

Chemical Analysis Report

NE-DIST-2022-01-21-02

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Overflow Analyses Performed By:
Eurofins TestAmerica Pensacola
3355 McLemore Drive
Pensacola, FL 32514
DOH Accreditation E81010

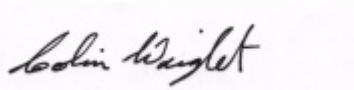
Event Description: **St.John Foam Response**
Request ID: **RQ-2022-01-17-50**
Customer: **NE-DIST**
Project ID: **DISTRICT**

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Certified by: Colin Wright, Program Administrator

Date Certified: 03-FEB-2022 13:23



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Overflow and Pesticides.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: SJR at Willow Branch

Collection Date/Time: 01/18/2022 10:50

Field ID: SJR at Willow Branch

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2301157	DEP SOP: LC-001-3	Perfluorobutanesulfonic acid (PFBS)**	3.3		ng/L	P408265	
		Perfluorobutanoic acid (PFBA)**	6.7	I	ng/L	P408265	
		Perfluorodecanoic acid (PFDA)**	4.0	U	ng/L	P408265	
		Perfluorododecanoic acid (PFDoA)**	2.0	U	ng/L	P408265	
		Perfluoroheptanoic acid (PFHpA)**	2.0	U	ng/L	P408265	
		Perfluorohexanesulfonic acid (PFHxS)**	2.2	I	ng/L	P408265	
		Perfluorohexanoic acid (PFHxA)**	3.5	I	ng/L	P408265	
		Perfluorononanoic acid (PFNA)**	2.0	U	ng/L	P408265	
		Perfluorooctanoic acid (PFOA)**	2.1	I	ng/L	P408265	
		Perfluorooctanesulfonic acid (PFOS)**	4.7	I	ng/L	P408265	
		Perfluoropentanoic acid (PFPeA)**	4.0	I	ng/L	P408265	
		Perfluorotetradecanoic acid (PFTeA)**	2.0	U	ng/L	P408265	
		Perfluorotridecanoic acid (PFTriA)**	2.0	U	ng/L	P408265	
		Perfluoroundecanoic acid (PFUnA)**	2.0	U	ng/L	P408265	
		Perfluoropentanesulfonic acid (PFPeS)**	0.56	I	ng/L	P408265	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.81	U	ng/L	P408265	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P408265	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P408265	
		4,8-Dioxa-3H-perfluorononanoic acid (ADONA)**	0.40	U	ng/L	P408265	
		Perfluoro-1-butane sulfonamide (FBSA)**	0.81	U	ng/L	P408265	
		Perfluoro-1-hexane sulfonamide (FHxSA)**	0.81	U	ng/L	P408265	
		Perfluoro-1-octane sulfonamide (FOSA)**	0.40	U	ng/L	P408265	
		11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)**	2.0	U	ng/L	P408265	
		9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)**	2.0	U	ng/L	P408265	
		1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)**	2.0	U	ng/L	P408265	
		1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)**	16	U	ng/L	P408265	
		1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)**	2.0	U	ng/L	P408265	
		N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)**	0.81	U	ng/L	P408265	
		N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)**	0.81	U	ng/L	P408265	
		Hexafluoropropylene oxide dimer acid (HFPO-DA)**	4.0	U	ng/L	P408265	
		Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)**	4.0	U	ng/L	P408265	
		Perfluoro-4-methoxybutanoic acid (PFMBA)**	4.0	U	ng/L	P408265	
		Perfluoro-3-methoxypropanoic acid (PFMPA)**	4.0	U	ng/L	P408265	
		Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)**	4.0	U	ng/L	P408265	

Field ID: SJR at Willow Branch

Matrix: W-SURF-FRH

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2301157	DEP SOP: LC-001-3	Perfluoropropanesulfonic acid (PFPrS)**	4.0	U	ng/L	P408265	
		Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)**	8.1	U	ng/L	P408265	
2302845	SM 5540 C	MBAS	0.067	U	mg MBAS/L		

Sample Location: Field Blank

Collection Date/Time: 01/18/2022 11:00

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2301158	DEP SOP: LC-001-3	Perfluorobutanesulfonic acid (PFBS)**	0.40	U	ng/L	P408265	
		Perfluorobutanoic acid (PFBA)**	4.0	U	ng/L	P408265	
		Perfluorodecanoic acid (PFDA)**	4.0	U	ng/L	P408265	
		Perfluorododecanoic acid (PFDoA)**	2.0	U	ng/L	P408265	
		Perfluoroheptanoic acid (PFHpA)**	2.0	U	ng/L	P408265	
		Perfluorohexanesulfonic acid (PFHxS)**	0.80	U	ng/L	P408265	
		Perfluorohexanoic acid (PFHxA)**	2.0	U	ng/L	P408265	
		Perfluorononanoic acid (PFNA)**	2.0	U	ng/L	P408265	
		Perfluorooctanoic acid (PFOA)**	2.0	U	ng/L	P408265	
		Perfluorooctanesulfonic acid (PFOS)**	2.0	U	ng/L	P408265	
		Perfluoropentanoic acid (PFPeA)**	2.0	U	ng/L	P408265	
		Perfluorotetradecanoic acid (PFTeA)**	2.0	U	ng/L	P408265	
		Perfluorotridecanoic acid (PFTriA)**	2.0	U	ng/L	P408265	
		Perfluoroundecanoic acid (PFUnA)**	2.0	U	ng/L	P408265	
		Perfluoropentanesulfonic acid (PFPeS)**	0.40	U	ng/L	P408265	
		Perfluoroheptanesulfonic acid (PFHpS)**	0.80	U	ng/L	P408265	
		Perfluorononanesulfonic acid (PFNS)**	0.40	U	ng/L	P408265	
		Perfluorodecanesulfonic acid (PFDS)**	0.40	U	ng/L	P408265	
		4,8-Dioxa-3H-perfluorononanoic acid (ADONA)**	0.40	U	ng/L	P408265	
		Perfluoro-1-butane sulfonamide (FBSA)**	0.80	U	ng/L	P408265	
		Perfluoro-1-hexane sulfonamide (FHxSA)**	0.80	U	ng/L	P408265	
		Perfluoro-1-octane sulfonamide (FOSA)**	0.40	U	ng/L	P408265	
		11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)**	2.0	U	ng/L	P408265	
		9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)**	2.0	U	ng/L	P408265	
		1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)**	2.0	U	ng/L	P408265	
		1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)**	16	U	ng/L	P408265	
		1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)**	2.0	U	ng/L	P408265	
		N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)**	0.80	U	ng/L	P408265	
		N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)**	0.80	U	ng/L	P408265	
		Hexafluoropropylene oxide dimer acid (HFPO-DA)**	4.0	U	ng/L	P408265	
		Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)**	4.0	U	ng/L	P408265	
		Perfluoro-4-methoxybutanoic acid (PFMBA)**	4.0	U	ng/L	P408265	
		Perfluoro-3-methoxypropanoic acid (PFMPA)**	4.0	U	ng/L	P408265	
		Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)**	4.0	U	ng/L	P408265	

Field ID: Field Blank

Matrix: W-FIELD-BK

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2301158	DEP SOP: LC-001-3	Perfluoropropanesulfonic acid (PFPrS)**	4.0	U	ng/L	P408265	
		Nonafluoro-3,6-dioxiheptanoic acid (NFDHA)**	8.0	U	ng/L	P408265	

Quality Assurance Report

Method Blank Results

Reference Method: DEP SOP: LC-001-3

Batch ID: P408265

Component	Result	Code	Units
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.0	U	ng/L
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	2.0	U	ng/L
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	2.0	U	ng/L
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	16	U	ng/L
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	0.40	U	ng/L
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	2.0	U	ng/L
Hexafluoropropylene oxide dimer acid (HFPO-DA)	4.0	U	ng/L
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	0.80	U	ng/L
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	0.80	U	ng/L
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.0	U	ng/L
Perfluoro-1-butane sulfonamide (FBSA)	0.80	U	ng/L
Perfluoro-1-hexane sulfonamide (FHxSA)	0.80	U	ng/L
Perfluoro-1-octane sulfonamide (FOSA)	0.40	U	ng/L
Perfluoro-3-methoxypropanoic acid (PFMPA)	4.0	U	ng/L
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	4.0	U	ng/L
Perfluoro-4-methoxybutanoic acid (PFMBA)	4.0	U	ng/L
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	4.0	U	ng/L
Perfluorobutanesulfonic acid (PFBS)	0.40	U	ng/L
Perfluorobutanoic acid (PFBA)	4.0	U	ng/L
Perfluorodecanesulfonic acid (PFDS)	0.40	U	ng/L
Perfluorodecanoic acid (PFDA)	4.0	U	ng/L
Perfluorododecanoic acid (PFDoA)	2.0	U	ng/L
Perfluoroheptanesulfonic acid (PFHpS)	0.80	U	ng/L
Perfluoroheptanoic acid (PFHpA)	2.0	U	ng/L
Perfluorohexanesulfonic acid (PFHxS)	0.80	U	ng/L
Perfluorohexanoic acid (PFHxA)	2.0	U	ng/L
Perfluorononanesulfonic acid (PFNS)	0.40	U	ng/L
Perfluorononanoic acid (PFNA)	2.0	U	ng/L
Perfluorooctanesulfonic acid (PFOS)	2.0	U	ng/L
Perfluorooctanoic acid (PFOA)	2.0	U	ng/L
Perfluoropentanesulfonic acid (PFPeS)	0.40	U	ng/L
Perfluoropentanoic acid (PFPeA)	2.0	U	ng/L
Perfluoropropanesulfonic acid (PFPrS)	4.0	U	ng/L
Perfluorotetradecanoic acid (PFTeA)	2.0	U	ng/L
Perfluorotridecanoic acid (PFTriA)	2.0	U	ng/L
Perfluoroundecanoic acid (PFUnA)	2.0	U	ng/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: DEP SOP: LC-001-3

Batch ID: P408265

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	69.4		P	30 - 160
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	99.6		P	30 - 160
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	91.1		P	30 - 160
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	92.2		P	30 - 160
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	88.1		P	30 - 160
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	90.3		P	30 - 160
Hexafluoropropylene oxide dimer acid (HFPO-DA)	91.4		P	30 - 160
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	89.6		P	30 - 160
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	84.5		P	30 - 160
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	153		P	30 - 160
Perfluoro-1-butane sulfonamide (FBSA)	152		P	30 - 160
Perfluoro-1-hexane sulfonamide (FHxSA)	132		P	30 - 160
Perfluoro-1-octane sulfonamide (FOSA)	98.4		P	30 - 160
Perfluoro-3-methoxypropanoic acid (PFMPA)	103		P	30 - 160
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	83.6		P	30 - 160
Perfluoro-4-methoxybutanoic acid (PFMBA)	96.9		P	30 - 160
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	101		P	30 - 160
Perfluorobutanesulfonic acid (PFBS)	94.0		P	30 - 160
Perfluorobutanoic acid (PFBA)	100		P	30 - 160
Perfluorodecanesulfonic acid (PFDS)	88.3		P	30 - 160
Perfluorodecanoic acid (PFDA)	81.6		P	30 - 160
Perfluorododecanoic acid (PFDoA)	80.1		P	30 - 160
Perfluoroheptanesulfonic acid (PFHpS)	75.3		P	30 - 160
Perfluoroheptanoic acid (PFHpA)	87.0		P	30 - 160
Perfluorohexanesulfonic acid (PFHxS)	93.3		P	30 - 160
Perfluorohexanoic acid (PFHxA)	101		P	30 - 160
Perfluorononanesulfonic acid (PFNS)	95.3		P	30 - 160
Perfluorononanoic acid (PFNA)	93.2		P	30 - 160
Perfluorooctanesulfonic acid (PFOS)	96.2		P	30 - 160
Perfluorooctanoic acid (PFOA)	95.2		P	30 - 160
Perfluoropentanesulfonic acid (PFPeS)	87.1		P	30 - 160
Perfluoropentanoic acid (PFPeA)	92.6		P	30 - 160
Perfluoropropanesulfonic acid (PFPrS)	88.5		P	30 - 160
Perfluorotetradecanoic acid (PFTeA)	90.0		P	30 - 160
Perfluorotridecanoic acid (PFTriA)	118		P	30 - 160
Perfluoroundecanoic acid (PFUnA)	124		P	30 - 160

Quality Assurance Report

Matrix Spike Accuracy

Reference Method: DEP SOP: LC-001-3

Batch ID: P408265

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2299813	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	53.4	47.0	P/P	30 - 160
2299813	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	96.2	82.6	P/P	30 - 160
2299813	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	87.0	90.2	P/P	30 - 160
2299813	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	103	97.0	P/P	30 - 160
2299813	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	118	88.8	P/P	30 - 160
2299813	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	74.7	86.3	P/P	30 - 160
2299813	Hexafluoropropylene oxide dimer acid (HFPO-DA)	100	81.5	P/P	30 - 160
2299813	N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	93.8	115	P/P	30 - 160
2299813	N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	93.1	91.7	P/P	30 - 160
2299813	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	116	122	P/P	30 - 160
2299813	Perfluoro-1-butane sulfonamide (FBSA)	147	136	P/P	30 - 160
2299813	Perfluoro-1-hexane sulfonamide (FHxSA)	108	98.0	P/P	30 - 160
2299813	Perfluoro-1-octane sulfonamide (FOSA)	103	97.3	P/P	30 - 160
2299813	Perfluoro-3-methoxypropanoic acid (PFMPA)	110	102	P/P	30 - 160
2299813	Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	75.0	81.2	P/P	30 - 160
2299813	Perfluoro-4-methoxybutanoic acid (PFMBA)	104	109	P/P	30 - 160
2299813	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	112	105	P/P	30 - 160
2299813	Perfluorobutanesulfonic acid (PFBS)	103	93.6	P/P	30 - 160
2299813	Perfluorobutanoic acid (PFBA)	102	100	P/P	30 - 160
2299813	Perfluorodecanesulfonic acid (PFDS)	60.7	57.5	P/P	30 - 160
2299813	Perfluorodecanoic acid (PFDA)	98.8	81.4	P/P	30 - 160
2299813	Perfluorododecanoic acid (PFDoA)	98.3	81.4	P/P	30 - 160
2299813	Perfluoroheptanesulfonic acid (PFHpS)	76.9	85.5	P/P	30 - 160
2299813	Perfluoroheptanoic acid (PFHpA)	94.7	81.4	P/P	30 - 160
2299813	Perfluorohexanesulfonic acid (PFHxS)	90.8	93.7	P/P	30 - 160
2299813	Perfluorohexanoic acid (PFHxA)	80.6	89.3	P/P	30 - 160
2299813	Perfluorononanesulfonic acid (PFNS)	83.4	76.8	P/P	30 - 160
2299813	Perfluorononanoic acid (PFNA)	89.6	81.1	P/P	30 - 160
2299813	Perfluorooctanesulfonic acid (PFOS)	96.0	96.1	P/P	30 - 160
2299813	Perfluorooctanoic acid (PFOA)	90.7	106	P/P	30 - 160
2299813	Perfluoropentanesulfonic acid (PFPeS)	102	99.4	P/P	30 - 160
2299813	Perfluoropentanoic acid (PFPeA)	102	83.9	P/P	30 - 160
2299813	Perfluoropropanesulfonic acid (PFPrS)	93.6	93.6	P/P	30 - 160
2299813	Perfluorotetradecanoic acid (PFTeA)	112	89.7	P/P	30 - 160
2299813	Perfluorotridecanoic acid (PFTriA)	119	97.7	P/P	30 - 160
2299813	Perfluoroundecanoic acid (PFUnA)	90.7	97.5	P/P	30 - 160

Quality Assurance Report Precision

Reference Method: DEP SOP: LC-001-3

Batch ID: P408265

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2299813	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	12.7	Spike	P	0 - 30
2299813	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	15.2	Spike	P	0 - 30
2299813	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	3.61	Spike	P	0 - 30
2299813	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	6.00	Spike	P	0 - 30
2299813	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	28.6	Spike	P	0 - 30
2299813	9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	14.4	Spike	P	0 - 30
2299813	Hexafluoropropylene oxide dimer acid (HFPO-DA)	20.5	Spike	P	0 - 30
2299813	N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	20.0	Spike	P	0 - 30
2299813	N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	1.52	Spike	P	0 - 30
2299813	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	5.22	Spike	P	0 - 30
2299813	Perfluoro-1-butane sulfonamide (FBSA)	7.98	Spike	P	0 - 30
2299813	Perfluoro-1-hexane sulfonamide (FHxSA)	9.80	Spike	P	0 - 30
2299813	Perfluoro-1-octane sulfonamide (FOSA)	5.98	Spike	P	0 - 30
2299813	Perfluoro-3-methoxypropanoic acid (PFMPA)	7.46	Spike	P	0 - 30
2299813	Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	7.94	Spike	P	0 - 30
2299813	Perfluoro-4-methoxybutanoic acid (PFMBA)	4.58	Spike	P	0 - 30
2299813	Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	6.38	Spike	P	0 - 30
2299813	Perfluorobutanesulfonic acid (PFBS)	9.66	Spike	P	0 - 30
2299813	Perfluorobutanoic acid (PFBA)	1.98	Spike	P	0 - 30
2299813	Perfluorodecanesulfonic acid (PFDS)	5.41	Spike	P	0 - 30
2299813	Perfluorodecanoic acid (PFDA)	19.3	Spike	P	0 - 30
2299813	Perfluorododecanoic acid (PFDoA)	18.8	Spike	P	0 - 30
2299813	Perfluoroheptanesulfonic acid (PFHpS)	10.6	Spike	P	0 - 30
2299813	Perfluoroheptanoic acid (PFHpA)	15.1	Spike	P	0 - 30
2299813	Perfluorohexanesulfonic acid (PFHxS)	3.14	Spike	P	0 - 30
2299813	Perfluorohexanoic acid (PFHxA)	10.2	Spike	P	0 - 30
2299813	Perfluorononanesulfonic acid (PFNS)	8.24	Spike	P	0 - 30
2299813	Perfluorononanoic acid (PFNA)	9.96	Spike	P	0 - 30
2299813	Perfluorooctanesulfonic acid (PFOS)	0.104	Spike	P	0 - 30
2299813	Perfluorooctanoic acid (PFOA)	15.4	Spike	P	0 - 30
2299813	Perfluoropentanesulfonic acid (PFPeS)	2.29	Spike	P	0 - 30
2299813	Perfluoropentanoic acid (PFPeA)	19.4	Spike	P	0 - 30
2299813	Perfluoropropanesulfonic acid (PFPrS)	0.0	Spike	P	0 - 30
2299813	Perfluorotetradecanoic acid (PFTeA)	21.9	Spike	P	0 - 30
2299813	Perfluorotridecanoic acid (PFTriA)	19.7	Spike	P	0 - 30
2299813	Perfluoroundecanoic acid (PFUnA)	7.23	Spike	P	0 - 30

* Sample, spike and/or laboratory control sample precision (LCS) is reported.

Quality Assurance Report Surrogates

Lab Sample ID: 2301157

Field Sample ID: SJR at Willow Branch

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
DEP SOP: LC-001-3	Hexafluoropropylene oxide dimer acid-13C	75.2	P	30 - 160
DEP SOP: LC-001-3	Perfluorobutanesulfonate-13C	113	P	30 - 160
DEP SOP: LC-001-3	Perfluorodecanoic acid-13C	134	P	30 - 160
DEP SOP: LC-001-3	Perfluorohexanesulfonate-13C	123	P	30 - 160
DEP SOP: LC-001-3	Perfluorohexanoic acid-13C	111	P	30 - 160

Lab Sample ID: 2301158

Field Sample ID: Field Blank

Reference Method	Surrogate	% Rec.	Pass/Fail	Control Limits
DEP SOP: LC-001-3	Hexafluoropropylene oxide dimer acid-13C	64.8	P	30 - 160
DEP SOP: LC-001-3	Perfluorobutanesulfonate-13C	120	P	30 - 160
DEP SOP: LC-001-3	Perfluorodecanoic acid-13C	129	P	30 - 160
DEP SOP: LC-001-3	Perfluorohexanesulfonate-13C	123	P	30 - 160
DEP SOP: LC-001-3	Perfluorohexanoic acid-13C	86.7	P	30 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: LC-001-3

Run ID: A110053

Included Lab Sample IDs: 2301157, 2301158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	84.4	94.6	P/P	60 - 160
11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	97.3	94.3	P/P	60 - 160
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	83.8	104	P/P	60 - 160
1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	90.9	98.7	P/P	60 - 160
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	84.9	94.8	P/P	60 - 160
1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	90.6	90.5	P/P	60 - 160
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	101	90.7	P/P	60 - 160
1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	122	114	P/P	60 - 160
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	101	117	P/P	60 - 160
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	85.5	138	P/P	60 - 160
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	104	100	P/P	60 - 160
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3ONS)	109	102	P/P	60 - 160
Hexafluoropropylene oxide dimer acid (HFPO-DA)	110	112	P/P	60 - 160
Hexafluoropropylene oxide dimer acid (HFPO-DA)	94.3	85.1	P/P	60 - 160
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	101	95.3	P/P	60 - 160
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	104	89.8	P/P	60 - 160
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	101	89.3	P/P	60 - 160
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	89.7	96.4	P/P	60 - 160
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	127	154	P/P	60 - 160
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	144	105	P/P	60 - 160
Perfluoro-1-butane sulfonamide (FBSA)	131	117	P/P	60 - 160
Perfluoro-1-butane sulfonamide (FBSA)	132	138	P/P	60 - 160
Perfluoro-1-hexane sulfonamide (FHxSA)	93.3	99.1	P/P	60 - 160
Perfluoro-1-hexane sulfonamide (FHxSA)	96.6	102	P/P	60 - 160
Perfluoro-1-octane sulfonamide (FOSA)	103	105	P/P	60 - 160
Perfluoro-1-octane sulfonamide (FOSA)	110	105	P/P	60 - 160
Perfluoro-3-methoxypropanoic acid (PFMPA)	108	116	P/P	60 - 160
Perfluoro-3-methoxypropanoic acid (PFMPA)	116	112	P/P	60 - 160
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	94.5	86.3	P/P	60 - 160
Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	98.1	78.8	P/P	60 - 160
Perfluoro-4-methoxybutanoic acid (PFMBA)	103	101	P/P	60 - 160
Perfluoro-4-methoxybutanoic acid (PFMBA)	98.8	117	P/P	60 - 160
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	105	107	P/P	60 - 160
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	113	110	P/P	60 - 160
Perfluorobutanesulfonic acid (PFBS)	96.5	118	P/P	60 - 160
Perfluorobutanesulfonic acid (PFBS)	98.6	93.1	P/P	60 - 160
Perfluorobutanoic acid (PFBA)	108	105	P/P	60 - 160
Perfluorobutanoic acid (PFBA)	108	105	P/P	60 - 160
Perfluorodecanesulfonic acid (PFDS)	93.1	96.8	P/P	60 - 160
Perfluorodecanesulfonic acid (PFDS)	97.7	99.8	P/P	60 - 160
Perfluorodecanoic acid (PFDA)	107	106	P/P	60 - 160
Perfluorodecanoic acid (PFDA)	123	102	P/P	60 - 160
Perfluorododecanoic acid (PFDoA)	91.3	90.1	P/P	60 - 160
Perfluorododecanoic acid (PFDoA)	95.6	98.3	P/P	60 - 160
Perfluoroheptanesulfonic acid (PFHpS)	83.6	89.5	P/P	60 - 160
Perfluoroheptanesulfonic acid (PFHpS)	92.8	76.1	P/P	60 - 160
Perfluoroheptanoic acid (PFHpA)	86.3	97.7	P/P	60 - 160
Perfluoroheptanoic acid (PFHpA)	94.2	95.3	P/P	60 - 160
Perfluorohexanesulfonic acid (PFHxS)	100	95.3	P/P	60 - 160
Perfluorohexanesulfonic acid (PFHxS)	102	91.1	P/P	60 - 160
Perfluorohexanoic acid (PFHxA)	90.0	98.8	P/P	60 - 160

Quality Assurance Report Calibration Verification

Reference Method: DEP SOP: LC-001-3

Run ID: A110053

Included Lab Sample IDs: 2301157, 2301158

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Perfluorohexanoic acid (PFHxA)	96.8	95.9	P/P	60 - 160
Perfluorononanesulfonic acid (PFNS)	106	110	P/P	60 - 160
Perfluorononanesulfonic acid (PFNS)	98.3	105	P/P	60 - 160
Perfluorononanoic acid (PFNA)	112	118	P/P	60 - 160
Perfluorononanoic acid (PFNA)	97.7	94.0	P/P	60 - 160
Perfluorooctanesulfonic acid (PFOS)	107	103	P/P	60 - 160
Perfluorooctanesulfonic acid (PFOS)	108	103	P/P	60 - 160
Perfluorooctanoic acid (PFOA)	112	117	P/P	60 - 160
Perfluorooctanoic acid (PFOA)	114	92.8	P/P	60 - 160
Perfluoropentanesulfonic acid (PFPeS)	89.0	105	P/P	60 - 160
Perfluoropentanesulfonic acid (PFPeS)	96.1	93.5	P/P	60 - 160
Perfluoropentanoic acid (PFPeA)	102	95.6	P/P	60 - 160
Perfluoropentanoic acid (PFPeA)	92.7	99.1	P/P	60 - 160
Perfluoropropanesulfonic acid (PFPrS)	115	122	P/P	60 - 160
Perfluoropropanesulfonic acid (PFPrS)	84.5	102	P/P	60 - 160
Perfluorotetradecanoic acid (PFTeA)	80.0	99.1	P/P	60 - 160
Perfluorotetradecanoic acid (PFTeA)	98.9	81.6	P/P	60 - 160
Perfluorotridecanoic acid (PFTriA)	115	131	P/P	60 - 160
Perfluorotridecanoic acid (PFTriA)	96.9	118	P/P	60 - 160
Perfluoroundecanoic acid (PFUnA)	108	127	P/P	60 - 160
Perfluoroundecanoic acid (PFUnA)	89.3	81.4	P/P	60 - 160

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery	LCS	Precision SMP	MS
DEP SOP: LC-001-3	11-Chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	69.4	53.4 47.0			12.7
	1H,1H,2H,2H-Perfluorodecane sulfonic acid (8:2FTS)	99.6	96.2 82.6			15.2
	1H,1H,2H,2H-Perfluorohexane sulfonic acid (4:2FTS)	91.1	87.0 90.2			3.61
	1H,1H,2H,2H-Perfluorooctane sulfonic acid (6:2FTS)	92.2	103 97.0			6.00
	4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	88.1	118 88.8			28.6
	9-Chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	90.3	74.7 86.3			14.4
	Hexafluoropropylene oxide dimer acid (HFPO-DA)	91.4	100 81.5			20.5
	N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)	89.6	93.8 115			20.0
	N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)	84.5	93.1 91.7			1.52
	Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	153	116 122			5.22
	Perfluoro-1-butane sulfonamide (FBSA)	152	147 136			7.98
	Perfluoro-1-hexane sulfonamide (FHxSA)	132	108 98.0			9.80
	Perfluoro-1-octane sulfonamide (FOSA)	98.4	103 97.3			5.98
	Perfluoro-3-methoxypropanoic acid (PFMPA)	103	110 102			7.46
	Perfluoro-4-ethylcyclohexanesulfonic acid (PFECHS)	83.6	75.0 81.2			7.94
	Perfluoro-4-methoxybutanoic acid (PFMBA)	96.9	104 109			4.58
	Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	101	112 105			6.38
	Perfluorobutanesulfonic acid (PFBS)	94.0	103 93.6			9.66
	Perfluorobutanoic acid (PFBA)	100	102 100			1.98
	Perfluorodecanesulfonic acid (PFDS)	88.3	60.7 57.5			5.41
	Perfluorodecanoic acid (PFDA)	81.6	98.8 81.4			19.3
	Perfluorododecanoic acid (PFDoA)	80.1	98.3 81.4			18.8
	Perfluoroheptanesulfonic acid (PFHpS)	75.3	76.9 85.5			10.6
	Perfluoroheptanoic acid (PFHpA)	87.0	94.7 81.4			15.1
	Perfluorohexanesulfonic acid (PFHxS)	93.3	90.8 93.7			3.14
	Perfluorohexanoic acid (PFHxA)	101	80.6 89.3			10.2
	Perfluorononanesulfonic acid (PFNS)	95.3	83.4 76.8			8.24
	Perfluorononanoic acid (PFNA)	93.2	89.6 81.1			9.96
	Perfluorooctanesulfonic acid (PFOS)	96.2	96.0 96.1			0.104
	Perfluorooctanoic acid (PFOA)	95.2	90.7 106			15.4
	Perfluoropentanesulfonic acid (PFPeS)	87.1	102 99.4			2.29
	Perfluoropentanoic acid (PFPeA)	92.6	102 83.9			19.4
	Perfluoropropanesulfonic acid (PFPrS)	88.5	93.6 93.6			0.0

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		Precision SMP	MS
			LCS	MS		
DEP SOP: LC-001-3	Perfluorotetradecanoic acid (PFTeA)	90.0	112	89.7		21.9
	Perfluorotridecanoic acid (PFTriA)	118	119	97.7		19.7
	Perfluoroundecanoic acid (PFUnA)	124	90.7	97.5		7.23

Reference Method Descriptions

Method	Description	Associated Samples
DEP SOP: LC-001-3	Perfluorinated alkyl substances in water matrices by HPLC/MS/MS	2301157, 2301158
SM 5540 C	MBAS in water (calculated as LAS, mol. wt. 340) by TestAmerica Pensacola.	2302845

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
DEP SOP: LC-001-3	01/21/2022	01/25/2022 09:00	Hoor Shaik	01/26/2022 09:14	Mohammad Ghaffari	2301158
	01/21/2022	01/25/2022 09:00	Hoor Shaik	01/26/2022 12:06	Mohammad Ghaffari	2301157
SM 5540 C	01/19/2022			01/20/2022 10:00	TestAmerica Pensacola	2302845