U	0.40 UJ		NG/L	U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW12A-WGFD01LF-2303W3	FD	Perfluoroundecanoic acid (PFUnA)	0.40	0.40 U	0.40 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.73	0.73 U	0.73 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	3-Perfluoroheptyl propanoic acid (7:3FTCA)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	3-Perfluoropropyl propanoic acid (3:3FTCA)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.73	0.73 U	0.73 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	1.5	1.8	1.8 J		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.73	0.73 U	0.73 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.73	0.73 U	0.73 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamide (NEtFOSA)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	N-Methyl heptadecafluorooctanesulfonamide (NMeFOSA)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	1.5	1.5 U	1.5 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.73	0.73 U	0.73 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	0.73	0.73 U	0.73 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.73	0.73 U	0.73 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.73	0.73 U	0.73 UJ		NG/L	U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorobutanesulfonic acid (PFBS)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorobutanoic acid (PFBA)	1.5	1.4 FJ	1.4 J		NG/L	TR/U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorodecanesulfonic acid (PFDS)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorodecanoic acid (PFDA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorododecanesulfonic acid (PFDoS)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorododecanoic acid (PFDoA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoroheptanesulfonic acid (PFHpS)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoroheptanoic acid (PFHpA)	0.37	0.35 FJ	0.35 J		NG/L	TR/U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorohexanesulfonic acid	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorohexanoic acid (PFHxA)	0.37	1.4	1.4 J		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorononanesulfonic acid (PFNS)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorononanoic acid (PFNA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorooctanesulfonamide (PFOSA)	0.37	0.54	0.54 J		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorooctanesulfonic acid (PFOS)	0.37	0.95	0.95 J		NG/L	C/U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorooctanoic acid (PFOA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoropentanesulfonic acid (PFPeS)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoropentanoic acid (PFPeA)	0.73	4.7	4.7 J		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorotetradecanoic acid (PFTeDA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluorotridecanoic acid (PFTrDA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW12A-WGN01LF-2303W3	N	Perfluoroundecanoic acid (PFUnA)	0.37	0.37 U	0.37 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	2H,2H,3H,3H-Perfluorooctanoic acid (5:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	3-Perfluoroheptyl propanoic acid (7:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	3-Perfluoropropyl propanoic acid (3:3FTCA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW16-WGN01LF-2303W3	N	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Hexafluoropropylene oxide dimer acid (HFPO-DA)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamide (NEtFOSA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	N-Ethyl perfluorooctanesulfonamidoethanol (NEtFOSE)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	N-Methyl heptadecafluorooctanesulfonamide (NMeFOSA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	N-Methyl perfluorooctanesulfonamidoethanol (NMeFOSE)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoro-3-methoxypropanoic acid (PFMPA)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoro-4-methoxybutanoic acid (PFMBA)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorobutanesulfonic acid (PFBS)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorobutanoic acid (PFBA)	1.4	1.4 U	1.4 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorodecanesulfonic acid (PFDS)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorodecanoic acid (PFDA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorododecanesulfonic acid (PFDoS)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorododecanoic acid (PFDoA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoroheptanesulfonic acid (PFHpS)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoroheptanoic acid (PFHpA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorohexanesulfonic acid	0.36	0.36 U	0.36 UJ		NG/L	U

Qualified Results

Test Method: E1633DR	Extraction Method: METHOD		Leach Method: NONE		Matrix: WG			
FieldSample ID	Type	Analyte	RL	Lab Result	Qualified Result	Bias	Units	Reason
AF-RHMW16-WGN01LF-2303W3	N	Perfluorohexanoic acid (PFHxA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorononanesulfonic acid (PFNS)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorononanoic acid (PFNA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorooctanesulfonamide (PFOSA)	0.36	0.15 FJ	0.15 J		NG/L	TR/U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorooctanesulfonic acid (PFOS)	0.36	0.28 FJ	0.28 J		NG/L	C/TR/U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorooctanoic acid (PFOA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoropentanesulfonic acid (PFPeS)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoropentanoic acid (PFPeA)	0.71	0.71 U	0.71 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorotetradecanoic acid (PFTeDA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluorotridecanoic acid (PFTrDA)	0.36	0.36 U	0.36 UJ		NG/L	U
AF-RHMW16-WGN01LF-2303W3	N	Perfluoroundecanoic acid (PFUnA)	0.36	0.36 U	0.36 UJ		NG/L	U

Reason Code Definitions

Code	Definition
C	LCS Recovery
D3	Field Duplicate RPD
H2	Prep Hold Time
TR	Trace Level Detect
U	Receipt Temperature
Z5	Ion Ratio

Flag Code and Definitions

Flag	Definition
J	Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification".
NJ	The analysis indicates the presence of an analyte that has been “tentatively identified” and the associated numerical value represents its approximate concentration.
R	The data are rejected due to deficiencies in meeting QC criteria and may not be used for decision making.
U	Undetected: The analyte was analyzed for, but not detected.
UJ	The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.